

# **Classification of the Vegetation Alliances and Associations of Sonoma County, California**

## **Volume 2 of 2 – Vegetation Descriptions**



*Prepared by:*

**California Department of Fish and Wildlife Vegetation Classification and Mapping Program  
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*For:*

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The Sonoma County Water Agency**

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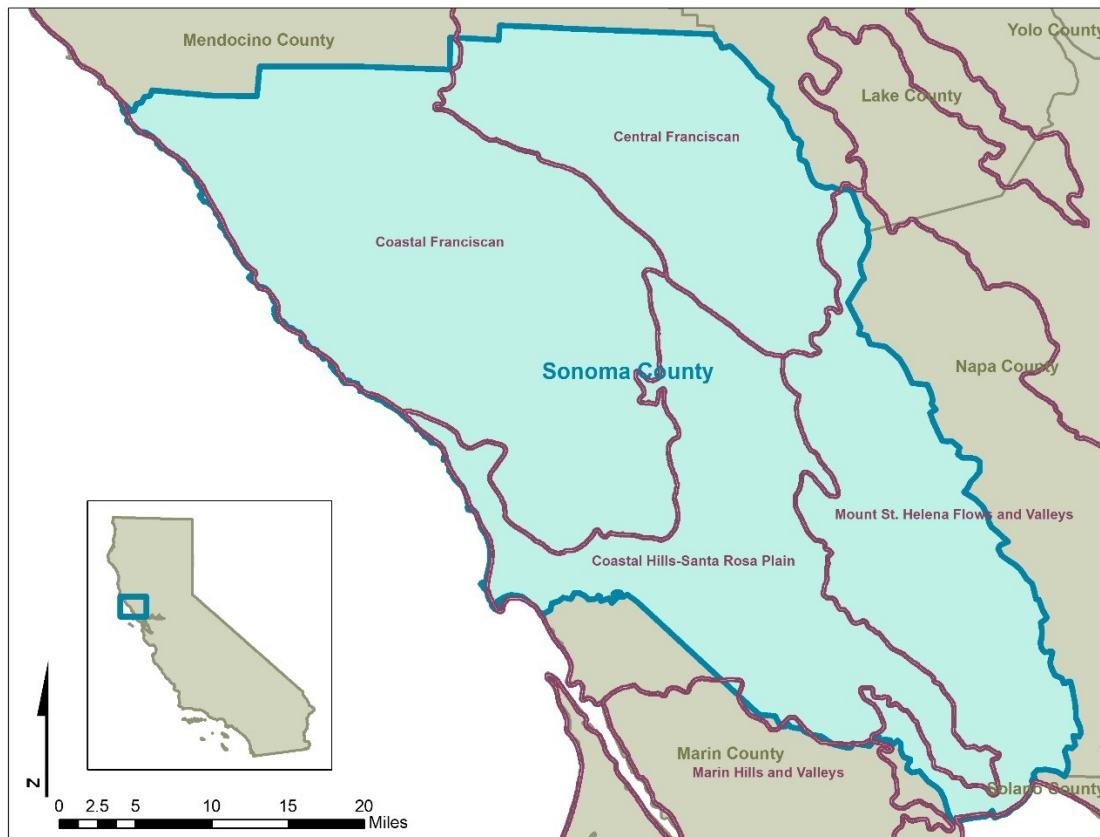
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## INTRODUCTION

This classification report describes 118 alliances and 212 associations that are found in Sonoma County, California, comprising the most comprehensive local vegetation classification to date. The report is divided into two volumes. Volume 1 is composed of the project introduction, methods, and results. It includes a floristic key to all vegetation types, a table showing the full local classification nested within the USNVC hierarchy, and a crosswalk showing the relationship between this and other classification systems. Volume 2 (this volume) provides descriptions of all vegetation alliances and associations. It summarizes distributional, structural, environmental, and plant species data for each type.

The vegetation type descriptions in this volume are divided into three sections based on dominance by trees, shrubs, and herbs; they are organized alphabetically by alliance within each section, with association-level descriptions located under the alliance they fall within hierarchically. Alliance descriptions begin with a statewide and local narrative, followed by a local summary of sample size, elevation, global and state ranking, list of related associations, vegetation layer information, slope, and surface cover. Graphical presentations of observed aspect, slope position, and soil texture are also included; darker shading indicates higher frequency of a variable within a category and lighter shading indicates lower frequency. Stand tables summarizing species composition by type show constancy and cover estimate values (average, minimum and maximum) for all taxa occurring in at least 20% of stands. Association descriptions, which are located directly under their related alliance, include similar local summary information with additional details such as the ecological subsections where they are found in Sonoma County (Figure 1), aspect, macrotopography, microtopography, parent material, and sample identification numbers. Graphical diagrams and summary narratives are not included for associations since many have sample sizes too low for broad generalization.



**Figure 1.** The four USDA ecological subsections in Sonoma County: Central Franciscan, Coastal Franciscan, Coastal Hills–Santa Rosa Plain, and Mount St. Helena Flows and Valleys.



## Definitions of terms used in vegetation descriptions

*Bare ground* – percent (exposed) cover of fine sediment or soil particles with a diameter less than 2 mm; i.e., ground that is not covered by litter, small rock, or large rock.

*Con / Avg / Min / Max* – the percent constancy of the species within all stands of the alliance or association; average, minimum, and maximum estimated percent cover of the species across all stands.

*Large rock* – percent cover of rocks on the ground with a diameter greater than 25 cm. Includes rocks that were recorded in the field as bedrock, boulder (>60 cm in diameter) and stone (>25 cm – 60 cm in diameter).

*Litter* – percent cover of litter, duff, and/or unattached wood on the ground.

*Macrotopography* – broad topographic term to describe general position of a stand in the surrounding watershed (e.g., top, upper third, middle third, lower third, and/or bottom).

*Microtopography* – term used to describe local topographic features or the lay of the area (e.g., surface is flat, concave, convex, undulating).

*Regenerating tree* – seedlings and saplings defined as follows:

*Seedlings* - trees clearly of a young age that have less than 1" diameter at breast height (dbh) or have not reached breast height. Applies only to trees propagating from seed; resprouts are not recorded here even if they meet the size requirements.

*Saplings* – trees with 1" – 6" dbh and young in age, OR small trees that are less than 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 greater than 6" dbh, then the re-sprouts would be recorded under the "Tree" stratum.

*SCV Global/State Rank* - The Survey of California Vegetation (SCV) uses the NatureServe's Heritage Program methodology defined for natural community conservation ranks as defined below (and see <http://www.natureserve.org>). "G" indicates the alliance's rarity and threat globally, and "S" indicates the alliance's rarity and threat in California. Ranks for alliances and associations in this classification were assigned by Todd Keeler-Wolf, Senior Vegetation Ecologist, with CDFW's VegCAMP.

G1/S1: Fewer than 6 viable occurrences worldwide/statewide, and/or up to 518 hectares

G2/S2: 6–20 viable occurrences worldwide/statewide, and/or more than 518–2,590 hectares

G3/S3: 21–100 viable occurrences worldwide/statewide, and/or more than 2,590–12,950 hectares

G4/S4: Greater than 100 viable occurrences worldwide/statewide, and/or more than 12,950 hectares

G5/S5: Demonstrably secure because of its worldwide/statewide abundance

Notes:

- If a vegetation type (i.e., alliance or association) is marked with a G1 through a G3 code, it is rare and threatened throughout its range. A type marked with a G5 and an S1 through an S3 code is secure through its range outside the state but is rare and threatened in California. A G4/S4 type may or may not be endemic to the state and is secure statewide.
- Semi-natural alliances and associations are not ranked.

*Small rock* – percent cover of rocks on the ground with a diameter ranging from 2 mm to 25 cm. Includes rocks that were recorded in the field as gravel (2 mm – 7.5 cm in diameter) and cobble (>7.5 cm – 25 cm in diameter).

*Species names and codes* – species names and codes are those defined in the PLANTS Database (USDA NRCS 2015), except in two cases. When a more current name has been assigned in *The Jepson Manual, second edition* (Baldwin et al. 2012), that name is frequently used and a code beginning with "2JM" is assigned. General vegetation types, such as moss and lichen, have codes beginning with the number 2 (e.g., 2MOSS).

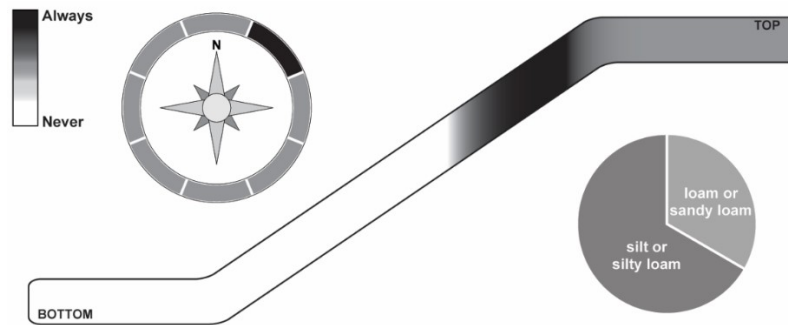
*Understory tree* – trees that grow beneath the main canopy of a forest/woodland.

### How to use the graphical representations

The graphs in each Local Alliance Summary represent observed aspect, topographic slope position, and soil texture. The five shades of gray in the scale to the left indicate the percentage of surveys having a particular attribute as follows:

- Black = 100% of surveys (Always)
- Dark gray = 67–99%
- Medium gray = 34–66%
- Light gray = 1–33%
- White = 0% (Never)

If a sampled vegetation stand occurs over more than one aspect or slope position, all aspects and positions are recorded. However, soil texture is taken in only one location. In the example below, the aspect was flat (all directions) in two of four surveys, and to the northeast in the other two surveys. Thus, the aspect was northeast 100% of the time, and that direction is shaded black. All other aspects occurred 50% of the time, so they are shaded medium gray. The slope position is similarly always at the upper third of the slope, but is occasionally also at the top.



## Tree Alliance Descriptions



This stand represents the *Hesperocyparis sargentii* Alliance. The photo was taken in mid-summer on the steep slopes of The Cedars conservation area.

---

## ***Abies grandis* Alliance**

### **Grand fir forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Abies grandis* is dominant or co-dominant in the tree canopy with *Alnus rubra*, *Picea sitchensis*, *Pinus muricata*, *Sequoia sempervirens*, and *Tsuga heterophylla*.

The *Abies grandis* Alliance is common in the Pacific Northwest; the southern limit of the species is Sonoma County (Griffin and Critchfield 1972). Infrequent in California, the alliance is limited to the north coastal strip, where logging has removed virtually all old-growth stands (Sawyer 2006, 2007). The few inventoried stands in Mendocino and Humboldt Counties are generally less than 20 hectares in size (CNDDDB). The alliance does not contain stands with *Abies grandis* × *concolor* hybrids found at montane elevations in the northern Coast Ranges and western Klamath Mountains (Hunt 1993, Sawyer 2006, 2007); those are included in the *Abies concolor* Alliance.

Stands of *Abies grandis* in California appear mostly seaward of the *Sequoia sempervirens* belt. The alliance's proximity to the coast, with its maritime temperatures and summer fog, yields conditions similar to those of the *Picea sitchensis* Alliance. However, unlike *P. sitchensis* stands, those of *A. grandis* occupy only upland settings, typically on mesic slopes above creeks and river mouths.

#### Sonoma County

Stands in Sonoma County are rare; only one was accessible on public land. However, at least one other *Abies grandis* stand exists uphill from the access road to the Gualala River campground off Highway 1 (Keeler-Wolf, personal observation). Trees in this stand are significantly larger than those in the sampled stand at Salt Point State Park.

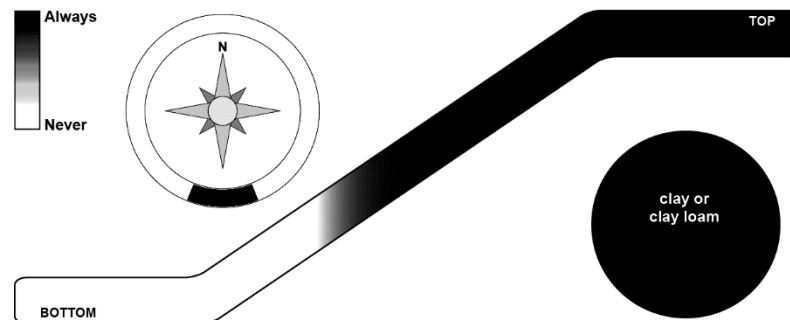
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#### **Local Alliance Summary (n = 1)**

**Elevation:** 319 ft

**SCV Global/State Rank:** G4/S2<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.0         | 55            | –          |
| <b>Herb</b>                          | 1.0          | 1             | 0.5–1      |
| <b>Shrub</b>                         | 3.0          | 3             | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 3.0          | 3             | 1–2        |
| <b>Hardwood</b>                      | 1.0          | 1             | 2–5        |
| <b>Conifer</b>                       | 55.0         | 55            | 20–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 3.0%  | 3%    |
| <b>Litter cover</b>      | 95.0% | 95%   |

**Associations within this Alliance:** none

**STAND TABLE**

***Abies grandis* Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name                        | Con | Avg  | Min  | Max  |
|--|--------|---------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                       |     |      |      |      |
|  | ABGR   | <i>Abies grandis</i>                  | 100 | 48.0 | 48.0 | 48.0 |
|  | PIMU   | <i>Pinus muricata</i>                 | 100 | 9.0  | 9.0  | 9.0  |
|  | SESE3  | <i>Sequoia sempervirens</i>           | 100 | 5.0  | 5.0  | 5.0  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i> | 100 | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |                                       |     |      |      |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i> | 100 | 3.0  | 3.0  | 3.0  |
| <b>Shrub</b>                           |        |                                       |     |      |      |      |
|  | GAULT  | <i>Gaultheria</i>                     | 100 | 3.0  | 3.0  | 3.0  |
|  | VAOV2  | <i>Vaccinium ovatum</i>               | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |                                       |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>            | 100 | 1.0  | 1.0  | 1.0  |
|  | CABU   | <i>Calypso bulbosa</i>                | 100 | 0.2  | 0.2  | 0.2  |
|  | COMA25 | <i>Corallorhiza maculata</i>          | 100 | 0.2  | 0.2  | 0.2  |
|  | GOODY  | <i>Goodyera</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|  | HIERO  | <i>Hierochloa</i>                     | 100 | 0.2  | 0.2  | 0.2  |
|  | TROV2  | <i>Trillium ovatum</i>                | 100 | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

---

## ***Acer macrophyllum* Alliance**

### **Bigleaf maple forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Acer macrophyllum* is dominant or co-dominant in the tree canopy with *Abies concolor*, *Alnus rhombifolia*, *Alnus rubra*, *Calocedrus decurrens*, *Cornus nuttallii*, *Picea sitchensis*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Quercus kelloggii*, *Quercus lobata*, *Sequoia sempervirens*, *Taxus brevifolia*, and *Umbellularia californica*.

This alliance occurs in habitats with different moisture regimes, from moist stream terraces to dry talus, but it attains its best development on deep alluvial soils. The best developed stands are scattered along alluvial river terraces, in adjacent side drainages, and at springs along slopes. The species is extremely flood tolerant; it is the only hardwood encountered commonly at low elevation in Pacific Northwest coniferous forests in both steep upland slopes and riparian habitats. At the southern portion of its range, in southern and central California, it is usually riparian (Minore and Zasada 1990, Uchytel 1989a).

#### Sonoma County

Most *Acer macrophyllum* stands in Sonoma County are consistent with this description.

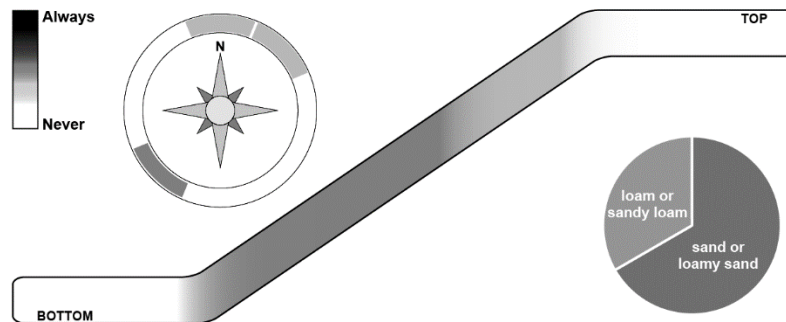
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#### **Local Alliance Summary (n = 5)**

**Elevation:** 626–1606 ft, mean 1132 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 57.4         | 46–74         | –          |
| <b>Herb</b>                          | 7.2          | 3–15          | <0.5–2     |
| <b>Shrub</b>                         | 4.2          | 0–10          | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 7.0          | 2–22          | 2–15       |
| <b>Hardwood</b>                      | 42.8         | 20–60         | 10–20      |
| <b>Conifer</b>                       | 7.0          | 0–30          | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 30.8° | 20–40° |
| <b>Large rock cover</b>  | 8.6%  | 0–18%  |
| <b>Small rock cover</b>  | 21.0% | 6–42%  |
| <b>Bare ground cover</b> | 26.4% | 15–35% |
| <b>Litter cover</b>      | 42.2% | 24–55% |

**Associations within this Alliance:**

*Acer macrophyllum* Association

**STAND TABLE**

***Acer macrophyllum* Alliance**

n = 5

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|--|-------|---------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                       |     |      |      |      |
|  | ACMA3 | * <i>Acer macrophyllum</i>            | 100 | 29.2 | 15.0 | 45.0 |
|  | UMCA  | * <i>Umbellularia californica</i>     | 100 | 5.0  | 1.0  | 8.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 60  | 11.7 | 0.2  | 30.0 |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 60  | 4.7  | 3.0  | 6.0  |
|  | ARME  | * <i>Arbutus menziesii</i>            | 40  | 8.5  | 2.0  | 15.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>            | 40  | 1.5  | 1.0  | 2.0  |
|  | FRLA  | * <i>Fraxinus latifolia</i>           | 20  | 19.0 | 19.0 | 19.0 |
|  | QUCH2 | * <i>Quercus chrysolepis</i>          | 20  | 15.0 | 15.0 | 15.0 |
|  | QUKE  | <i>Quercus kelloggii</i>              | 20  | 2.0  | 2.0  | 2.0  |
|  | AECA  | <i>Aesculus californica</i>           | 20  | 0.2  | 0.2  | 0.2  |
|  | 2SNAG | Standing snag                         | 20  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |      |      |
|  | ACMA3 | * <i>Acer macrophyllum</i>            | 100 | 3.5  | 0.2  | 13.0 |
|  | UMCA  | * <i>Umbellularia californica</i>     | 80  | 2.9  | 0.2  | 8.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 80  | 0.5  | 0.2  | 1.0  |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 60  | 0.8  | 0.2  | 1.2  |
|  | QUCH2 | * <i>Quercus chrysolepis</i>          | 40  | 0.7  | 0.2  | 1.2  |
|  | SESE3 | <i>Sequoia sempervirens</i>           | 40  | 0.6  | 0.2  | 1.0  |
|  | ARME  | * <i>Arbutus menziesii</i>            | 40  | 0.3  | 0.2  | 0.4  |
|  | QUAG  | * <i>Quercus agrifolia</i>            | 40  | 0.2  | 0.2  | 0.2  |
|  | FRLA  | * <i>Fraxinus latifolia</i>           | 20  | 0.4  | 0.4  | 0.4  |
|  | ALRH2 | <i>Alnus rhombifolia</i>              | 20  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Acer macrophyllum* Alliance**

n = 5

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                               | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Shrub</b>    | TODI        | <i>Toxicodendron diversilobum</i>                   | 60         | 2.1        | 0.2        | 5.0        |
|                 | HEAR5       | <i>Heteromeles arbutifolia</i>                      | 40         | 1.0        | 1.0        | 1.0        |
|                 | DIAUA       | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 20         | 10.0       | 10.0       | 10.0       |
|                 | SYAL        | <i>Symphoricarpos albus</i>                         | 20         | 3.0        | 3.0        | 3.0        |
|                 | ROCA2       | <i>Rosa californica</i>                             | 20         | 1.0        | 1.0        | 1.0        |
|                 | VICA5       | <i>Vitis californica</i>                            | 20         | 1.0        | 1.0        | 1.0        |
|                 | CAOC5       | <i>Calycanthus occidentalis</i>                     | 20         | 0.2        | 0.2        | 0.2        |
|                 | HODI        | <i>Holodiscus discolor</i>                          | 20         | 0.2        | 0.2        | 0.2        |
|                 | RULE        | <i>Rubus leucodermis</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                 | SANIC5      | <i>Sambucus nigra</i> ssp. <i>cerulea</i>           | 20         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>     | DRAR3       | <i>Dryopteris arguta</i>                            | 60         | 1.3        | 1.0        | 2.0        |
|                 | PETR7       | <i>Pentagramma triangularis</i>                     | 60         | 0.2        | 0.2        | 0.2        |
|                 | BRLA3       | <i>Bromus laevipes</i>                              | 40         | 0.2        | 0.2        | 0.2        |
|                 | ELGL        | <i>Elymus glaucus</i>                               | 40         | 0.2        | 0.2        | 0.2        |
|                 | POMU        | <i>Polystichum munitum</i>                          | 40         | 0.2        | 0.2        | 0.2        |
|                 | ADJO        | <i>Adiantum jordanii</i>                            | 20         | 6.0        | 6.0        | 6.0        |
|                 | BRDI2       | <i>Brachypodium distachyon</i>                      | 20         | 4.0        | 4.0        | 4.0        |
|                 | POLYP       | <i>Polypodium</i>                                   | 20         | 3.0        | 3.0        | 3.0        |
|                 | LAVE2       | <i>Lathyrus vestitus</i>                            | 20         | 2.0        | 2.0        | 2.0        |
|                 | WOFI        | <i>Woodwardia fimbriata</i>                         | 20         | 2.0        | 2.0        | 2.0        |
|                 | METO        | <i>Melica torreyana</i>                             | 20         | 1.0        | 1.0        | 1.0        |
|                 | PEAN2       | <i>Pellaea andromedifolia</i>                       | 20         | 1.0        | 1.0        | 1.0        |
|                 | WHMO        | <i>Whipplea modesta</i>                             | 20         | 1.0        | 1.0        | 1.0        |
|                 | ARIST2      | <i>Aristolochia</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                 | BRDI3       | <i>Bromus diandrus</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                 | CAPY2       | <i>Carduus pycnocephalus</i>                        | 20         | 0.2        | 0.2        | 0.2        |
|                 | CAREX       | <i>Carex</i>  | 20         | 0.2        | 0.2        | 0.2        |
|                 | CAGL7       | <i>Carex globosa</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>                     | 20         | 0.2        | 0.2        | 0.2        |
|                 | FECA        | <i>Festuca californica</i>                          | 20         | 0.2        | 0.2        | 0.2        |
|                 | GAUS        | <i>Gamochaeta ustulata</i>                          | 20         | 0.2        | 0.2        | 0.2        |
|                 | HEUCH       | <i>Heuchera</i>                                     | 20         | 0.2        | 0.2        | 0.2        |
|                 | HIERA       | <i>Hieracium</i>                                    | 20         | 0.2        | 0.2        | 0.2        |
|                 | HIAL2       | <i>Hieracium albiflorum</i>                         | 20         | 0.2        | 0.2        | 0.2        |
|                 | MAIAN       | <i>Maianthemum</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                 | MELIC       | <i>Melica</i>                                       | 20         | 0.2        | 0.2        | 0.2        |
|                 | MEGE        | <i>Melica geyeri</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                 | POCA12      | <i>Polypodium californicum</i>                      | 20         | 0.2        | 0.2        | 0.2        |
|                 | POLYS       | <i>Polystichum</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                 | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 20         | 0.2        | 0.2        | 0.2        |
|                 | STACH       | <i>Stachys</i>                                      | 20         | 0.2        | 0.2        | 0.2        |
|                 | TOLMI       | <i>Tolmiea</i>                                      | 20         | 0.2        | 0.2        | 0.2        |
|                 | TORIL       | <i>Torilis</i>                                      | 20         | 0.2        | 0.2        | 0.2        |

**STAND TABLE** continued

***Acer macrophyllum* Alliance**

n = 5

| Lifeform            | Code   | Botanical Name | Con | Avg | Min | Max  |
|---------------------|--------|----------------|-----|-----|-----|------|
| <b>Non-vascular</b> |        |                |     |     |     |      |
|                     | 2MOSS  | Moss           | 100 | 9.2 | 1.0 | 15.0 |
|                     | 2LICHN | Lichen         | 20  | 0.2 | 0.2 | 0.2  |

***Acer macrophyllum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (2), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 57.4         | 46–74         | –          |
| <b>Herb</b>                          | 7.2          | 3–15          | <0.5–2     |
| <b>Shrub</b>                         | 4.2          | 0–10          | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 7.0          | 2–22          | 2–15       |
| <b>Hardwood</b>                      | 42.8         | 20–60         | 10–20      |
| <b>Conifer</b>                       | 7.0          | 0–30          | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SW (2), variable (1)

**Macrotopography:** lower 1/3 of slope (2), middle 1/3 of slope (2), upper 1/3 of slope (1)

**Microtopography:** concave (4), undulating (1)

**Parent material:** Franciscan melange (1), mixed alluvium (1), sandstone (1), sandy alluvium (1), volcanic (1)

**Soil texture:** loam or sandy loam (1), sand (2)

**Slope steepness:** moderate/6-25° (1), steep/>25° (4)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 1132 ft | 626–1606 ft |
| <b>Slope</b>             | 30.8°   | 20–40°      |
| <b>Large rock cover</b>  | 8.6%    | 0–18%       |
| <b>Small rock cover</b>  | 21.0%   | 6–42%       |
| <b>Bare ground cover</b> | 26.4%   | 15–35%      |
| <b>Litter cover</b>      | 42.2%   | 24–55%      |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0192, SONO0335, SONO0689, SONO0872, SONO2024

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Acer macrophyllum* Association**

n = 5

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                               | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>                            |             |   |            |            |            |            |
|  | ACMA3       | * <i>Acer macrophyllum</i>                          | 100        | 29.2       | 15.0       | 45.0       |
|  | UMCA        | * <i>Umbellularia californica</i>                   | 100        | 5.0        | 1.0        | 8.0        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                      | 60         | 11.7       | 0.2        | 30.0       |
|  | NODE3       | * <i>Notholithocarpus densiflorus</i>               | 60         | 4.7        | 3.0        | 6.0        |
|  | ARME        | * <i>Arbutus menziesii</i>                          | 40         | 8.5        | 2.0        | 15.0       |
|  | QUAG        | * <i>Quercus agrifolia</i>                          | 40         | 1.5        | 1.0        | 2.0        |
|  | FRLA        | * <i>Fraxinus latifolia</i>                         | 20         | 19.0       | 19.0       | 19.0       |
|  | QUCH2       | * <i>Quercus chrysolepis</i>                        | 20         | 15.0       | 15.0       | 15.0       |
|  | QUKE        | <i>Quercus kelloggii</i>                            | 20         | 2.0        | 2.0        | 2.0        |
|  | AECA        | <i>Aesculus californica</i>                         | 20         | 0.2        | 0.2        | 0.2        |
|  | 2SNAG       | Standing snag                                       | 20         | 0.2        | 0.2        | 0.2        |
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | ACMA3       | * <i>Acer macrophyllum</i>                          | 100        | 3.5        | 0.2        | 13.0       |
|  | UMCA        | * <i>Umbellularia californica</i>                   | 80         | 2.9        | 0.2        | 8.0        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                      | 80         | 0.5        | 0.2        | 1.0        |
|  | NODE3       | * <i>Notholithocarpus densiflorus</i>               | 60         | 0.8        | 0.2        | 1.2        |
|  | QUCH2       | * <i>Quercus chrysolepis</i>                        | 40         | 0.7        | 0.2        | 1.2        |
|  | SESE3       | <i>Sequoia sempervirens</i>                         | 40         | 0.6        | 0.2        | 1.0        |
|  | ARME        | * <i>Arbutus menziesii</i>                          | 40         | 0.3        | 0.2        | 0.4        |
|  | QUAG        | * <i>Quercus agrifolia</i>                          | 40         | 0.2        | 0.2        | 0.2        |
|  | FRLA        | * <i>Fraxinus latifolia</i>                         | 20         | 0.4        | 0.4        | 0.4        |
|  | ALRH2       | <i>Alnus rhombifolia</i>                            | 20         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i>                   | 60         | 2.1        | 0.2        | 5.0        |
|  | HEAR5       | <i>Heteromeles arbutifolia</i>                      | 40         | 1.0        | 1.0        | 1.0        |
|  | DIAUA       | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 20         | 10.0       | 10.0       | 10.0       |
|  | SYAL        | <i>Symphoricarpos albus</i>                         | 20         | 3.0        | 3.0        | 3.0        |
|  | VICA5       | <i>Vitis californica</i>                            | 20         | 1.0        | 1.0        | 1.0        |
|  | ROCA2       | <i>Rosa californica</i>                             | 20         | 1.0        | 1.0        | 1.0        |
|  | SANIC5      | <i>Sambucus nigra</i> ssp. <i>cerulea</i>           | 20         | 0.2        | 0.2        | 0.2        |
|  | RULE        | <i>Rubus leucodermis</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|  | CAOC5       | <i>Calycanthus occidentalis</i>                     | 20         | 0.2        | 0.2        | 0.2        |
|  | HODI        | <i>Holodiscus discolor</i>                          | 20         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | DRAR3       | <i>Dryopteris arguta</i>                            | 60         | 1.3        | 1.0        | 2.0        |
|  | PETR7       | <i>Pentagramma triangularis</i>                     | 60         | 0.2        | 0.2        | 0.2        |
|  | BRLA3       | <i>Bromus laevipes</i>                              | 40         | 0.2        | 0.2        | 0.2        |
|  | ELGL        | <i>Elymus glaucus</i>                               | 40         | 0.2        | 0.2        | 0.2        |
|  | POMU        | <i>Polystichum munitum</i>                          | 40         | 0.2        | 0.2        | 0.2        |
|  | ADJO        | <i>Adiantum jordanii</i>                            | 20         | 6.0        | 6.0        | 6.0        |
|  | BRDI2       | <i>Brachypodium distachyon</i>                      | 20         | 4.0        | 4.0        | 4.0        |
|  | POLYP       | <i>Polypodium</i>                                   | 20         | 3.0        | 3.0        | 3.0        |
|  | WOFI        | <i>Woodwardia fimbriata</i>                         | 20         | 2.0        | 2.0        | 2.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Acer macrophyllum* Association**

n = 5

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         | LAVE2       | <i>Lathyrus vestitus</i>                         | 20         | 2.0        | 2.0        | 2.0        |
|                     | WHMO        | <i>Whipplea modesta</i>                          | 20         | 1.0        | 1.0        | 1.0        |
|                     | METO        | <i>Melica torreyana</i>                          | 20         | 1.0        | 1.0        | 1.0        |
|                     | PEAN2       | <i>Pellaea andromedifolia</i>                    | 20         | 1.0        | 1.0        | 1.0        |
|                     | HEUCH       | <i>Heuchera</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                     | TORIL       | <i>Torilis</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | TOLMI       | <i>Tolmiea</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | STACH       | <i>Stachys</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 20         | 0.2        | 0.2        | 0.2        |
|                     | POLYS       | <i>Polystichum</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                     | POCA12      | <i>Polypodium californicum</i>                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | MEGE        | <i>Melica geyeri</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                     | MELIC       | <i>Melica</i>                                    | 20         | 0.2        | 0.2        | 0.2        |
|                     | MAIAN       | <i>Maianthemum</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                     | HIAL2       | <i>Hieracium albiflorum</i>                      | 20         | 0.2        | 0.2        | 0.2        |
|                     | GAUS        | <i>Gamochaeta ustulata</i>                       | 20         | 0.2        | 0.2        | 0.2        |
|                     | FECA        | <i>Festuca californica</i>                       | 20         | 0.2        | 0.2        | 0.2        |
|                     | CHPO3       | <i>Chlorogalum pomeridianum</i>                  | 20         | 0.2        | 0.2        | 0.2        |
|                     | CAGL7       | <i>Carex globosa</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                     | CAREX       | <i>Carex</i>                                     | 20         | 0.2        | 0.2        | 0.2        |
|                     | CAPY2       | <i>Carduus pycnocephalus</i>                     | 20         | 0.2        | 0.2        | 0.2        |
|                     | BRDI3       | <i>Bromus diandrus</i>                           | 20         | 0.2        | 0.2        | 0.2        |
|                     | ARIST2      | <i>Aristolochia</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                     | HIERA       | <i>Hieracium</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 100        | 9.2        | 1.0        | 15.0       |
|                     | 2LICHN      | Lichen   | 20         | 0.2        | 0.2        | 0.2        |

***Acer negundo* Alliance**  
**Box-elder forest**

Statewide (Sawyer et al. 2009)

*Acer negundo* is dominant or co-dominant in the tree canopy with *Alnus rhombifolia*, *Fraxinus latifolia*, *Juglans hindsii*, *Juglans hindsii* × *regia*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Quercus lobata*, *Salix gooddingii*, and *Salix* spp.

In California, this alliance is mainly limited to riparian zones of major streams and rivers that are regularly flooded. Individual trees often occur as an understory component in stands of *Populus fremontii*, *Quercus lobata*, and *Salix gooddingii* Alliances. *Acer negundo* stands may result from removal of the overstory trees in stands of those alliances. The *Acer negundo* Alliance is rare in the state, where small stands form and sometimes are monospecific.

Sonoma County

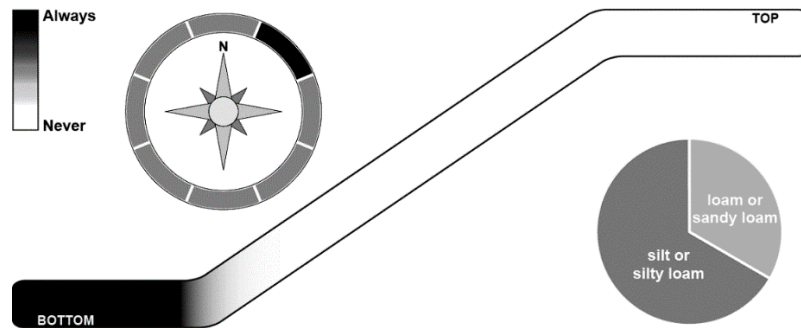
In Sonoma County, *Acer negundo* stands are found along the Russian River and the Laguna de Santa Rosa, adjacent to other riparian woody vegetation.

**Local Alliance Summary (n = 3)**

**Elevation:** 40–61 ft, mean 52 ft

**SCV Global/State Rank:** G5/S2<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 74.0         | 55–95         | –          |
| <b>Herb</b>                          | 3.5          | 0–10          | <0.5–1     |
| <b>Shrub</b>                         | 46.7         | 3–85          | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 16.3         | 2–24          | 1–5        |
| <b>Hardwood</b>                      | 38.0         | 22–65         | 5–15       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 1.0°  | 0–2°   |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.1%  | 0–0.2% |
| Bare ground cover | 5.3%  | 0–13%  |
| Litter cover      | 90.0% | 85–95% |

Associations within this Alliance: none

**STAND TABLE**

**Acer negundo Alliance**

n = 3

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | ACNE2  | * <i>Acer negundo</i>                            | 100 | 28.3 | 7.0  | 60.0 |
|  | SALA3  | <i>Salix laevigata</i>                           | 67  | 5.5  | 3.0  | 8.0  |
|  | FRLA   | <i>Fraxinus latifolia</i>                        | 33  | 12.0 | 12.0 | 12.0 |
|  | POFR2  | <i>Populus fremontii</i>                         | 33  | 6.0  | 6.0  | 6.0  |
|  | JUHI   | * <i>Juglans hindsii</i>                         | 33  | 5.0  | 5.0  | 5.0  |
|  | SALUL  | <i>Salix lucida</i> ssp. <i>lasiandra</i>        | 33  | 5.0  | 5.0  | 5.0  |
|  | SALIX  | <i>Salix</i>                                     | 33  | 1.0  | 1.0  | 1.0  |
|  | PRUNU  | <i>Prunus</i>                                    | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | ACNE2  | * <i>Acer negundo</i>                            | 100 | 12.7 | 2.0  | 24.0 |
|  | JUHI   | * <i>Juglans hindsii</i>                         | 33  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | RUBUS  | <i>Rubus</i>                                     | 67  | 40.1 | 0.2  | 80.0 |
|  | RUAR9  | <i>Rubus armeniacus</i>                          | 67  | 20.5 | 5.0  | 36.0 |
|  | RUUR   | <i>Rubus ursinus</i>                             | 33  | 2.0  | 2.0  | 2.0  |
|  | VICA5  | <i>Vitis californica</i>                         | 33  | 1.0  | 1.0  | 1.0  |
|  | COSE16 | <i>Cornus sericea</i>                            | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | HEHE   | <i>Hedera helix</i>                              | 33  | 19.0 | 19.0 | 19.0 |
|  | POPUP4 | <i>Polygonum punctatum</i> var. <i>punctatum</i> | 33  | 8.0  | 8.0  | 8.0  |
|  | OESA   | <i>Oenanthе sarmentosa</i>                       | 33  | 1.0  | 1.0  | 1.0  |
|  | URDI   | <i>Urtica dioica</i>                             | 33  | 1.0  | 1.0  | 1.0  |
|  | ALLA2  | <i>Alisma lanceolatum</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|  | BIFR   | <i>Bidens frondosa</i>                           | 33  | 0.2  | 0.2  | 0.2  |
|  | BRDI3  | <i>Bromus diandrus</i>                           | 33  | 0.2  | 0.2  | 0.2  |
|  | COMA2  | <i>Conium maculatum</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | CYER   | <i>Cyperus eragrostis</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|  | LEOR   | <i>Leersia oryzoides</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|  | MEPU   | <i>Mentha pulegium</i>                           | 33  | 0.2  | 0.2  | 0.2  |
|  | PHAR3  | <i>Phalaris arundinacea</i>                      | 33  | 0.2  | 0.2  | 0.2  |
|  | RUMEX  | <i>Rumex</i>                                     | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Aesculus californica* Alliance**  
**California buckeye groves**

Statewide (Sawyer et al. 2009)

*Aesculus californica* is dominant or co-dominant in the tree canopy with *Fraxinus dipetala*, *Heteromeles arbutifolia*, *Pinus sabiniana*, *Prunus ilicifolia*, *Quercus wislizeni*, and *Umbellularia californica*.

Stands tend to be small and often occur in relatively mesic concavities inland or on steep lower to mid slopes in coastal areas. They intermix with stands of many chaparral and woodland alliances at low elevations.

Sonoma County

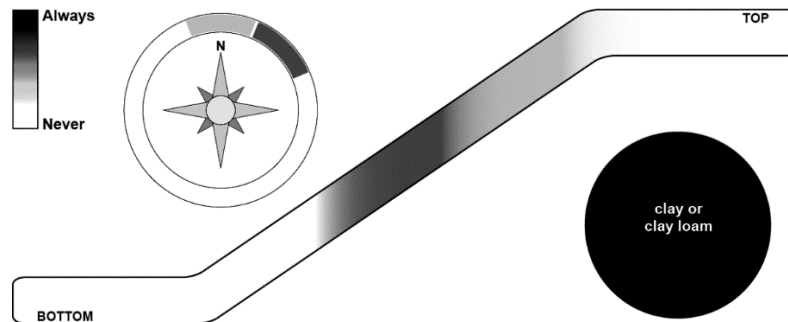
*Aesculus californica* stands in Sonoma County are located inland from the main summer fog belt and are most common in the vicinity of Lake Sonoma, where they are usually found on rocky concave slopes.

**Local Alliance Summary (n = 3)**

**Elevation:** 551–1553 ft, mean 952 ft

**SCV Global/State Rank:** G3/S3

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 36.3         | 35–38         | –          |
| <b>Herb</b>                          | 21.0         | 5–30          | <0.5–1     |
| <b>Shrub</b>                         | 1.7          | 0.2–3         | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2–0.2       | <0.5–1     |
| <b>Hardwood</b>                      | 21.0         | 6–30          | 2–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                         | Mean  | Range |
|-------------------------|-------|-------|
| <b>Slope</b>            | 18.0° | 18°   |
| <b>Large rock cover</b> | 2.5%  | 0–5%  |



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Small rock cover  | 19.4% | 5–38%  |
| Bare ground cover | 38.0% | 10–74% |
| Litter cover      | 38.7% | 20–70% |

**Associations within this Alliance:**

*Aesculus californica* / *Toxicodendron diversilobum* / Moss Association

**STAND TABLE**

***Aesculus californica* Alliance**

n = 3

| Lifeform                               | Code   | Botanical Name                                    | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | AECA   | <i>Aesculus californica</i>                       | 100 | 21.0 | 6.0  | 30.0 |
|  | QUAG   | * <i>Quercus agrifolia</i>                        | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                        | 67  | 0.3  | 0.2  | 0.4  |
|  | QUGA4  | <i>Quercus garryana</i>                           | 33  | 0.2  | 0.2  | 0.2  |
|  | UMCA   | <i>Umbellularia californica</i>                   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                 | 67  | 1.1  | 0.2  | 2.0  |
|  | CECU   | <i>Ceanothus cuneatus</i>                         | 33  | 2.0  | 2.0  | 2.0  |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                    | 33  | 0.2  | 0.2  | 0.2  |
|  | BAPI   | <i>Baccharis pilularis</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|  | CEFO   | <i>Ceanothus foliosus</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                    | 33  | 0.2  | 0.2  | 0.2  |
|  | QUBE5  | <i>Quercus berberidifolia</i>                     | 33  | 0.2  | 0.2  | 0.2  |
|  | RULE   | <i>Rubus leucodermis</i>                          | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | TOAR   | <i>Torilis arvensis</i>                           | 67  | 0.2  | 0.2  | 0.2  |
|  | BRMA   | <i>Briza maxima</i>                               | 33  | 25.0 | 25.0 | 25.0 |
|  | BRDI3  | <i>Bromus diandrus</i>                            | 33  | 8.0  | 8.0  | 8.0  |
|  | AVBA   | <i>Avena barbata</i>                              | 33  | 5.0  | 5.0  | 5.0  |
|  | CLPE   | <i>Claytonia perfoliata</i>                       | 33  | 3.0  | 3.0  | 3.0  |
|  | GAAP2  | <i>Galium aparine</i>                             | 33  | 3.0  | 3.0  | 3.0  |
|  | RAOC   | <i>Ranunculus occidentalis</i>                    | 33  | 3.0  | 3.0  | 3.0  |
|  | CYEC   | <i>Cynosurus echinatus</i>                        | 33  | 2.0  | 2.0  | 2.0  |
|  | ACMI2  | <i>Achillea millefolium</i>                       | 33  | 1.0  | 1.0  | 1.0  |
|  | AVENA  | <i>Avena</i>                                      | 33  | 1.0  | 1.0  | 1.0  |
|  | CYNOS2 | <i>Cynosurus</i>                                  | 33  | 1.0  | 1.0  | 1.0  |
|  | ELYMU  | <i>Elymus</i>                                     | 33  | 1.0  | 1.0  | 1.0  |
|  | NEMEM  | <i>Nemophila menziesii</i> var. <i>menziesii</i>  | 33  | 1.0  | 1.0  | 1.0  |
|  | PLMA4  | <i>Plectritis macrocera</i>                       | 33  | 1.0  | 1.0  | 1.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 33  | 1.0  | 1.0  | 1.0  |
|  | SACR2  | <i>Sanicula crassicaulis</i>                      | 33  | 1.0  | 1.0  | 1.0  |
|  | VILA2  | <i>Vicia lathyroides</i>                          | 33  | 1.0  | 1.0  | 1.0  |
|  | ADJO   | <i>Adiantum jordanii</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | AMMEI2 | <i>Amsinckia menziesii</i> var. <i>intermedia</i> | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Aesculus californica* Alliance**

n = 3

| Lifeform     | Code   | Botanical Name                  | Con | Avg | Min | Max  |
|--------------|--------|---------------------------------|-----|-----|-----|------|
| Herb         |        |                                 |     |     |     |      |
|              | ANAR   | <i>Anagallis arvensis</i>       | 33  | 0.2 | 0.2 | 0.2  |
|              | BROMU  | <i>Bromus</i>                   | 33  | 0.2 | 0.2 | 0.2  |
|              | CAPY2  | <i>Carduus pycnocephalus</i>    | 33  | 0.2 | 0.2 | 0.2  |
|              | CIVU   | <i>Cirsium vulgare</i>          | 33  | 0.2 | 0.2 | 0.2  |
|              | COSP   | <i>Collinsia sparsiflora</i>    | 33  | 0.2 | 0.2 | 0.2  |
|              | DENU   | <i>Delphinium nudicaule</i>     | 33  | 0.2 | 0.2 | 0.2  |
|              | DICHE2 | <i>Dichelostemma</i>            | 33  | 0.2 | 0.2 | 0.2  |
|              | ELGL   | <i>Elymus glaucus</i>           | 33  | 0.2 | 0.2 | 0.2  |
|              | GEMO   | <i>Geranium molle</i>           | 33  | 0.2 | 0.2 | 0.2  |
|              | JUPA2  | <i>Juncus patens</i>            | 33  | 0.2 | 0.2 | 0.2  |
|              | LIAF   | <i>Lithophragma affine</i>      | 33  | 0.2 | 0.2 | 0.2  |
|              | MADIA  | <i>Madia</i>                    | 33  | 0.2 | 0.2 | 0.2  |
|              | MECA2  | <i>Melica californica</i>       | 33  | 0.2 | 0.2 | 0.2  |
|              | MEGE   | <i>Melica geyeri</i>            | 33  | 0.2 | 0.2 | 0.2  |
|              | MEPU   | <i>Mentha pulegium</i>          | 33  | 0.2 | 0.2 | 0.2  |
|              | NEHE   | <i>Nemophila heterophylla</i>   | 33  | 0.2 | 0.2 | 0.2  |
|              | PETR7  | <i>Pentagramma triangularis</i> | 33  | 0.2 | 0.2 | 0.2  |
|              | RUMEX  | <i>Rumex</i>                    | 33  | 0.2 | 0.2 | 0.2  |
|              | SAME7  | <i>Saxifraga mertensiana</i>    | 33  | 0.2 | 0.2 | 0.2  |
|              | THCU   | <i>Thysanocarpus curvipes</i>   | 33  | 0.2 | 0.2 | 0.2  |
|              | TRIFO  | <i>Trifolium</i>                | 33  | 0.2 | 0.2 | 0.2  |
| Non-vascular |        |                                 |     |     |     |      |
|              | 2MOSS  | Moss                            | 100 | 8.0 | 1.0 | 15.0 |
|              | 2LICHN | Lichen                          | 67  | 0.2 | 0.2 | 0.2  |

***Aesculus californica* / *Toxicodendron diversilobum* / Moss Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Franciscan/263Ag (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 36.3         | 35–38         | –          |
| <b>Herb</b>                          | 21.0         | 5–30          | <0.5–1     |
| <b>Shrub</b>                         | 1.7          | 0.2–3         | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2–0.2       | <0.5–1     |
| <b>Hardwood</b>                      | 21.0         | 6–30          | 2–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (1)

**Macrotopography:** middle 1/3 of slope (2), upper 1/3 of slope (1)

**Microtopography:** concave (1), undulating (2)

**Parent material:** Franciscan melange (1), greenstone (1), sedimentary (1)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data, continued**

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6-25° (2), steep/>25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 952 ft. | 551–1553 ft. |
| <b>Slope</b>             | 18.0°   | 18–18°       |
| <b>Large rock cover</b>  | 2.5%    | 0–5%         |
| <b>Small rock cover</b>  | 19.4%   | 5–38%        |
| <b>Bare ground cover</b> | 38.0%   | 10–74%       |
| <b>Litter cover</b>      | 38.7%   | 20–70%       |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0079, SONO0358, SONO0839

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Aesculus californica* / *Toxicodendron diversilobum* / Moss Association**

n = 3

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | AECA  | <i>Aesculus californica</i>       | 100 | 21.0 | 6.0  | 30.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 67  | 0.3  | 0.2  | 0.4  |
|  | QUGA4 | <i>Quercus garryana</i>           | 33  | 0.2  | 0.2  | 0.2  |
|  | UMCA  | <i>Umbellularia californica</i>   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 67  | 1.1  | 0.2  | 2.0  |
|  | CECU  | <i>Ceanothus cuneatus</i>         | 33  | 2.0  | 2.0  | 2.0  |
|  | ADFA  | <i>Adenostoma fasciculatum</i>    | 33  | 0.2  | 0.2  | 0.2  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 33  | 0.2  | 0.2  | 0.2  |
|  | CEFO  | <i>Ceanothus foliosus</i>         | 33  | 0.2  | 0.2  | 0.2  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 33  | 0.2  | 0.2  | 0.2  |
|  | QUBE5 | <i>Quercus berberidifolia</i>     | 33  | 0.2  | 0.2  | 0.2  |
|  | RULE  | <i>Rubus leucodermis</i>          | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | TOAR  | <i>Torilis arvensis</i>           | 67  | 0.2  | 0.2  | 0.2  |
|  | BRMA  | <i>Briza maxima</i>               | 33  | 25.0 | 25.0 | 25.0 |
|  | BRDI3 | <i>Bromus diandrus</i>            | 33  | 8.0  | 8.0  | 8.0  |
|  | AVBA  | <i>Avena barbata</i>              | 33  | 5.0  | 5.0  | 5.0  |
|  | CLPE  | <i>Claytonia perfoliata</i>       | 33  | 3.0  | 3.0  | 3.0  |
|  | GAAP2 | <i>Galium aparine</i>             | 33  | 3.0  | 3.0  | 3.0  |
|  | RAOC  | <i>Ranunculus occidentalis</i>    | 33  | 3.0  | 3.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Aesculus californica* / *Toxicodendron diversilobum* / Moss Association**

n = 3

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>         |             |   |            |            |            |            |
|                     | CYEC        | <i>Cynosurus echinatus</i>                        | 33         | 2.0        | 2.0        | 2.0        |
|                     | PLMA4       | <i>Plectritis macrocera</i>                       | 33         | 1.0        | 1.0        | 1.0        |
|                     | VILA2       | <i>Vicia lathyroides</i>                          | 33         | 1.0        | 1.0        | 1.0        |
|                     | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 33         | 1.0        | 1.0        | 1.0        |
|                     | NEMEM       | <i>Nemophila menziesii</i> var. <i>menziesii</i>  | 33         | 1.0        | 1.0        | 1.0        |
|                     | CYNOS2      | <i>Cynosurus</i>                                  | 33         | 1.0        | 1.0        | 1.0        |
|                     | AVENA       | <i>Avena</i>                                      | 33         | 1.0        | 1.0        | 1.0        |
|                     | ACMI2       | <i>Achillea millefolium</i>                       | 33         | 1.0        | 1.0        | 1.0        |
|                     | ELYMU       | <i>Elymus</i>                                     | 33         | 1.0        | 1.0        | 1.0        |
|                     | SACR2       | <i>Sanicula crassicaulis</i>                      | 33         | 1.0        | 1.0        | 1.0        |
|                     | SAME7       | <i>Saxifraga mertensiana</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | MADIA       | <i>Madia</i>                                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | MECA2       | <i>Melica californica</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                     | MEGE        | <i>Melica geyeri</i>                              | 33         | 0.2        | 0.2        | 0.2        |
|                     | MEPU        | <i>Mentha pulegium</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                     | NEHE        | <i>Nemophila heterophylla</i>                     | 33         | 0.2        | 0.2        | 0.2        |
|                     | RUMEX       | <i>Rumex</i>                                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | THCU        | <i>Thysanocarpus curvipes</i>                     | 33         | 0.2        | 0.2        | 0.2        |
|                     | TRIFO       | <i>Trifolium</i>                                  | 33         | 0.2        | 0.2        | 0.2        |
|                     | GEMO        | <i>Geranium molle</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                     | PETR7       | <i>Pentagramma triangularis</i>                   | 33         | 0.2        | 0.2        | 0.2        |
|                     | LIAF        | <i>Lithophragma affine</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|                     | ELGL        | <i>Elymus glaucus</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                     | DICHE2      | <i>Dichelostemma</i>                              | 33         | 0.2        | 0.2        | 0.2        |
|                     | DENU        | <i>Delphinium nudicaule</i>                       | 33         | 0.2        | 0.2        | 0.2        |
|                     | COSP        | <i>Collinsia sparsiflora</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | CIVU        | <i>Cirsium vulgare</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                     | CAPY2       | <i>Carduus pycnocephalus</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | BROMU       | <i>Bromus</i>                                     | 33         | 0.2        | 0.2        | 0.2        |
|                     | ANAR        | <i>Anagallis arvensis</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                     | AMMEI2      | <i>Amsinckia menziesii</i> var. <i>intermedia</i> | 33         | 0.2        | 0.2        | 0.2        |
|                     | ADJO        | <i>Adiantum jordanii</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                     | JUPA2       | <i>Juncus patens</i>                              | 33         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |   |            |            |            |            |
|                     | 2MOSS       | Moss  | 100        | 8.0        | 1.0        | 15.0       |
|                     | 2LICHN      | Lichen  | 67         | 0.2        | 0.2        | 0.2        |

***Alnus rhombifolia* Alliance**  
**White alder groves**

Statewide (Sawyer et al. 2009)

*Alnus rhombifolia* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Chamaecyparis lawsoniana*, *Fraxinus latifolia*, *Notholithocarpus densiflorus*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Pseudotsuga menziesii*, *Quercus lobata*, and *Salix* spp.

*Alnus rhombifolia* stands primarily occur in inland foothills and lower montane zones, usually as narrow strips along perennial stream courses throughout cismontane California. *Alnus rhombifolia* is well adapted to many flood regimes. Stands exist usually on seasonally flooded stream banks and channel bars just at or below the bank full level, but they occur sometimes in intermittently flooded floodplains and rarely in permanently saturated seeps. Flooding typically comes from winter floods and spring runoff.

Sonoma County

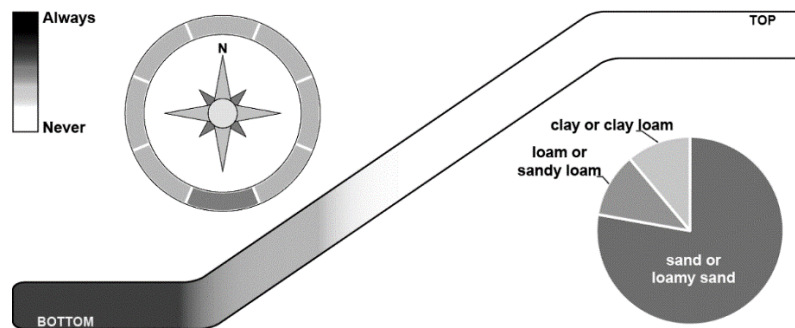
Sonoma County stands may occur close to the coast and overlap to some degree with *Alnus rubra* stands. Species determination should be made carefully in any stands within about five miles of the ocean. Stands of *Alnus* with species composition similar to typical Sonoma County *Alnus rubra* stands (e.g., with *Sambucus racemosa*, *Rubus spectabilis*, and other species restricted to coastal riparian areas) are classified as part of the *Alnus rubra* Alliance.

**Local Alliance Summary (n = 21)**

**Elevation:** 33–1575 ft, mean 466 ft

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 59.7         | 25–92         | –          |
| <b>Herb</b>             | 7.2          | 1–16          | <0.5–2     |
| <b>Shrub</b>            | 15.7         | 0.2–70        | <0.5–10    |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 4.6          | 0–17          | <0.5–10    |
| Hardwood                      | 43.9         | 15–76         | 5–35       |
| Conifer                       | 0.8          | 0–3           | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 4.2°  | 0–20° |
| Large rock cover  | 18.0% | 0–55% |
| Small rock cover  | 30.9% | 0–61% |
| Bare ground cover | 15.5% | 2–45% |
| Litter cover      | 22.2% | 2–87% |

**Associations within this Alliance:**

*Alnus rhombifolia* – *Acer macrophyllum* Association  
*Alnus rhombifolia* / *Carex (nudata)* Association  
*Alnus rhombifolia* Association

**STAND TABLE**

***Alnus rhombifolia* Alliance**

n = 21

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | ALRH2 | * <i>Alnus rhombifolia</i>        | 100 | 30.9 | 5.0 | 70.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 62  | 12.6 | 0.2 | 30.0 |
|  | ACMA3 | * <i>Acer macrophyllum</i>        | 43  | 7.6  | 0.2 | 25.0 |
|  | FRLA  | * <i>Fraxinus latifolia</i>       | 24  | 1.1  | 0.2 | 2.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 24  | 1.1  | 0.2 | 3.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | ALRH2 | * <i>Alnus rhombifolia</i>        | 81  | 3.6  | 0.2 | 16.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 57  | 1.3  | 0.2 | 5.2  |
|  | FRLA  | * <i>Fraxinus latifolia</i>       | 38  | 0.8  | 0.2 | 2.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 38  | 0.6  | 0.2 | 1.2  |
|  | ACMA3 | * <i>Acer macrophyllum</i>        | 24  | 2.4  | 0.2 | 10.0 |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 71  | 0.8  | 0.2 | 4.0  |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 43  | 5.6  | 1.0 | 30.0 |
|  | RUUR  | <i>Rubus ursinus</i>              | 38  | 15.5 | 0.2 | 50.0 |
|  | CAOC5 | <i>Calycanthus occidentalis</i>   | 38  | 5.4  | 0.2 | 30.0 |
|  | VICA5 | <i>Vitis californica</i>          | 38  | 1.7  | 0.2 | 5.0  |
|  | SASI2 | <i>Salix sitchensis</i>           | 24  | 6.1  | 0.2 | 13.0 |
|  | SYAL  | <i>Symphoricarpos albus</i>       | 24  | 2.4  | 0.2 | 5.0  |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | CAREX | <i>Carex</i>                      | 38  | 4.5  | 1.0 | 11.0 |
|  | CANU5 | <i>Carex nudata</i>               | 38  | 3.3  | 0.2 | 10.0 |
|  | WOFI  | <i>Woodwardia fimbriata</i>       | 38  | 0.9  | 0.2 | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Alnus rhombifolia* Alliance**

n = 21

| Lifeform     | Code  | Botanical Name | Con | Avg | Min | Max  |
|--------------|-------|----------------|-----|-----|-----|------|
| Non-vascular |       |                |     |     |     |      |
|              | 2MOSS | Moss           | 86  | 5.5 | 0.2 | 28.0 |

***Alnus rhombifolia* – *Acer macrophyllum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (4), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 65.3         | 40–90         | –          |
| Herb                          | 4.3          | 1–8           | <0.5–2     |
| Shrub                         | 12.5         | 0.2–35        | 0.5–5      |
| Regenerating/understory tree* | 4.1          | 0–16          | <0.5–10    |
| Hardwood                      | 52.3         | 33–76         | 10–35      |
| Conifer                       | 0.6          | 0–2           | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (1), SW (3), variable (3)

**Macrotopography:** bottom (5), bottom to lower 1/3 of slope (1), lower 1/3 of slope (2)

**Microtopography:** concave (5), convex (1), undulating (1)

**Parent material:** andesite (1), basalt (1), greenstone (1), mixed alluvium (1), siltstone (1), silty alluvium (1), volcanic (2)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1), sand (3)

**Slope steepness:** gentle/1-5° (5), moderate/6-25° (3)

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 596 ft. | 160–1575 ft. |
| Slope             | 6.9°    | 2–20°        |
| Large rock cover  | 21.3%   | 0–55%        |
| Small rock cover  | 27.6%   | 6–53%        |
| Bare ground cover | 16.1%   | 2–40%        |
| Litter cover      | 24.6%   | 3–78%        |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** MILOB004, SONO0196, SONO0610, SONO0629, SONO0646, SONO0685, SONO0804, SONO0838

**Relevés:** none

**SCV Global/State Rank:** G3?/S3<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**STAND TABLE**

***Alnus rhombifolia* – *Acer macrophyllum* Association**

n = 8

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Tree</b>                            |             |                                   |            |            |            |            |
|  | ALRH2       | * <i>Alnus rhombifolia</i>        | 100        | 27.8       | 5.0        | 70.0       |
|  | UMCA        | * <i>Umbellularia californica</i> | 88         | 16.3       | 0.2        | 30.0       |
|  | ACMA3       | * <i>Acer macrophyllum</i>        | 88         | 9.6        | 1.0        | 25.0       |
|  | QUCH2       | <i>Quercus chrysolepis</i>        | 38         | 1.4        | 0.2        | 2.0        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>    | 38         | 0.7        | 0.2        | 1.0        |
|  | FRLA        | * <i>Fraxinus latifolia</i>       | 25         | 1.1        | 0.2        | 2.0        |
|  | AECA        | <i>Aesculus californica</i>       | 25         | 0.6        | 0.2        | 1.0        |
| <b>Regenerating or Understory Tree</b> |             |                                   |            |            |            |            |
|  | UMCA        | * <i>Umbellularia californica</i> | 88         | 0.8        | 0.2        | 3.0        |
|  | ALRH2       | * <i>Alnus rhombifolia</i>        | 75         | 1.7        | 0.2        | 5.2        |
|  | ACMA3       | * <i>Acer macrophyllum</i>        | 63         | 2.4        | 0.2        | 10.0       |
|  | PSME        | * <i>Pseudotsuga menziesii</i>    | 63         | 0.6        | 0.2        | 1.2        |
|  | FRLA        | * <i>Fraxinus latifolia</i>       | 38         | 1.5        | 0.4        | 2.0        |
|  | QUAG        | <i>Quercus agrifolia</i>          | 25         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |                                   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i> | 100        | 1.0        | 0.2        | 4.0        |
|  | RUAR9       | <i>Rubus armeniacus</i>           | 75         | 2.2        | 1.0        | 5.0        |
|  | CAOC5       | <i>Calycanthus occidentalis</i>   | 50         | 10.3       | 0.2        | 30.0       |
|  | VICA5       | <i>Vitis californica</i>          | 38         | 2.3        | 1.0        | 5.0        |
|  | SYAL        | <i>Symphoricarpos albus</i>       | 38         | 2.1        | 0.2        | 5.0        |
|  | RUUR        | <i>Rubus ursinus</i>              | 38         | 0.5        | 0.2        | 1.0        |
|  | ARCA10      | <i>Aristolochia californica</i>   | 25         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |                                   |            |            |            |            |
|  | WOFI        | <i>Woodwardia fimbriata</i>       | 63         | 0.7        | 0.2        | 2.0        |
|  | CANU5       | <i>Carex nudata</i>               | 38         | 1.7        | 0.2        | 3.0        |
|  | ARCA2       | <i>Aralia californica</i>         | 25         | 10.5       | 3.0        | 18.0       |
|  | CAREX       | <i>Carex</i>                      | 25         | 3.0        | 1.0        | 5.0        |
|  | POMU        | <i>Polystichum munitum</i>        | 25         | 0.6        | 0.2        | 1.0        |
|  | POLYP       | <i>Polypodium</i>                 | 25         | 0.2        | 0.2        | 0.2        |
|  | PRHO2       | <i>Prosartes hookeri</i>          | 25         | 0.2        | 0.2        | 0.2        |
|  | STAJ        | <i>Stachys ajugoides</i>          | 25         | 0.2        | 0.2        | 0.2        |
|  | PETR7       | <i>Pentagramma triangularis</i>   | 25         | 0.2        | 0.2        | 0.2        |
|  | MICA3       | <i>Mimulus cardinalis</i>         | 25         | 0.2        | 0.2        | 0.2        |
|  | ADJO        | <i>Adiantum jordanii</i>          | 25         | 0.2        | 0.2        | 0.2        |
|  | DRAR3       | <i>Dryopteris arguta</i>          | 25         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b>                    |             |                                   |            |            |            |            |
|  | 2MOSS       | Moss                              | 88         | 8.5        | 0.2        | 28.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Alnus rhombifolia* / *Carex (nudata)* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (8), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.4         | 25–78         | –          |
| <b>Herb</b>                          | 8.8          | 1–16          | <0.5–1     |
| <b>Shrub</b>                         | 14.1         | 0.2–70        | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 4.8          | 0.2–17        | <0.5–10    |
| <b>Hardwood</b>                      | 35.3         | 15–70         | 5–35       |
| <b>Conifer</b>                       | 0.8          | 0–3           | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (2), SW (2), variable (1)

**Macrotopography:** bottom (11)

**Microtopography:** concave (9), flat (1)

**Parent material:** Franciscan melange (3), sandstone (5), sedimentary (1), volcanic (2)

**Soil texture:** sand (4)

**Slope steepness:** gentle/1-5° (8)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 449 ft. | 185–652 ft. |
| <b>Slope</b>             | 2.3°    | 1–5°        |
| <b>Large rock cover</b>  | 18.8%   | 0–50%       |
| <b>Small rock cover</b>  | 35.7%   | 7–61%       |
| <b>Bare ground cover</b> | 12.8%   | 3–26%       |
| <b>Litter cover</b>      | 16.2%   | 2–54%       |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** SONO0087, SONO0176, SONO0311, SONO0587, SONO0903, SONO0947, SONO0948, SONO0952, SONO0953, SONO0982, SONO1109

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Alnus rhombifolia* / *Carex (nudata)* Association**

n = 11

| Lifeform | Code  | Botanical Name             | Con | Avg  | Min  | Max  |
|----------|-------|----------------------------|-----|------|------|------|
| Tree     | ALRH2 | * <i>Alnus rhombifolia</i> | 100 | 30.2 | 13.0 | 60.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Alnus rhombifolia* / *Carex (nudata)* Association**

n = 11

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 45  | 5.8  | 0.2 | 17.0 |
|  | SESE3 | <i>Sequoia sempervirens</i>       | 27  | 2.0  | 1.0 | 3.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | ALRH2 | * <i>Alnus rhombifolia</i>        | 91  | 4.6  | 0.2 | 16.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 36  | 1.1  | 0.2 | 2.0  |
|  | FRLA  | <i>Fraxinus latifolia</i>         | 36  | 0.5  | 0.2 | 1.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 55  | 0.6  | 0.2 | 2.0  |
|  | VICA5 | <i>Vitis californica</i>          | 45  | 1.3  | 0.2 | 4.0  |
|  | RUUR  | <i>Rubus ursinus</i>              | 27  | 20.7 | 0.2 | 32.0 |
|  | SASI2 | <i>Salix sitchensis</i>           | 27  | 7.7  | 0.2 | 13.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 27  | 1.4  | 0.2 | 3.0  |
|  | CAOC5 | <i>Calycanthus occidentalis</i>   | 27  | 0.5  | 0.2 | 1.0  |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | CAREX | <i>Carex</i>                      | 55  | 5.0  | 1.0 | 11.0 |
|  | CANU5 | <i>Carex nudata</i>               | 45  | 4.2  | 1.0 | 10.0 |
|  | WOFI  | <i>Woodwardia fimbriata</i>       | 27  | 1.1  | 0.2 | 3.0  |
|  | SCMI2 | <i>Scirpus microcarpus</i>        | 27  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |       |                                   |     |      |     |      |
|  | 2MOSS | Moss                              | 91  | 3.9  | 0.2 | 9.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Alnus rhombifolia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 83.5         | 75–92         | –          |
| <b>Herb</b>                          | 10.0         | 5–15          | 0.5–2      |
| <b>Shrub</b>                         | 37.5         | 25–50         | 1–2        |
| <b>Regenerating/understory tree*</b> | 6.0          | 0–12          | 5–10       |
| <b>Hardwood</b>                      | 57.5         | 40–75         | 5–10       |
| <b>Conifer</b>                       | 1.0          | 0–2           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), SW (1)

**Macrotopography:** bottom (2)

**Microtopography:** concave (1), flat (1)

**Parent material:** Franciscan melange (2)

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**Summary of Environmental Data, continued**

**Soil texture:** no data (2)

**Slope steepness:** flat/0° (1), gentle/1-5° (1)

|                          | Mean   | Range     |
|--------------------------|--------|-----------|
| <b>Elevation</b>         | 46 ft. | 33–59 ft. |
| <b>Slope</b>             | 1.0°   | 0–2°      |
| <b>Large rock cover</b>  | 0.1%   | 0–0.2%    |
| <b>Small rock cover</b>  | 17.1%  | 0–34%     |
| <b>Bare ground cover</b> | 27.5%  | 10–45%    |
| <b>Litter cover</b>      | 46.0%  | 5–87%     |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0095, SONO0977

**Relevés:** none

**SCV Global/State Rank:** G4/S4?<sup>1</sup>

**STAND TABLE**

***Alnus rhombifolia* Association**

n = 2

| Lifeform                               | Code   | Botanical Name                            | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | ALRH2  | * <i>Alnus rhombifolia</i>                | 100 | 47.5 | 40.0 | 55.0 |
|  | UMCA   | * <i>Umbellularia californica</i>         | 50  | 20.0 | 20.0 | 20.0 |
|  | FRLA   | * <i>Fraxinus latifolia</i>               | 50  | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>         | 50  | 5.2  | 5.2  | 5.2  |
|  | ALRH2  | * <i>Alnus rhombifolia</i>                | 50  | 5.2  | 5.2  | 5.2  |
|  | PSME   | <i>Pseudotsuga menziesii</i>              | 50  | 1.0  | 1.0  | 1.0  |
|  | SESE3  | <i>Sequoia sempervirens</i>               | 50  | 1.0  | 1.0  | 1.0  |
|  | FRLA   | * <i>Fraxinus latifolia</i>               | 50  | 0.2  | 0.2  | 0.2  |
|  | TOCA   | <i>Torreya californica</i>                | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>                      | 100 | 30.0 | 10.0 | 50.0 |
|  | RUSP   | <i>Rubus spectabilis</i>                  | 50  | 8.0  | 8.0  | 8.0  |
|  | SALA6  | <i>Salix lasiolepis</i>                   | 50  | 8.0  | 8.0  | 8.0  |
|  | SASI2  | <i>Salix sitchensis</i>                   | 50  | 7.0  | 7.0  | 7.0  |
|  | RUAR9  | <i>Rubus armeniacus</i>                   | 50  | 5.0  | 5.0  | 5.0  |
|  | RIBES  | <i>Ribes</i>                              | 50  | 0.2  | 0.2  | 0.2  |
|  | TODI   | <i>Toxicodendron diversilobum</i>         | 50  | 0.2  | 0.2  | 0.2  |
|  | CAOC5  | <i>Calycanthus occidentalis</i>           | 50  | 0.2  | 0.2  | 0.2  |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | RULE   | <i>Rubus leucodermis</i>                  | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Alnus rhombifolia* Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                              |            |            |            |            |
|                     | URDI        | <i>Urtica dioica</i>         | 100        | 7.0        | 2.0        | 12.0       |
|                     | COMA2       | <i>Conium maculatum</i>      | 100        | 0.2        | 0.2        | 0.2        |
|                     | EQHY        | <i>Equisetum hyemale</i>     | 50         | 3.0        | 3.0        | 3.0        |
|                     | POMU        | <i>Polystichum munitum</i>   | 50         | 2.0        | 2.0        | 2.0        |
|                     | ATFI        | <i>Athyrium filix-femina</i> | 50         | 1.0        | 1.0        | 1.0        |
|                     | ARDO3       | <i>Artemisia douglasiana</i> | 50         | 0.2        | 0.2        | 0.2        |
|                     | CIRSI       | <i>Cirsium</i>               | 50         | 0.2        | 0.2        | 0.2        |
|                     | DRAR3       | <i>Dryopteris arguta</i>     | 50         | 0.2        | 0.2        | 0.2        |
|                     | EQUIS       | <i>Equisetum</i>             | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                              |            |            |            |            |
|                     | 2MOSS       | Moss                         | 50         | 2.0        | 2.0        | 2.0        |

***Alnus rubra* Alliance**  
**Red alder forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Alnus rubra* is dominant or co-dominant in the tree canopy with *Abies grandis*, *Garrya elliptica*, *Picea sitchensis*, *Populus trichocarpa*, *Pseudotsuga menziesii*, *Salix hookeriana*, *Salix lasiolepis*, *Salix sitchensis*, *Sequoia sempervirens*, *Tsuga heterophylla*, and *Umbellularia californica*.

In California, the *Alnus rubra* Alliance occurs as both riparian and upland stands, primarily near the coast. Stands typically include a well-developed shrub understory of species such as *Rubus spectabilis*, *R. ursinus*, and *Sambucus racemosa* (Cheng 2004, Keeler-Wolf et al. 2003a, Evens and Kentner 2006). From Mendocino County northward, *Alnus rubra* stands were much more restricted in the past, occurring chiefly along streams or natural landslides; today, however, seedlings and stands of *Alnus rubra* easily establish in upland areas that have been recently logged (Sawyer 2006).

Sonoma County

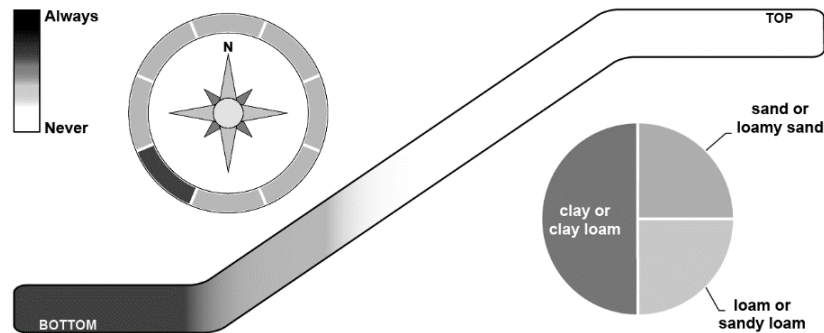
In the southern portion of its range in Sonoma County, *Alnus rubra* stands are still largely restricted to coastal riparian settings. Please see comments in the *A. rhombifolia* description for issues of alder identification near the coast.

**Local Alliance Summary (n = 14)**

**Elevation:** 6–201 ft, mean 89 ft

**SCV Global/State Rank:** G5/S4<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 73.9         | 42–98         | –          |
| <b>Herb</b>             | 18.4         | 2–42          | <0.5–2     |
| <b>Shrub</b>            | 26.1         | 6–77          | 0.5–5      |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 3.0          | 0–25          | 0.5–15     |
| Hardwood                      | 49.6         | 22–78         | 2–35       |
| Conifer                       | 2.2          | 0–15          | 2–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 2.7°  | 0–8°  |
| Large rock cover  | 2.0%  | 0–19% |
| Small rock cover  | 15.4% | 0–60% |
| Bare ground cover | 11.4% | 0–35% |
| Litter cover      | 66.1% | 5–95% |

**Associations within this Alliance:**

*Alnus rubra* / *Rubus* spp. Provisional Association

**STAND TABLE**

***Alnus rubra* Alliance**

n = 14

| Lifeform                               | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | ALRU2  | * <i>Alnus rubra</i>                           | 100 | 45.1 | 12.0 | 75.0 |
|  | SESE3  | <i>Sequoia sempervirens</i>                    | 50  | 1.8  | 0.2  | 5.0  |
|  | UMCA   | * <i>Umbellularia californica</i>              | 29  | 6.6  | 0.2  | 15.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                 | 21  | 6.1  | 0.2  | 15.0 |
|  | FRLA   | * <i>Fraxinus latifolia</i>                    | 21  | 0.5  | 0.2  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | ALRU2  | * <i>Alnus rubra</i>                           | 64  | 4.1  | 0.2  | 25.0 |
|  | FRLA   | * <i>Fraxinus latifolia</i>                    | 29  | 0.8  | 0.2  | 2.2  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                 | 21  | 0.5  | 0.2  | 1.2  |
|  | UMCA   | * <i>Umbellularia californica</i>              | 21  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>                           | 79  | 13.1 | 0.2  | 40.0 |
|  | RUPA   | <i>Rubus parviflorus</i>                       | 64  | 3.6  | 0.2  | 10.0 |
|  | RUSP   | <i>Rubus spectabilis</i>                       | 36  | 17.6 | 1.0  | 30.0 |
|  | SASI2  | <i>Salix sitchensis</i>                        | 36  | 2.5  | 0.2  | 8.0  |
|  | RUAR9  | <i>Rubus armeniacus</i>                        | 29  | 11.5 | 1.0  | 29.0 |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i>      | 21  | 8.3  | 1.0  | 13.0 |
|  | SARAR3 | <i>Sambucus racemosa</i> var. <i>racemosa</i>  | 21  | 3.5  | 0.2  | 10.0 |
|  | PHCA11 | <i>Physocarpus capitatus</i>                   | 21  | 0.8  | 0.2  | 2.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                     | 21  | 0.5  | 0.2  | 1.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i> | 21  | 0.5  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>                     | 86  | 6.3  | 0.2  | 20.0 |
|  | URDI   | <i>Urtica dioica</i>                           | 50  | 8.3  | 0.2  | 41.0 |
|  | ATFI   | <i>Athyrium filix-femina</i>                   | 50  | 2.0  | 1.0  | 5.0  |
|  | EQUIS  | <i>Equisetum</i>                               | 50  | 0.9  | 0.2  | 4.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Alnus rubra* Alliance**

n = 14

| Lifeform     | Code  | Botanical Name                                 | Con | Avg | Min | Max  |
|--------------|-------|--|-----|-----|-----|------|
| Herb         |       |  |     |     |     |      |
|              | PEFRP | <i>Petasites frigidus</i> var. <i>palmatus</i> | 29  | 0.9 | 0.2 | 3.0  |
|              | HOLA  | <i>Holcus lanatus</i>                          | 21  | 4.1 | 0.2 | 10.0 |
|              | ARDO3 | <i>Artemisia douglasiana</i>                   | 21  | 1.1 | 0.2 | 3.0  |
|              | CAREX | <i>Carex</i>                                   | 21  | 0.5 | 0.2 | 1.0  |
|              | CYER  | <i>Cyperus eragrostis</i>                      | 21  | 0.2 | 0.2 | 0.2  |
|              | SCCA2 | <i>Scrophularia californica</i>                | 21  | 0.2 | 0.2 | 0.2  |
| Non-vascular |       |  |     |     |     |      |
|              | 2MOSS | Moss   | 86  | 2.0 | 0.2 | 4.0  |

***Alnus rubra* / *Rubus* spp. Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (12) and Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 73.9         | 42–98         | –          |
| <b>Herb</b>                          | 18.4         | 2–42          | <0.5–2     |
| <b>Shrub</b>                         | 26.1         | 6–77          | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 3.0          | 0–25          | 0.5–15     |
| <b>Hardwood</b>                      | 49.6         | 22–78         | 2–35       |
| <b>Conifer</b>                       | 2.2          | 0–15          | 2–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), NW (1), SW (7), variable (2)

**Macrotopography:** bottom (11), lower 1/3 of slope (3)

**Microtopography:** concave (11), convex (1), flat (1), undulating (1)

**Parent material:** Franciscan melange (3), mixed alluvium (2), sandstone (3), sedimentary (6)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1), sand (1)

**Slope steepness:** flat/0° (2), gentle/1–5° (9), moderate/6–25° (1)

|                          | Mean   | Range     |
|--------------------------|--------|-----------|
| <b>Elevation</b>         | 89 ft. | 6–201 ft. |
| <b>Slope</b>             | 2.7°   | 0–8°      |
| <b>Large rock cover</b>  | 2.0%   | 0–19%     |
| <b>Small rock cover</b>  | 15.4%  | 0–60%     |
| <b>Bare ground cover</b> | 11.4%  | 0–35%     |
| <b>Litter cover</b>      | 66.1%  | 5–95%     |

**Samples Used to Describe Association (n=14)**

**Rapid Assessments:** SONO0025, SONO0451, SONO0711, SONO0727, SONO0729, SONO0732, SONO0734, SONO0740, SONO0878, SONO0880, SONO0973, SONO0979

**Relevés:** SONO0003, SONO0021



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SCV Global/State Rank: G4/S3?<sup>1</sup>

**STAND TABLE**

***Alnus rubra* / *Rubus* spp. Provisional Association**

n = 14

| Lifeform                               | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | ALRU2  | * <i>Alnus rubra</i>                           | 100 | 45.1 | 12.0 | 75.0 |
|  | SESE3  | <i>Sequoia sempervirens</i>                    | 50  | 1.8  | 0.2  | 5.0  |
|  | UMCA   | * <i>Umbellularia californica</i>              | 29  | 6.6  | 0.2  | 15.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                 | 21  | 6.1  | 0.2  | 15.0 |
|  | FRLA   | * <i>Fraxinus latifolia</i>                    | 21  | 0.5  | 0.2  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | ALRU2  | * <i>Alnus rubra</i>                           | 64  | 4.1  | 0.2  | 25.0 |
|  | FRLA   | * <i>Fraxinus latifolia</i>                    | 29  | 0.8  | 0.2  | 2.2  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                 | 21  | 0.5  | 0.2  | 1.2  |
|  | UMCA   | * <i>Umbellularia californica</i>              | 21  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>                           | 79  | 13.1 | 0.2  | 40.0 |
|  | RUPA   | <i>Rubus parviflorus</i>                       | 64  | 3.6  | 0.2  | 10.0 |
|  | RUSP   | <i>Rubus spectabilis</i>                       | 36  | 17.6 | 1.0  | 30.0 |
|  | SASI2  | <i>Salix sitchensis</i>                        | 36  | 2.5  | 0.2  | 8.0  |
|  | RUAR9  | <i>Rubus armeniacus</i>                        | 29  | 11.5 | 1.0  | 29.0 |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i>      | 21  | 8.3  | 1.0  | 13.0 |
|  | SARAR3 | <i>Sambucus racemosa</i> var. <i>racemosa</i>  | 21  | 3.5  | 0.2  | 10.0 |
|  | PHCA11 | <i>Physocarpus capitatus</i>                   | 21  | 0.8  | 0.2  | 2.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                     | 21  | 0.5  | 0.2  | 1.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i> | 21  | 0.5  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>                     | 86  | 6.3  | 0.2  | 20.0 |
|  | URDI   | <i>Urtica dioica</i>                           | 50  | 8.3  | 0.2  | 41.0 |
|  | ATFI   | <i>Athyrium filix-femina</i>                   | 50  | 2.0  | 1.0  | 5.0  |
|  | EQUIS  | <i>Equisetum</i>                               | 50  | 0.9  | 0.2  | 4.0  |
|  | PEFRP  | <i>Petasites frigidus</i> var. <i>palmaris</i> | 29  | 0.9  | 0.2  | 3.0  |
|  | HOLA   | <i>Holcus lanatus</i>                          | 21  | 4.1  | 0.2  | 10.0 |
|  | ARDO3  | <i>Artemisia douglasiana</i>                   | 21  | 1.1  | 0.2  | 3.0  |
|  | CAREX  | <i>Carex</i>                                   | 21  | 0.5  | 0.2  | 1.0  |
|  | CYER   | <i>Cyperus eragrostis</i>                      | 21  | 0.2  | 0.2  | 0.2  |
|  | SCCA2  | <i>Scrophularia californica</i>                | 21  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 86  | 2.0  | 0.2  | 4.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Arbutus menziesii* Alliance**  
**Madrone forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Arbutus menziesii* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus kelloggii*, *Quercus wislizeni*, and *Umbellularia californica*.

*Arbutus menziesii* groves have traditionally been considered part of the “mixed evergreen forest” and not treated as a separate type (Sawyer 2007). Although *A. menziesii* is common as a secondary species in many forest types, it does form distinctive stands of high cover worthy of recognition in parts of the state that have relatively snow-free winters but upwards of 100 cm of annual precipitation. Stands in northern parts of the state mix with those of the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance.

Sonoma County

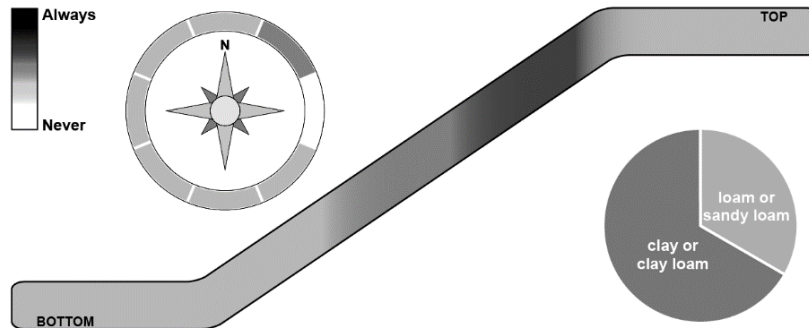
Stands in Sonoma County are ecologically intermediate between those of the *Umbellularia californica* and *Quercus agrifolia* Alliances. They tend to segregate from *Umbellularia californica* stands by occurring on upper slopes and convexities, and they tend to occur in somewhat more mesic settings than stands of *Quercus agrifolia*.

**Local Alliance Summary (n = 23)**

**Elevation:** 359–2962 ft, mean 1209 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 54.9         | 35–75         | –          |
| <b>Herb</b>             | 6.2          | 0–34          | <0.5–1     |
| <b>Shrub</b>            | 8.3          | 0.2–52        | <0.5–5     |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 13.4         | 0–45          | <0.5–20    |
| <b>Hardwood</b>                      | 34.3         | 0–61          | 2–35       |
| <b>Conifer</b>                       | 2.4          | 0–15          | 2–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 20.4° | 8–35°  |
| <b>Large rock cover</b>  | 0.6%  | 0–10%  |
| <b>Small rock cover</b>  | 3.3%  | 0–28%  |
| <b>Bare ground cover</b> | 13.4% | 0–74%  |
| <b>Litter cover</b>      | 80.5% | 20–99% |

**Associations within this Alliance:**

*Arbutus menziesii* – *Quercus agrifolia* Association

*Arbutus menziesii* – *Umbellularia californica* – *Quercus kelloggii* Association

*Arbutus menziesii* – *Umbellularia californica* Provisional Association

**STAND TABLE**

***Arbutus menziesii* Alliance**

n = 23

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|-------|---|-----|------|-----|------|
| <b>Tree</b>                            |       |   |     |      |     |      |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 96  | 27.5 | 5.0 | 60.0 |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 48  | 6.6  | 0.2 | 18.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>                          | 43  | 5.2  | 1.0 | 17.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 43  | 3.1  | 0.2 | 10.0 |
|  | QUKE  | <i>Quercus kelloggii</i>                            | 26  | 10.2 | 1.0 | 35.0 |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 74  | 3.7  | 0.2 | 20.2 |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 61  | 10.7 | 0.4 | 40.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 61  | 2.4  | 0.2 | 7.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>                          | 35  | 1.5  | 0.2 | 7.2  |
|  | NODE3 | <i>Notholithocarpus densiflorus</i>                 | 22  | 3.5  | 0.2 | 10.0 |
|  | QUW12 | <i>Quercus wislizeni</i>                            | 22  | 1.2  | 0.2 | 5.2  |
| <b>Shrub</b>                           |       |   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 74  | 1.0  | 0.2 | 3.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 61  | 2.1  | 0.2 | 7.0  |
|  | LOH12 | <i>Lonicera hispidula</i>                           | 39  | 0.8  | 0.2 | 3.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                     | 30  | 2.9  | 0.2 | 6.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 26  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |       |   |     |      |     |      |
|  | POCA5 | <i>Polygala californica</i>                         | 35  | 0.2  | 0.2 | 0.2  |
|  | PETR7 | <i>Pentagramma triangularis</i>                     | 30  | 0.3  | 0.2 | 1.0  |
| <b>Non-vascular</b>                    |       |   |     |      |     |      |
|  | 2MOSS | Moss  | 70  | 2.6  | 0.2 | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

## ***Arbutus menziesii* – *Quercus agrifolia* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2), Coastal Franciscan/263Ag (3), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 58.5                | 45–75                | –                 |
| <b>Herb</b>                          | 9.5                 | 0–32                 | <0.5–1            |
| <b>Shrub</b>                         | 10.1                | 1–52                 | 0.5–5             |
| <b>Regenerating/understory tree*</b> | 16.0                | 1–45                 | 1–20              |
| <b>Hardwood</b>                      | 35.4                | 5–52                 | 2–35              |
| <b>Conifer</b>                       | 0.6                 | 0–4                  | 5–15              |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** NE (2), NW (1), SE (2), SW (2), variable (1)

**Macrotopography:** lower to middle 1/3 of slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (2), middle 1/3 of slope to ridgetop (2), upper 1/3 of slope (2)

**Microtopography:** concave (1), convex (3), flat (1), undulating (3)

**Parent material:** Franciscan melange (3), rhyolite (1), sandstone (2), sedimentary (1), volcanic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6–25° (6), steep/>25° (2)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 811 ft.     | 359–1435 ft. |
| <b>Slope</b>             | 21.3°       | 12–35°       |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 2.7%        | 0–5%         |
| <b>Bare ground cover</b> | 21.9%       | 0–74%        |
| <b>Litter cover</b>      | 73.6%       | 20–98%       |

### **Samples Used to Describe Association (n=8)**

**Rapid Assessments:** SONO0069, SONO0139, SONO0155, SONO0606, SONO0618, SONO0636, SONO0841, SONO0994

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Arbutus menziesii* – *Quercus agrifolia* Association**

n = 8

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|-------|---|-----|------|-----|------|
| <b>Tree</b>                            |       |   |     |      |     |      |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 100 | 28.8 | 5.0 | 45.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>                          | 63  | 6.8  | 1.0 | 17.0 |
|  | QUGA4 | <i>Quercus garryana</i>                             | 25  | 4.5  | 4.0 | 5.0  |
|  | QUKE  | <i>Quercus kelloggii</i>                            | 25  | 4.5  | 4.0 | 5.0  |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 25  | 4.5  | 2.0 | 7.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 25  | 2.1  | 0.2 | 4.0  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |     |      |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 75  | 13.9 | 1.2 | 40.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>                          | 63  | 2.2  | 0.2 | 7.2  |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 63  | 1.4  | 0.2 | 2.2  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 50  | 3.1  | 0.4 | 6.0  |
| <b>Shrub</b>                           |       |   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 88  | 1.1  | 0.2 | 3.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 75  | 1.7  | 0.2 | 5.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                     | 63  | 1.9  | 0.2 | 6.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>                           | 38  | 1.1  | 0.2 | 3.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 38  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |       |   |     |      |     |      |
|  | CYEC  | <i>Cynosurus echinatus</i>                          | 25  | 9.5  | 4.0 | 15.0 |
|  | PETR7 | <i>Pentagramma triangularis</i>                     | 25  | 0.6  | 0.2 | 1.0  |
|  | IRIS  | <i>Iris</i>   | 25  | 0.2  | 0.2 | 0.2  |
|  | IRMA  | <i>Iris macrosiphon</i>                             | 25  | 0.2  | 0.2 | 0.2  |
|  | POCA5 | <i>Polygala californica</i>                         | 25  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |       |   |     |      |     |      |
|  | 2MOSS | Moss  | 63  | 3.1  | 0.2 | 8.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Arbutus menziesii* – *Umbellularia californica* – *Quercus kelloggii* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 59.0         | 53–64         | –          |
| <b>Herb</b>                          | 5.0          | 0–14          | 0.5–1      |
| <b>Shrub</b>                         | 19.3         | 2–34          | 1–5        |
| <b>Regenerating/understory tree*</b> | 16.0         | 2–33          | 1–10       |
| <b>Hardwood</b>                      | 25.7         | 0–56          | 5–15       |
| <b>Conifer</b>                       | 0.7          | 0–2           | 2–10       |

\*Includes seedlings and saplings

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**Summary of Environmental Data**

**Aspect:** NE (2), NW (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** convex (2), undulating (1)

**Parent material:** Franciscan melange (1), sandstone (1), sedimentary (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (2), steep/>25° (1)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 2484 ft. | 2162–2962 ft. |
| <b>Slope</b>             | 23.7°    | 17–34°        |
| <b>Large rock cover</b>  | 0.0%     | 0–0%          |
| <b>Small rock cover</b>  | 15.1%    | 2–28%         |
| <b>Bare ground cover</b> | 19.0%    | 18–20%        |
| <b>Litter cover</b>      | 63.0%    | 48–78%        |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0050, SONO0132, SONO0939

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Arbutus menziesii* – *Umbellularia californica* – *Quercus kelloggii* Association**

n = 3

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 67  | 24.5 | 14.0 | 35.0 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 67  | 16.0 | 7.0  | 25.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 67  | 0.6  | 0.2  | 1.0  |
|  | 2SNAG | Standing snag                     | 33  | 2.0  | 2.0  | 2.0  |
|  | ACMA3 | <i>Acer macrophyllum</i>          | 33  | 1.0  | 1.0  | 1.0  |
|  | PIAT  | * <i>Pinus attenuata</i>          | 33  | 1.0  | 1.0  | 1.0  |
|  | QUCH2 | <i>Quercus chrysolepis</i>        | 33  | 1.0  | 1.0  | 1.0  |
|  | PIPO  | <i>Pinus ponderosa</i>            | 33  | 0.2  | 0.2  | 0.2  |
|  | PISA2 | <i>Pinus sabiniana</i>            | 33  | 0.2  | 0.2  | 0.2  |
|  | UMCA  | * <i>Umbellularia californica</i> | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | ARME  | * <i>Arbutus menziesii</i>        | 67  | 11.5 | 5.0  | 18.0 |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 67  | 7.1  | 2.2  | 12.0 |
|  | PIAT  | * <i>Pinus attenuata</i>          | 67  | 3.6  | 3.2  | 4.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 33  | 1.0  | 1.0  | 1.0  |
|  | QUWI2 | <i>Quercus wislizeni</i>          | 33  | 0.2  | 0.2  | 0.2  |
|  | UMCA  | * <i>Umbellularia californica</i> | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Arbutus menziesii* – *Umbellularia californica* – *Quercus kelloggii* Association**

n = 3

| Lifeform | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|----------|-------|--|-----|------|------|------|
| Shrub    | CECU  | <i>Ceanothus cuneatus</i>                      | 67  | 2.5  | 1.0  | 4.0  |
|          | HEAR5 | <i>Heteromeles arbutifolia</i>                 | 67  | 1.6  | 0.2  | 3.0  |
|          | TODI  | <i>Toxicodendron diversilobum</i>              | 67  | 1.5  | 1.0  | 2.0  |
|          | CEPA3 | <i>Ceanothus parryi</i>                        | 33  | 20.0 | 20.0 | 20.0 |
|          | CEANO | <i>Ceanothus</i>                               | 33  | 8.0  | 8.0  | 8.0  |
|          | ADFA  | <i>Adenostoma fasciculatum</i>                 | 33  | 7.0  | 7.0  | 7.0  |
|          | ARMA  | <i>Arctostaphylos manzanita</i>                | 33  | 6.0  | 6.0  | 6.0  |
|          | CEMOG | <i>Cercocarpus montanus</i> var. <i>glaber</i> | 33  | 2.0  | 2.0  | 2.0  |
|          | ERIOD | <i>Eriodictyon</i>                             | 33  | 2.0  | 2.0  | 2.0  |
|          | QUDU4 | <i>Quercus durata</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|          | RIME  | <i>Ribes menziesii</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|          | ERCA6 | <i>Eriodictyon californicum</i>                | 33  | 0.2  | 0.2  | 0.2  |
|          | CEIN3 | <i>Ceanothus integerrimus</i>                  | 33  | 0.2  | 0.2  | 0.2  |

***Arbutus menziesii* – *Umbellularia californica* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (3), Coastal Franciscan/263Ag (5), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 49.7         | 35–70         | –          |
| <b>Herb</b>                          | 1.6          | 0–7           | <0.5–1     |
| <b>Shrub</b>                         | 4.2          | 0.2–18        | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 10.4         | 0–32          | <0.5–10    |
| <b>Hardwood</b>                      | 37.2         | 12–61         | 5–15       |
| <b>Conifer</b>                       | 3.1          | 0–12          | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), NW (4), SE (3), variable (1)

**Macrotopography:** bottom (1), bottom to upper 1/3 of slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (1), middle to upper 1/3 of slope (2), upper 1/3 of slope (4), upper 1/3 of slope to ridgetop (1)

**Summary of Environmental Data, continued**

**Microtopography:** concave (1), convex (6), flat (1), undulating (3)

**Parent material:** conglomerate (1), Franciscan melange (3), greenstone (1), metasedimentary (1), rhyolite (1), siltstone (1), volcanic (3)

**Soil texture:** clay or clay loam (4), loam or sandy loam (2)

**Slope steepness:** moderate/6–25° (9), steep/>25° (2)

|                         | Mean     | Range        |
|-------------------------|----------|--------------|
| <b>Elevation</b>        | 1199 ft. | 513–2590 ft. |
| <b>Slope</b>            | 18.5°    | 8–33°        |
| <b>Large rock cover</b> | 1.2%     | 0–10%        |

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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Small rock cover  | 1.5%  | 0–5%   |
| Bare ground cover | 6.1%  | 0–33%  |
| Litter cover      | 89.0% | 60–99% |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** MILOB007, SONO0053, SONO0135, SONO0202, SONO0631, SONO0683, SONO0848, SONO0855, SONO0859, SONO0989

**Relevés:** SONO0002

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Arbutus menziesii* – *Umbellularia californica* Provisional Association**

n = 11

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 100 | 29.4 | 12.0 | 60.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 73  | 7.9  | 1.0  | 18.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 45  | 4.0  | 0.2  | 10.0 |
|  | QUAG   | * <i>Quercus agrifolia</i>                       | 45  | 3.6  | 1.0  | 7.0  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 36  | 2.5  | 2.0  | 3.0  |
|  | QUWI2  | * <i>Quercus wislizeni</i>                       | 27  | 3.3  | 1.0  | 7.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                | 91  | 5.6  | 0.2  | 20.2 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 73  | 1.9  | 0.2  | 7.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 45  | 6.6  | 0.4  | 18.0 |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 45  | 3.5  | 0.2  | 10.0 |
|  | QUWI2  | * <i>Quercus wislizeni</i>                       | 36  | 1.5  | 0.2  | 5.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>                       | 27  | 0.3  | 0.2  | 0.4  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 73  | 0.9  | 0.2  | 3.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                   | 55  | 2.7  | 0.2  | 7.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 55  | 0.6  | 0.2  | 2.0  |
|  | ROGY   | <i>Rosa gymnocarpa</i>                           | 27  | 0.5  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | PETR7  | <i>Pentagramma triangularis</i>                  | 45  | 0.2  | 0.2  | 0.2  |
|  | POCA5  | <i>Polygala californica</i>                      | 45  | 0.2  | 0.2  | 0.2  |
|  | WHMO   | <i>Whipplea modesta</i>                          | 27  | 1.7  | 0.2  | 4.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 27  | 0.7  | 0.2  | 1.0  |
|  | ATFI   | <i>Athyrium filix-femina</i>                     | 27  | 0.2  | 0.2  | 0.2  |
|  | GALIU  | <i>Galium</i>                                    | 27  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 91  | 2.5  | 0.2  | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



***Fraxinus latifolia* Alliance**  
**Oregon ash groves**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Fraxinus latifolia* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Pinus ponderosa*, *Quercus kelloggii*, *Quercus wislizeni*, and *Salix laevigata*.

In California, the *Fraxinus latifolia* Alliance has been most thoroughly sampled in the western Sierra Nevada, where it occurs adjacent to stands of the riparian *Populus fremontii* and *Salix laevigata* Alliances or adjacent to stands of the upland *Pinus ponderosa* and *Quercus chrysolepis* Alliances (Potter 2005). Larger, extensive, bottomland stands occur in the North Coast Ranges from Mendocino County north; however, these have been poorly described.

Sonoma County

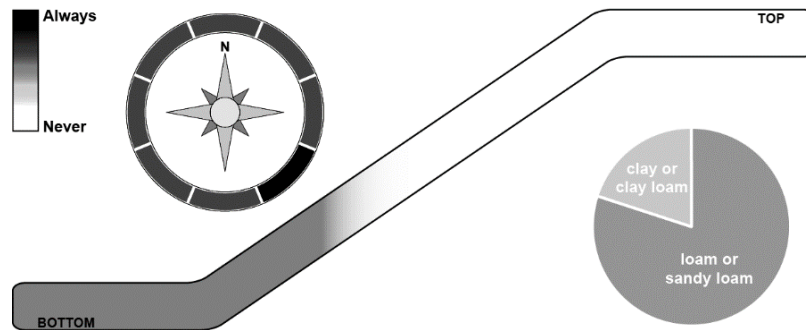
The Sonoma County *Fraxinus latifolia* stands are similar to those in the Sierra Nevada Foothills (Klein et al. 2007, Potter 2005).

**Local Alliance Summary (n = 6)**

**Elevation:** 24–760 ft, mean 227 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 75.2         | 36–97         | –          |
| <b>Herb</b>                          | 30.7         | 4–90          | <0.5–1     |
| <b>Shrub</b>                         | 20.5         | 1–50          | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 6.8          | 1–15          | 0.5–10     |
| <b>Hardwood</b>                      | 37.5         | 15–60         | 5–20       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 0.8°  | 0–3°   |
| Large rock cover  | 0.2%  | 0–1%   |
| Small rock cover  | 0.7%  | 0–4%   |
| Bare ground cover | 14.7% | 1–64%  |
| Litter cover      | 79.3% | 35–95% |

**Associations within this Alliance:**

*Fraxinus latifolia* – *Alnus rhombifolia* Association  
*Fraxinus latifolia* Association

**STAND TABLE**

***Fraxinus latifolia* Alliance**

n = 6

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|--------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                   |     |      |      |      |
|  | FRLA   | * <i>Fraxinus latifolia</i>       | 100 | 27.5 | 5.0  | 40.0 |
|  | UMCA   | * <i>Umbellularia californica</i> | 33  | 9.5  | 1.0  | 18.0 |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |      |      |
|  | FRLA   | * <i>Fraxinus latifolia</i>       | 100 | 5.7  | 0.2  | 15.0 |
|  | UMCA   | * <i>Umbellularia californica</i> | 33  | 0.7  | 0.2  | 1.2  |
| <b>Shrub</b>                           |        |                                   |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>              | 50  | 11.7 | 5.0  | 15.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i> | 50  | 3.7  | 1.0  | 5.0  |
|  | SALA6  | <i>Salix lasiolepis</i>           | 50  | 2.4  | 0.2  | 5.0  |
|  | RUAR9  | <i>Rubus armeniacus</i>           | 33  | 30.0 | 25.0 | 35.0 |
|  | ROCA2  | <i>Rosa californica</i>           | 33  | 1.1  | 0.2  | 2.0  |
|  | BAPI   | <i>Baccharis pilularis</i>        | 33  | 0.6  | 0.2  | 1.0  |
|  | ROSA5  | <i>Rosa</i>                       | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |                                   |     |      |      |      |
|  | CAREX  | <i>Carex</i>                      | 50  | 1.4  | 0.2  | 3.0  |
|  | HOLA   | <i>Holcus lanatus</i>             | 33  | 6.0  | 5.0  | 7.0  |
|  | JUPA2  | <i>Juncus patens</i>              | 33  | 2.0  | 2.0  | 2.0  |
|  | IRPS   | <i>Iris pseudacorus</i>           | 33  | 1.6  | 0.2  | 3.0  |
|  | POMU   | <i>Polystichum munitum</i>        | 33  | 1.0  | 1.0  | 1.0  |
|  | RUCO2  | <i>Rumex conglomeratus</i>        | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |                                   |     |      |      |      |
|  | 2LICHN | Lichen                            | 50  | 1.0  | 1.0  | 1.0  |
|  | 2MOSS  | Moss                              | 50  | 0.7  | 0.2  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Fraxinus latifolia* – *Alnus rhombifolia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsection (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 68.0         | 68            | –          |
| <b>Herb</b>                          | 4.0          | 4             | <0.5–0.5   |
| <b>Shrub</b>                         | 40.0         | 40            | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 15.0         | 15            | 2–5        |
| <b>Hardwood</b>                      | 35.0         | 35            | 15–20      |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1)  
**Macrotopography:** bottom (1)  
**Microtopography:** concave (1)  
**Parent material:** Franciscan melange (1)  
**Soil texture:** loam or sandy loam (1)  
**Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 760 ft. | 760 ft. |
| <b>Slope</b>             | 1.0°    | 1°      |
| <b>Large rock cover</b>  | 1.2%    | 1%      |
| <b>Small rock cover</b>  | 4.0%    | 4%      |
| <b>Bare ground cover</b> | 5.0%    | 5%      |
| <b>Litter cover</b>      | 87.0%   | 87%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO0681

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

**STAND TABLE**

***Fraxinus latifolia* – *Alnus rhombifolia* Association**

n = 1

| Lifeform                               | Code  | Botanical Name                  | Con | Avg  | Min  | Max  |
|--|-------|---------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                 |     |      |      |      |
|  | UMCA  | <i>Umbellularia californica</i> | 100 | 18.0 | 18.0 | 18.0 |
|  | ALRH2 | <i>Alnus rhombifolia</i>        | 100 | 17.0 | 17.0 | 17.0 |
|  | FRLA  | * <i>Fraxinus latifolia</i>     | 100 | 5.0  | 5.0  | 5.0  |
|  | QUAG  | <i>Quercus agrifolia</i>        | 100 | 1.0  | 1.0  | 1.0  |
|  | JUGLA | <i>Juglans</i>                  | 100 | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |       |                                 |     |      |      |      |
|  | FRLA  | * <i>Fraxinus latifolia</i>     | 100 | 15.0 | 15.0 | 15.0 |
|  | ACMA3 | <i>Acer macrophyllum</i>        | 100 | 2.2  | 2.2  | 2.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Fraxinus latifolia* – *Alnus rhombifolia* Association**

n = 1

| Lifeform     | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--------------|--------|-----------------------------------|-----|------|------|------|
| Shrub        | RUAR9  | <i>Rubus armeniacus</i>           | 100 | 35.0 | 35.0 | 35.0 |
|              | TODI   | <i>Toxicodendron diversilobum</i> | 100 | 5.0  | 5.0  | 5.0  |
|              | SYMO   | <i>Symphoricarpos mollis</i>      | 100 | 2.0  | 2.0  | 2.0  |
|              | BAPI   | <i>Baccharis pilularis</i>        | 100 | 1.0  | 1.0  | 1.0  |
|              | ARCA10 | <i>Aristolochia californica</i>   | 100 | 0.2  | 0.2  | 0.2  |
|              | RULE   | <i>Rubus leucodermis</i>          | 100 | 0.2  | 0.2  | 0.2  |
| Herb         | ARDO3  | <i>Artemisia douglasiana</i>      | 100 | 1.0  | 1.0  | 1.0  |
|              | MEOF2  | <i>Melissa officinalis</i>        | 100 | 0.2  | 0.2  | 0.2  |
|              | PETR7  | <i>Pentagramma triangularis</i>   | 100 | 0.2  | 0.2  | 0.2  |
|              | DAGL2  | <i>Datisca glomerata</i>          | 100 | 0.2  | 0.2  | 0.2  |
|              | CAREX  | <i>Carex</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|              | LILIU  | <i>Lilium</i>                     | 100 | 0.2  | 0.2  | 0.2  |
| Non-vascular | 2MOSS  | Moss                              | 100 | 1.0  | 1.0  | 1.0  |

***Fraxinus latifolia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 76.6         | 36–97         | –          |
| Herb                          | 36.0         | 15–90         | <0.5–1     |
| Shrub                         | 16.6         | 1–50          | 0.5–2      |
| Regenerating/understory tree* | 5.2          | 1–10          | 0.5–10     |
| Hardwood                      | 38.0         | 15–60         | 5–15       |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), variable (3)

**Macrotopography:** bottom (2), lower 1/3 of slope (3)

**Microtopography:** concave (3), flat (2)

**Parent material:** mixed alluvium (2), sandstone (1), sandy alluvium (1), sedimentary (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (3)

**Slope steepness:** flat/0° (3), gentle/1-5° (2)

|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 120 ft. | 24–250 ft. |
| Slope             | 0.8°    | 0–3°       |
| Large rock cover  | 0.0%    | 0–0%       |
| Small rock cover  | 0.1%    | 0–0.2%     |
| Bare ground cover | 16.6%   | 1–64%      |
| Litter cover      | 77.8%   | 35–95%     |

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**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0097, SONO0198, SONO0222, SONO0502, SONO0802

**Relevés:** none

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

**STAND TABLE**

***Fraxinus latifolia* Association**

n = 5

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            |             |  |            |            |            |            |
|  | FRLA        | * <i>Fraxinus latifolia</i>                        | 100        | 32.0       | 15.0       | 40.0       |
|  | SALUL       | * <i>Salix lucida</i> ssp. <i>lasiandra</i>        | 20         | 25.0       | 25.0       | 25.0       |
|  | 2SNAG       | Standing snag                                      | 20         | 12.0       | 12.0       | 12.0       |
|  | SALA3       | * <i>Salix laevigata</i>                           | 20         | 5.0        | 5.0        | 5.0        |
|  | UMCA        | * <i>Umbellularia californica</i>                  | 20         | 1.0        | 1.0        | 1.0        |
|  | QULO        | <i>Quercus lobata</i>                              | 20         | 0.2        | 0.2        | 0.2        |
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | FRLA        | * <i>Fraxinus latifolia</i>                        | 100        | 3.9        | 0.2        | 8.0        |
|  | UMCA        | * <i>Umbellularia californica</i>                  | 40         | 0.7        | 0.2        | 1.2        |
|  | SALUL       | * <i>Salix lucida</i> ssp. <i>lasiandra</i>        | 20         | 5.0        | 5.0        | 5.0        |
|  | SALA3       | * <i>Salix laevigata</i>                           | 20         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | RUUR        | <i>Rubus ursinus</i>                               | 60         | 11.7       | 5.0        | 15.0       |
|  | SALA6       | <i>Salix lasiolepis</i>                            | 60         | 2.4        | 0.2        | 5.0        |
|  | TODI        | <i>Toxicodendron diversilobum</i>                  | 40         | 3.0        | 1.0        | 5.0        |
|  | ROCA2       | <i>Rosa californica</i>                            | 40         | 1.1        | 0.2        | 2.0        |
|  | ROSA5       | <i>Rosa</i>  | 40         | 0.2        | 0.2        | 0.2        |
|  | RUAR9       | <i>Rubus armeniacus</i>                            | 20         | 25.0       | 25.0       | 25.0       |
|  | SYAL        | <i>Symphoricarpos albus</i>                        | 20         | 5.0        | 5.0        | 5.0        |
|  | RUPA        | <i>Rubus parviflorus</i>                           | 20         | 3.0        | 3.0        | 3.0        |
|  | CRDO2       | <i>Crataegus douglasii</i>                         | 20         | 1.0        | 1.0        | 1.0        |
|  | RUSP        | <i>Rubus spectabilis</i>                           | 20         | 1.0        | 1.0        | 1.0        |
|  | PHCA11      | <i>Physocarpus capitatus</i>                       | 20         | 0.2        | 0.2        | 0.2        |
|  | PARTH3      | <i>Parthenocissus</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|  | SANIC5      | <i>Sambucus nigra</i> ssp. <i>cerulea</i>          | 20         | 0.2        | 0.2        | 0.2        |
|  | RUBUS       | <i>Rubus</i>                                       | 20         | 0.2        | 0.2        | 0.2        |
|  | LOINL       | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 20         | 0.2        | 0.2        | 0.2        |
|  | BAPI        | <i>Baccharis pilularis</i>                         | 20         | 0.2        | 0.2        | 0.2        |
|  | COLA18      | <i>Cotoneaster lacteus</i>                         | 20         | 0.2        | 0.2        | 0.2        |
|  | CAOC5       | <i>Calycanthus occidentalis</i>                    | 20         | 0.2        | 0.2        | 0.2        |
|  | RIBES       | <i>Ribes</i>                                       | 20         | 0.2        | 0.2        | 0.2        |
|  | PHORA       | <i>Phoradendron</i>                                | 20         |            |            |            |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | HOLA        | <i>Holcus lanatus</i>                              | 40         | 6.0        | 5.0        | 7.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Fraxinus latifolia* Association**

n = 5

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                       | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>         |             |   |            |            |            |            |
|                     | CAREX       | <i>Carex</i>                                | 40         | 2.0        | 1.0        | 3.0        |
|                     | JUPA2       | <i>Juncus patens</i>                        | 40         | 2.0        | 2.0        | 2.0        |
|                     | IRPS        | <i>Iris pseudacorus</i>                     | 40         | 1.6        | 0.2        | 3.0        |
|                     | POMU        | <i>Polystichum munitum</i>                  | 40         | 1.0        | 1.0        | 1.0        |
|                     | RUCO2       | <i>Rumex conglomeratus</i>                  | 40         | 0.2        | 0.2        | 0.2        |
|                     | AGST2       | <i>Agrostis stolonifera</i>                 | 20         | 80.0       | 80.0       | 80.0       |
|                     | BIFR        | <i>Bidens frondosa</i>                      | 20         | 23.0       | 23.0       | 23.0       |
|                     | OESA        | <i>Oenanthе sarmentosa</i>                  | 20         | 20.0       | 20.0       | 20.0       |
|                     | EUOC4       | <i>Euthamia occidentalis</i>                | 20         | 5.0        | 5.0        | 5.0        |
|                     | AGROS2      | <i>Agrostis</i>                             | 20         | 5.0        | 5.0        | 5.0        |
|                     | CYEC        | <i>Cynosurus echinatus</i>                  | 20         | 5.0        | 5.0        | 5.0        |
|                     | LOPE        | <i>Lolium perenne</i>                       | 20         | 4.0        | 4.0        | 4.0        |
|                     | ELGL        | <i>Elymus glaucus</i>                       | 20         | 3.0        | 3.0        | 3.0        |
|                     | RUCR        | <i>Rumex crispus</i>                        | 20         | 3.0        | 3.0        | 3.0        |
|                     | EPCI        | <i>Epilobium ciliatum</i>                   | 20         | 2.0        | 2.0        | 2.0        |
|                     | CABA4       | <i>Carex barbarae</i>                       | 20         | 1.0        | 1.0        | 1.0        |
|                     | HEHE        | <i>Hedera helix</i>                         | 20         | 1.0        | 1.0        | 1.0        |
|                     | JUEFP       | <i>Juncus effusus</i> var. <i>pacificus</i> | 20         | 1.0        | 1.0        | 1.0        |
|                     | BAOR        | <i>Barbarea orthoceras</i>                  | 20         | 0.2        | 0.2        | 0.2        |
|                     | DRAR3       | <i>Dryopteris arguta</i>                    | 20         | 0.2        | 0.2        | 0.2        |
|                     | JUNCU       | <i>Juncus</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                     | MEPU        | <i>Mentha pulegium</i>                      | 20         | 0.2        | 0.2        | 0.2        |
|                     | EPBR3       | <i>Epilobium brachycarpum</i>               | 20         | 0.2        | 0.2        | 0.2        |
|                     | CUPE3       | <i>Cuscuta pentagona</i>                    | 20         | 0.2        | 0.2        | 0.2        |
|                     | COAR4       | <i>Convolvulus arvensis</i>                 | 20         | 0.2        | 0.2        | 0.2        |
|                     | CIVU        | <i>Cirsium vulgare</i>                      | 20         | 0.2        | 0.2        | 0.2        |
|                     | COMA2       | <i>Conium maculatum</i>                     | 20         | 0.2        | 0.2        | 0.2        |
|                     | CYER        | <i>Cyperus eragrostis</i>                   | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |   |            |            |            |            |
|                     | 2LICHN      | Lichen                                      | 60         | 1.0        | 1.0        | 1.0        |
|                     | 2MOSS       | Moss  | 40         | 0.6        | 0.2        | 1.0        |

***Hesperocyparis macnabiana* Alliance**  
**McNab cypress woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Hesperocyparis macnabiana* is dominant in the tree canopy with *Hesperocyparis sargentii*, *Pinus attenuata*, and *Pinus sabiniana*. Shrubs may include *Arctostaphylos viscida*.

This is the most abundant and widespread cypress in the state (Griffin and Critchfield 1972). Several large stands are scattered throughout northern California, mostly on serpentine or volcanic rocks (Alexander et al. 2007, Barbour 2007). The genus *Cupressus* is now restricted to the Old World; cypresses in California belong to the genus *Hesperocyparis* (Bartel et al. 2003, Little 2006, Adams et al. 2009, Terry et al. 2012).

Sonoma County

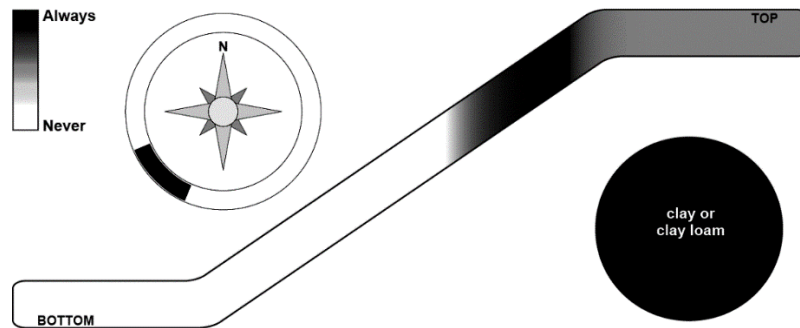
The *Hesperocyparis macnabiana* Alliance is poorly represented in Sonoma County. The only known stands are on serpentine in the inland northeastern portion of the county. Some of these occur near *Hesperocyparis sargentii* stands, so careful identification of the genus in this area is important.

**Local Alliance Summary (n = 2)**

**Elevation:** 1994–3088 ft, mean 2541 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 34.5         | 26–43         | –          |
| <b>Herb</b>                          | 0.6          | 0–1           | <0.5–0.5   |
| <b>Shrub</b>                         | 11.5         | 7–16          | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 4.5          | 0–9           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 17.6         | 0–35          | 2–10       |

\*Includes seedlings and saplings

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 10.0° | 10°    |
| Large rock cover  | 1.8%  | 1–2%   |
| Small rock cover  | 1.2%  | 0–2%   |
| Bare ground cover | 17.0% | 4–30%  |
| Litter cover      | 76.5% | 65–88% |

**Associations within this Alliance:**

*Hesperocyparis macnabiana* / *Arctostaphylos viscida* Association

**STAND TABLE**

***Hesperocyparis macnabiana* Alliance**

n = 2

| Lifeform                               | Code   | Botanical Name                     | Con | Avg  | Min  | Max  |
|--|--------|------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                    |     |      |      |      |
|  | HEMA21 | * <i>Hesperocyparis macnabiana</i> | 100 | 17.6 | 0.2  | 35.0 |
|  | PISA2  | * <i>Pinus sabiniana</i>           | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |                                    |     |      |      |      |
|  | HEMA21 | * <i>Hesperocyparis macnabiana</i> | 50  | 8.2  | 8.2  | 8.2  |
|  | PISA2  | * <i>Pinus sabiniana</i>           | 50  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |                                    |     |      |      |      |
|  | QUDU4  | <i>Quercus durata</i>              | 100 | 0.2  | 0.2  | 0.2  |
|  | ARVI4  | <i>Arctostaphylos viscida</i>      | 50  | 14.0 | 14.0 | 14.0 |
|  | ARMA   | <i>Arctostaphylos manzanita</i>    | 50  | 5.0  | 5.0  | 5.0  |
|  | ADFA   | <i>Adenostoma fasciculatum</i>     | 50  | 1.0  | 1.0  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>     | 50  | 1.0  | 1.0  | 1.0  |
|  | CEJE   | <i>Ceanothus jepsonii</i>          | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |                                    |     |      |      |      |
|  | GAPO   | <i>Galium porrigens</i>            | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |                                    |     |      |      |      |
|  | 2MOSS  | Moss                               | 50  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Hesperocyparis macnabiana* / *Arctostaphylos viscida* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 26.0         | 26            | –          |
| Herb                          | 0.2          | 0.2           | <0.5–0.5   |
| Shrub                         | 16.0         | 16            | 0.5–1      |
| Regenerating/understory tree* | 9.0          | 9             | 2–5        |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.2          | 0.2           | 5–10       |

\*Includes seedlings and saplings



**Summary of Environmental Data**

**Aspect:** SE (1)  
**Macrotopography:** upper 1/3 of slope (1)  
**Microtopography:** concave (1)  
**Parent material:** serpentine (1)  
**Soil texture:** clay or clay loam (1)  
**Slope steepness:** moderate/6-25° (1)

|                          | Mean     | Range    |
|--------------------------|----------|----------|
| <b>Elevation</b>         | 3088 ft. | 3088 ft. |
| <b>Large rock cover</b>  | 2.4%     | 2.4%     |
| <b>Small rock cover</b>  | 2.0%     | 2%       |
| <b>Bare ground cover</b> | 4.0%     | 4%       |
| <b>Litter cover</b>      | 88.0%    | 88%      |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0044  
**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Hesperocyparis macnabiana* / *Arctostaphylos viscida* Association**

n = 1

| Lifeform                               | Code   | Botanical Name                     | Con | Avg  | Min  | Max  |
|--|--------|------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                    |     |      |      |      |
|  | HEMA21 | * <i>Hesperocyparis macnabiana</i> | 100 | 0.2  | 0.2  | 0.2  |
|  | PISA2  | * <i>Pinus sabiniana</i>           | 100 | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |                                    |     |      |      |      |
|  | HEMA21 | * <i>Hesperocyparis macnabiana</i> | 100 | 8.2  | 8.2  | 8.2  |
|  | PISA2  | * <i>Pinus sabiniana</i>           | 100 | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |                                    |     |      |      |      |
|  | ARVI4  | <i>Arctostaphylos viscida</i>      | 100 | 14.0 | 14.0 | 14.0 |
|  | CEJE   | <i>Ceanothus jepsonii</i>          | 100 | 0.2  | 0.2  | 0.2  |
|  | QUDU4  | <i>Quercus durata</i>              | 100 | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Hesperocyparis macrocarpa* Special Stands and Semi-Natural Alliance**  
**Monterey cypress stands**

Statewide (Sawyer et al. 2009)

*Hesperocyparis macrocarpa* is dominant or co-dominant in the tree canopy with *Pinus radiata*.

Despite the rarity of natural groves, *Hesperocyparis macrocarpa* has invasive tendencies in many places along the California coast. It has been planted along roads, as hedgerows, and as specimen ornamentals throughout the area.

Sonoma County

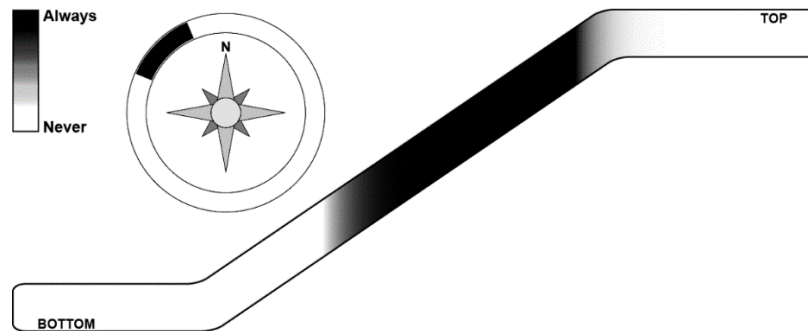
The single *Hesperocyparis macrocarpa* sample from Sonoma County is a planted stand.

**Local Alliance Summary (n = 1)**

**Elevation:** 436 ft

**SCV Global/State Rank:** G1/S1<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 60            | –          |
| <b>Herb</b>                          | 3.0          | 3             | 0.5–1      |
| <b>Shrub</b>                         | 0.2          | 0.2           | 1–2        |
| <b>Regenerating/understory tree*</b> | 2.0          | 2             | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 60.0         | 60            | 10–15      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                         | Mean  | Range |
|-------------------------|-------|-------|
| <b>Slope</b>            | 25.0° | 25°   |
| <b>Large rock cover</b> | 0.0%  | 0%    |
| <b>Small rock cover</b> | 0.4%  | 0.4%  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                   | Mean  | Range |
|-------------------|-------|-------|
| Bare ground cover | 24.0% | 24%   |
| Litter cover      | 75.0% | 75%   |

**Associations within this Alliance:**

*Hesperocyparis macrocarpa* Provisional Semi-Natural Association

**STAND TABLE**

***Hesperocyparis macrocarpa* Special Stands and Semi-Natural Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name                     | Con | Avg  | Min  | Max  |
|--|--------|------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                    |     |      |      |      |
|  | HEMA22 | * <i>Hesperocyparis macrocarpa</i> | 100 | 60.0 | 60.0 | 60.0 |
| <b>Regenerating or Understory Tree</b> |        |                                    |     |      |      |      |
|  | HEMA22 | * <i>Hesperocyparis macrocarpa</i> | 100 | 2.2  | 2.2  | 2.2  |
| <b>Shrub</b>                           |        |                                    |     |      |      |      |
|  | BAPI   | <i>Baccharis pilularis</i>         | 100 | 0.2  | 0.2  | 0.2  |
|  | RUUR   | <i>Rubus ursinus</i>               | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |                                    |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>         | 100 | 2.0  | 2.0  | 2.0  |
|  | COMA2  | <i>Conium maculatum</i>            | 100 | 1.0  | 1.0  | 1.0  |
|  | JUPA2  | <i>Juncus patens</i>               | 100 | 1.0  | 1.0  | 1.0  |
|  | PLLA   | <i>Plantago lanceolata</i>         | 100 | 1.0  | 1.0  | 1.0  |
|  | CIVU   | <i>Cirsium vulgare</i>             | 100 | 0.2  | 0.2  | 0.2  |
|  | HOLA   | <i>Holcus lanatus</i>              | 100 | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |                                    |     |      |      |      |
|  | 2MOSS  | Moss                               | 100 | 5.0  | 5.0  | 5.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Hesperocyparis macrocarpa* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 60            | –          |
| <b>Herb</b>                          | 3.0          | 3             | 0.5–1      |
| <b>Shrub</b>                         | 0.2          | 0.2           | 1–2        |
| <b>Regenerating/understory tree*</b> | 2.0          | 2             | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 60.0         | 60            | 10–15      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1)

**Macrotopography:** middle to upper 1/3 of slope (1)

**Microtopography:** convex (1)

*Hesperocyparis macrocarpa* Special Stands and Semi-Natural Alliance

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**Summary of Environmental Data, continued**

**Parent material:** sandstone (1)

**Soil texture:** no data (1)

**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 436 ft. | 436 ft. |
| <b>Slope</b>             | 25.0°   | 25°     |
| <b>Large rock cover</b>  | 0.0%    | 0%      |
| <b>Small rock cover</b>  | 0.4%    | 0.4%    |
| <b>Bare ground cover</b> | 24.0%   | 24%     |
| <b>Litter cover</b>      | 75.0%   | 75%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0601

**Relevés:** none

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Hesperocyparis macrocarpa* Provisional Semi-Natural Association**

n = 1

| Lifeform                               | Code   | Botanical Name                     | Con | Avg  | Min  | Max  |
|--|--------|------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                    |     |      |      |      |
|  | HEMA22 | * <i>Hesperocyparis macrocarpa</i> | 100 | 60.0 | 60.0 | 60.0 |
| <b>Regenerating or Understory Tree</b> |        |                                    |     |      |      |      |
|  | HEMA22 | * <i>Hesperocyparis macrocarpa</i> | 100 | 2.2  | 2.2  | 2.2  |
| <b>Shrub</b>                           |        |                                    |     |      |      |      |
|  | BAPI   | <i>Baccharis pilularis</i>         | 100 | 0.2  | 0.2  | 0.2  |
|  | RUUR   | <i>Rubus ursinus</i>               | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |                                    |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>         | 100 | 2.0  | 2.0  | 2.0  |
|  | COMA2  | <i>Conium maculatum</i>            | 100 | 1.0  | 1.0  | 1.0  |
|  | JUPA2  | <i>Juncus patens</i>               | 100 | 1.0  | 1.0  | 1.0  |
|  | PLLA   | <i>Plantago lanceolata</i>         | 100 | 1.0  | 1.0  | 1.0  |
|  | CIVU   | <i>Cirsium vulgare</i>             | 100 | 0.2  | 0.2  | 0.2  |
|  | HOLA   | <i>Holcus lanatus</i>              | 100 | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |                                    |     |      |      |      |
|  | 2MOSS  | Moss                               | 100 | 5.0  | 5.0  | 5.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

## ***Hesperocyparis sargentii* Alliance**

### **Sargent cypress woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Hesperocyparis sargentii* is dominant in the tree canopy with *Hesperocyparis macnabiana*, *Pinus attenuata*, *Pinus sabiniana*, *Pseudotsuga menziesii*, *Quercus wislizeni*, and *Umbellularia californica*.

*Hesperocyparis sargentii* is an abundant and widespread cypress with two centers of distribution. The northern stands, centered in the San Francisco Bay area and southern North Coast Ranges, may contain *H. macnabiana* and species of *Arctostaphylos*. *Hesperocyparis macnabiana* tends to grow on upper slopes, and *H. sargentii* often grows on lower slopes and in ravines. The upland stands of *H. sargentii* in the North Coast Ranges are associated with shallow water tables or impeded drainage (Alexander et al. 2007). The southern stands, centered in the Santa Lucia Mountains, are more purely *Hesperocyparis sargentii*. There are genetic differences between the two centers (Bartel et al. 2003).

#### Sonoma County

The largest *Hesperocyparis sargentii* stands in Sonoma County are found in The Cedars region and occur on uplands and lower slopes and ravines.

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#### **Local Alliance Summary (n = 21)**

**Elevation:** 332–2210 ft, mean 1285 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

#### **Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe global/state rank: G2T1/S1

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2T2/S2

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe global/state rank: G1/S1

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

*Erigeron serpentinus*

CA rare plant rank: 1B.3

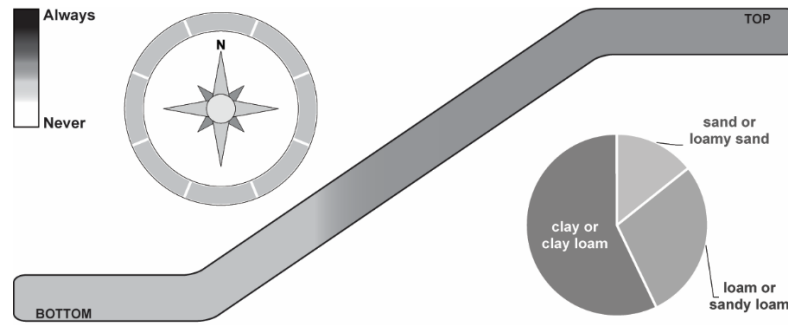
NatureServe global/state rank: G2/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 49.8         | 30–70         | –          |
| <b>Herb</b>                          | 5.3          | 0–25          | <0.5–1     |
| <b>Shrub</b>                         | 21.9         | 0.2–60        | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 1.9          | 0–11          | <0.5–10    |
| <b>Hardwood</b>                      | 1.0          | 0–8           | 2–15       |
| <b>Conifer</b>                       | 27.7         | 10–50         | 1–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 17.1° | 0–28° |
| <b>Large rock cover</b>  | 6.7%  | 0–37% |
| <b>Small rock cover</b>  | 20.5% | 0–52% |
| <b>Bare ground cover</b> | 11.8% | 1–37% |
| <b>Litter cover</b>      | 58.9% | 1–93% |

**Associations within this Alliance:**

- Hesperocyparis sargentii* / *Ceanothus jepsonii* – *Arctostaphylos* spp. Provisional Association
- Hesperocyparis sargentii* / *Quercus durata* (Mesic) Provisional Association
- Hesperocyparis sargentii* Riparian Association

**STAND TABLE**

***Hesperocyparis sargentii* Alliance**

n = 21

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|--------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                   |     |      |      |      |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 100 | 30.0 | 10.0 | 80.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 48  | 5.8  | 0.2  | 22.0 |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 57  | 1.1  | 0.2  | 3.2  |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 38  | 2.7  | 0.2  | 10.0 |
|  | UMCA   | <i>Umbellularia californica</i>   | 33  | 0.5  | 0.2  | 1.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Hesperocyparis sargentii* Alliance**

n = 21

| Lifeform            | Code   | Botanical Name                    | Con | Avg  | Min | Max  |
|---------------------|--------|-----------------------------------|-----|------|-----|------|
| <b>Shrub</b>        |        |                                   |     |      |     |      |
|                     | QUDU4  | <i>Quercus durata</i>             | 48  | 8.0  | 0.2 | 26.0 |
|                     | CEJE   | <i>Ceanothus jepsonii</i>         | 43  | 1.0  | 0.2 | 2.0  |
|                     | HEAR5  | <i>Heteromeles arbutifolia</i>    | 38  | 3.1  | 0.2 | 9.0  |
|                     | ARBA4  | <i>Arctostaphylos bakeri</i>      | 29  | 11.9 | 0.2 | 35.0 |
|                     | TODI   | <i>Toxicodendron diversilobum</i> | 24  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>         |        |                                   |     |      |     |      |
|                     | METO   | <i>Melica torreyana</i>           | 52  | 0.7  | 0.2 | 3.0  |
|                     | IRMA   | <i>Iris macrosiphon</i>           | 33  | 1.8  | 0.2 | 6.0  |
|                     | CAREX  | <i>Carex</i>                      | 33  | 0.9  | 0.2 | 2.0  |
|                     | POCA5  | <i>Polygala californica</i>       | 29  | 0.2  | 0.2 | 0.2  |
|                     | PHDE14 | <i>Phoradendron densum</i>        | 24  | 2.2  | 0.2 | 10.0 |
|                     | GAPO   | <i>Galium porrigens</i>           | 24  | 0.5  | 0.2 | 1.0  |
| <b>Non-vascular</b> |        |                                   |     |      |     |      |
|                     | 2MOSS  | Moss                              | 81  | 4.7  | 0.2 | 18.0 |
|                     | 2LICHN | Lichen                            | 24  | 0.9  | 0.2 | 2.0  |

**Noteworthy Taxa**

- Arctostaphylos bakeri* ssp. *bakeri*  
CA rare plant rank: 1B.1  
NatureServe global/state rank: G2T1/S1
- Arctostaphylos bakeri* ssp. *sublaevis*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G2T2/S2
- Ceanothus confusus*  
CA rare plant rank: 1B.1  
NatureServe global/state rank: G1/S1
- Ceanothus sonomensis*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G2/S2
- Erigeron serpentinus*  
CA rare plant rank: 1B.3  
NatureServe global/state rank: G2/S2

***Hesperocyparis sargentii* / *Ceanothus jepsonii* – *Arctostaphylos* spp.  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (9) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 49.6         | 35–70         | –          |
| <b>Herb</b>             | 1.3          | 0–5           | <0.5–1     |
| <b>Shrub</b>            | 19.6         | 7–45          | 0.5–5      |

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 2.2          | 0–11          | <0.5–5     |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 2–10       |
| <b>Conifer</b>                       | 30.0         | 18–40         | 1–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (3), SE (2), SW (3), variable (1)

**Macrotopography:** middle 1/3 of slope to ridgetop (2), ridge top (1), upper 1/3 of slope (3), upper 1/3 of slope to ridgetop (3)

**Microtopography:** convex (4), flat (3), undulating (2)

**Parent material:** peridotite (2), serpentine (6), ultramafic (1)

**Soil texture:** clay or clay loam (3), loam or sandy loam (2)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (5), steep/>25° (1)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1116 ft. | 332–1925 ft. |
| <b>Slope</b>             | 14.3°    | 2–28°        |
| <b>Large rock cover</b>  | 4.6%     | 2–12%        |
| <b>Small rock cover</b>  | 29.1%    | 8–47%        |
| <b>Bare ground cover</b> | 11.7%    | 2–29%        |
| <b>Litter cover</b>      | 52.8%    | 25–73%       |

**Samples Used to Describe Association (n=9)**

**Rapid Assessments:** SERP0003, SERP0004, SONO0142, SONO0245, SONO0264, SONO0274, SONO0303, SONO0305, SONO0614

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

*Hesperocyparis sargentii* / *Ceanothus jepsonii* – *Arctostaphylos* spp. Provisional

n = 9

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            | HESA17 | * <i>Hesperocyparis sargentii</i>                     | 100 | 38.1 | 18.0 | 80.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                        | 33  | 1.1  | 0.2  | 2.0  |
| <b>Regenerating or Understory Tree</b> | PSME   | * <i>Pseudotsuga menziesii</i>                        | 44  | 1.4  | 0.4  | 3.0  |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                     | 33  | 4.1  | 1.0  | 10.2 |
|  | ARME   | <i>Arbutus menziesii</i>                              | 22  | 0.3  | 0.2  | 0.4  |
| <b>Shrub</b>                           | CEJE   | <i>Ceanothus jepsonii</i>                             | 100 | 1.0  | 0.2  | 2.0  |
|  | ARBA4  | * <i>Arctostaphylos bakeri</i>                        | 33  | 22.0 | 12.0 | 35.0 |
|  | QUDU4  | <i>Quercus durata</i>                                 | 33  | 0.5  | 0.2  | 1.0  |
|  | ARVIP2 | * <i>Arctostaphylos viscida</i> ssp. <i>pulchella</i> | 22  | 9.5  | 7.0  | 12.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

***Hesperocyparis sargentii* / *Ceanothus jepsonii* – *Arctostaphylos* spp. Provisional**

n = 9

| Lifeform     | Code   | Botanical Name  | Con                        | Avg | Min | Max  |
|--------------|--------|---|----------------------------|-----|-----|------|
| Shrub        | ARVI4  | * <i>Arctostaphylos viscida</i>                         | 22                         | 9.0 | 6.0 | 12.0 |
|              | ARMAG  | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 22                         | 5.0 | 4.0 | 6.0  |
|              | ARBAS  | * <i>Arctostaphylos bakeri</i> ssp. <i>sublaevis</i>    | 22                         | 4.5 | 1.0 | 8.0  |
|              | ARBAB  | * <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i>       | 22                         | 4.0 | 1.0 | 7.0  |
|              | HEAR5  | <i>Heteromeles arbutifolia</i>                          | 22                         | 2.6 | 0.2 | 5.0  |
|              | ADFA   | <i>Adenostoma fasciculatum</i>                          | 22                         | 0.6 | 0.2 | 1.0  |
|              | TODI   | <i>Toxicodendron diversilobum</i>                       | 22                         | 0.2 | 0.2 | 0.2  |
|              | Herb   | PHDE14  | <i>Phoradendron densum</i> | 44  | 2.7 | 0.2  |
| CAREX        |        | <i>Carex</i>  | 44                         | 0.9 | 0.2 | 2.0  |
| METO         |        | <i>Melica torreyana</i>                                 | 33                         | 1.1 | 0.2 | 3.0  |
| GAPO         |        | <i>Galium porrigens</i>                                 | 22                         | 1.0 | 1.0 | 1.0  |
| CAGL7        |        | <i>Carex globosa</i>                                    | 22                         | 0.2 | 0.2 | 0.2  |
| IRMA         |        | <i>Iris macrosiphon</i>                                 | 22                         | 0.2 | 0.2 | 0.2  |
| POCA5        |        | <i>Polygala californica</i>                             | 22                         | 0.2 | 0.2 | 0.2  |
| Non-vascular |        | 2MOSS   | Moss                       | 78  | 5.7 | 1.0  |
|              | 2LICHN | Lichen  | 44                         | 0.9 | 0.2 | 2.0  |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G2T1/S1

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Hesperocyparis sargentii* / *Quercus durata* (Mesic) Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (9) and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 52.8         | 30–70         | –          |
| Herb                          | 8.4          | 0–25          | <0.5–1     |
| Shrub                         | 27.3         | 0.2–60        | 0.5–5      |
| Regenerating/understory tree* | 1.4          | 0–7           | <0.5–10    |
| Hardwood                      | 1.8          | 0–8           | 2–15       |
| Conifer                       | 24.4         | 1–50          | 5–20       |

\*Includes seedlings and saplings

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**Summary of Environmental Data**

**Aspect:** NE (7), NW (2), SW (2), variable (1)

**Macrotopography:** lower 1/3 of slope (1), lower to middle 1/3 of slope (4), lower to upper 1/3 of slope (1), middle 1/3 of slope (2), middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (3), convex (2), flat (3), undulating (3)

**Parent material:** Franciscan melange (2), peridotite (2), sandstone (1), serpentine (5), ultramafic (2)

**Soil texture:** clay or clay loam (5), loam or sandy loam (2), sand (2)

**Slope steepness:** moderate/6-25° (7), steep/>25° (5)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1456 ft. | 829–2210 ft. |
| <b>Slope</b>             | 22.5°    | 9–35°        |
| <b>Large rock cover</b>  | 9.3%     | 0–37%        |
| <b>Small rock cover</b>  | 14.9%    | 0–52%        |
| <b>Bare ground cover</b> | 8.6%     | 1–32%        |
| <b>Litter cover</b>      | 65.5%    | 8–93%        |

**Samples Used to Describe Association (n=12)**

**Rapid Assessments:** SERP0009, SONO0171, SONO0193, SONO0266, SONO0268, SONO0301, SONO0307, SONO0308, SONO0531, SONO2021

**Relevés:** SONO0187, SONO0682

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Hesperocyparis sargentii* / *Quercus durata* (Mesic) Provisional Association**

n = 11

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|--------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                   |     |      |      |      |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 100 | 24.3 | 10.0 | 50.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 55  | 8.9  | 0.2  | 22.0 |
|  | UMCA   | * <i>Umbellularia californica</i> | 27  | 5.0  | 2.0  | 7.0  |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 64  | 1.0  | 0.2  | 3.2  |
|  | UMCA   | * <i>Umbellularia californica</i> | 45  | 0.4  | 0.2  | 1.0  |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 36  | 2.0  | 0.2  | 7.2  |
| <b>Shrub</b>                           |        |                                   |     |      |      |      |
|  | QUDU4  | <i>Quercus durata</i>             | 64  | 11.2 | 0.2  | 26.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>    | 45  | 3.8  | 1.0  | 9.0  |
|  | FRCA12 | <i>Frangula californica</i>       | 36  | 0.9  | 0.2  | 3.0  |
|  | QUBE5  | <i>Quercus berberidifolia</i>     | 27  | 8.4  | 0.2  | 20.0 |
|  | ARBA4  | <i>Arctostaphylos bakeri</i>      | 27  | 1.7  | 0.2  | 3.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i> | 27  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |                                   |     |      |      |      |
|  | METO   | <i>Melica torreyana</i>           | 64  | 0.6  | 0.2  | 2.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Hesperocyparis sargentii* / *Quercus durata* (Mesic) Provisional Association**

n = 11

| Lifeform            | Code  | Botanical Name              | Con | Avg | Min | Max  |
|---------------------|-------|-----------------------------|-----|-----|-----|------|
| <b>Herb</b>         |       |                             |     |     |     |      |
|                     | IRMA  | <i>Iris macrosiphon</i>     | 45  | 2.4 | 0.2 | 6.0  |
|                     | POCA5 | <i>Polygala californica</i> | 36  | 0.2 | 0.2 | 0.2  |
|                     | CAREX | <i>Carex</i>                | 27  | 1.1 | 0.2 | 2.0  |
|                     | GAPO  | <i>Galium porrigens</i>     | 27  | 0.2 | 0.2 | 0.2  |
|                     | IRIS  | <i>Iris</i>                 | 27  | 0.2 | 0.2 | 0.2  |
| <b>Non-vascular</b> |       |                             |     |     |     |      |
|                     | 2MOSS | Moss                        | 82  | 4.4 | 0.2 | 18.0 |

**Noteworthy Taxa**

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G1/S1

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Hesperocyparis sargentii* Riparian Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 30.0         | 30            | –          |
| <b>Herb</b>                          | 3.0          | 3             | <0.5–0.5   |
| <b>Shrub</b>                         | 16.0         | 16            | 2–5        |
| <b>Regenerating/understory tree*</b> | 4.0          | 4             | 2–5        |
| <b>Hardwood</b>                      | 3.0          | 3             | 5–10       |
| <b>Conifer</b>                       | 22.0         | 22            | 10–15      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1)

**Macrotopography:** bottom (1)

**Microtopography:** flat (1)

**Parent material:** serpentine (1)

**Soil texture:** no data (1)

**Slope steepness:** flat/0° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 688 ft. | 688 ft. |
| <b>Slope</b>             | 0.0°    | 0°      |
| <b>Large rock cover</b>  | 18.0%   | 18%     |
| <b>Small rock cover</b>  | 35.0%   | 35%     |
| <b>Bare ground cover</b> | 37.0%   | 37%     |
| <b>Litter cover</b>      | 1.0%    | 1%      |

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**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO2214

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Hesperocyparis sargentii* Riparian Association**

n = 1

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            |             |  |            |            |            |            |
|  | HESA17      | * <i>Hesperocyparis sargentii</i>                  | 100        | 20.0       | 20.0       | 20.0       |
|  | UMCA        | * <i>Umbellularia californica</i>                  | 100        | 3.0        | 3.0        | 3.0        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                     | 100        | 2.0        | 2.0        | 2.0        |
|  | QUCH2       | <i>Quercus chrysolepis</i>                         | 100        | 1.0        | 1.0        | 1.0        |
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | UMCA        | * <i>Umbellularia californica</i>                  | 100        | 1.2        | 1.2        | 1.2        |
|  | HESA17      | * <i>Hesperocyparis sargentii</i>                  | 100        | 1.2        | 1.2        | 1.2        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                     | 100        | 0.4        | 0.4        | 0.4        |
|  | QUAG        | <i>Quercus agrifolia</i>                           | 100        | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | SABR2       | <i>Salix breweri</i>                               | 100        | 10.0       | 10.0       | 10.0       |
|  | RHOC        | <i>Rhododendron occidentale</i>                    | 100        | 3.0        | 3.0        | 3.0        |
|  | CAOC5       | <i>Calycanthus occidentalis</i>                    | 100        | 0.2        | 0.2        | 0.2        |
|  | FRCAT2      | <i>Frangula californica</i> ssp. <i>tomentella</i> | 100        | 0.2        | 0.2        | 0.2        |
|  | HEAR5       | <i>Heteromeles arbutifolia</i>                     | 100        | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | METO        | <i>Melica torreyana</i>                            | 100        | 0.2        | 0.2        | 0.2        |
|  | MUAN        | <i>Muhlenbergia andina</i>                         | 100        | 0.2        | 0.2        | 0.2        |
|  | ERSE8       | <i>Erigeron serpentinus</i>                        | 100        | 0.2        | 0.2        | 0.2        |
|  | CAAPM       | <i>Castilleja applegatei</i> ssp. <i>martinii</i>  | 100        | 0.2        | 0.2        | 0.2        |
|  | CAME5       | <i>Carex mendocinensis</i>                         | 100        | 0.2        | 0.2        | 0.2        |
|  | CACR29      | <i>Calliscirpus criniger</i>                       | 100        | 0.2        | 0.2        | 0.2        |
|  | PAPA8       | <i>Parnassia palustris</i>                         | 100        | 0.2        | 0.2        | 0.2        |
|  | EPGI        | <i>Epipactis gigantea</i>                          | 100        | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b>                    |             |  |            |            |            |            |
|  | 2ALGA       | Alga   | 100        | 2.0        | 2.0        | 2.0        |
|  | 2MOSS       | Moss   | 100        | 0.2        | 0.2        | 0.2        |

**Noteworthy Taxa**

*Erigeron serpentinus*

CA rare plant rank: 1B.3

NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Juglans hindsii* and Hybrids Special Stands and Semi-Natural Alliance**

### **Hinds's walnut and related stands**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Juglans hindsii* or hybrids are dominant in the tree canopy with *Populus fremontii*, *Quercus lobata*, and *Salix gooddingii*. Shrubs may include *Salix exigua* or *Sambucus nigra*.

Few things are certain about the natural distribution of this walnut since Richard Hinds found the tree scattered along the lower Sacramento River in 1837. Griffin and Critchfield (1972) mapped three natural stands in Contra Costa County, one natural stand in Solano County, and 13 stands that were questionable. The California Native Plant Society (CNPS) currently recognizes only three native stands of *J. hindsii* and assigns a Rare Plant Rank of 1B.1 to this tree.

Walnut growers in California use *J. hindsii* and backcrosses with either English walnut (*J. regia*) or three other North American black walnuts (*J. nigra*, *J. major*, and *J. californica*) as rootstock for English walnut orchards. These hybrids are resistant to several important soil-borne pests. Kirk (2003) considered most of the naturalized populations to be hybrids with *Juglans major*.

Many naturalized walnut populations occur along creeks and rivers in central and northern California, including the Sacramento River. Griffin and Critchfield (1972) reported natural-appearing stands of walnuts along the larger creeks and streams in the inner Coast Range foothills in Colusa, Glenn, and Tehama Counties. Vaghti (2003) found sufficient walnut trees along the Sacramento River to recognize a *Juglans hindsii* / *Sambucus nigra* forest type, but all of these appear to be naturalized. Cal-IPC does not rank the naturalized species as invasive.

#### Sonoma County

In Sonoma County, stands of *Juglans hindsii* are presumed to be hybrids.

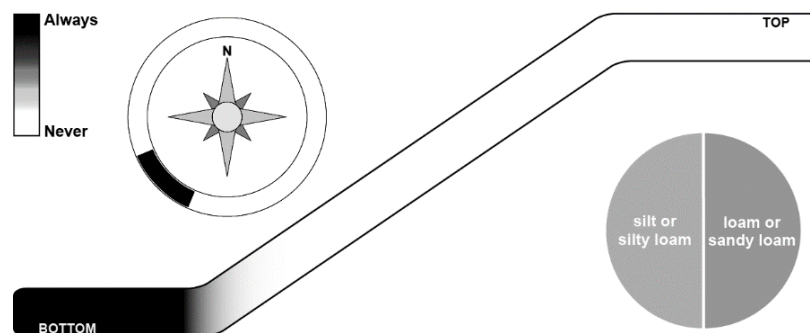
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#### **Local Alliance Summary (n = 3)**

**Elevation:** 51–515 ft, mean 207 ft

**SCV Global/State Rank:** G1/S1<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 86.7         | 66–98         | –          |
| <b>Herb</b>                          | 6.3          | 1–11          | <0.5–2     |
| <b>Shrub</b>                         | 57.1         | 0.2–96        | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 4.1          | 0.2–10        | <0.5–15    |
| <b>Hardwood</b>                      | 51.7         | 45–65         | 15–35      |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 1.5°  | 1–2°  |
| <b>Large rock cover</b>  | 0.3%  | 0–1%  |
| <b>Small rock cover</b>  | 5.0%  | 0–12% |
| <b>Bare ground cover</b> | 42.0% | 5–81% |
| <b>Litter cover</b>      | 51.0% | 5–93% |

**Associations within this Alliance:** none

**STAND TABLE**

***Juglans hindsii* and Hybrids Special Stands and Semi-Natural Alliance**

n = 3

| Lifeform                               | Code   | Botanical Name                            | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | JUHI   | * <i>Juglans hindsii</i>                  | 100 | 40.0 | 30.0 | 60.0 |
|  | ACNE2  | * <i>Acer negundo</i>                     | 67  | 17.5 | 15.0 | 20.0 |
|  | UMCA   | * <i>Umbellularia californica</i>         | 67  | 8.0  | 6.0  | 10.0 |
|  | ACMA3  | <i>Acer macrophyllum</i>                  | 33  | 0.2  | 0.2  | 0.2  |
|  | FRLA   | <i>Fraxinus latifolia</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|  | PRUNU  | * <i>Prunus</i>                           | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | JUHI   | * <i>Juglans hindsii</i>                  | 67  | 3.1  | 1.0  | 5.2  |
|  | ACNE2  | * <i>Acer negundo</i>                     | 67  | 3.0  | 1.0  | 5.0  |
|  | UMCA   | * <i>Umbellularia californica</i>         | 67  | 1.1  | 0.2  | 2.0  |
|  | PRUNU  | * <i>Prunus</i>                           | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | RUAR9  | <i>Rubus armeniacus</i>                   | 67  | 25.5 | 1.0  | 50.0 |
|  | RUUR   | <i>Rubus ursinus</i>                      | 33  | 45.0 | 45.0 | 45.0 |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 33  | 3.0  | 3.0  | 3.0  |
|  | GEMO2  | <i>Genista monspessulana</i>              | 33  | 0.2  | 0.2  | 0.2  |
|  | SYAL   | <i>Symphoricarpos albus</i>               | 33  | 0.2  | 0.2  | 0.2  |
|  | TODI   | <i>Toxicodendron diversilobum</i>         | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | HEHE   | <i>Hedera helix</i>                       | 67  | 22.6 | 0.2  | 45.0 |
|  | URDI   | <i>Urtica dioica</i>                      | 33  | 10.0 | 10.0 | 10.0 |
|  | CYEC   | <i>Cynosurus echinatus</i>                | 33  | 3.0  | 3.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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**STAND TABLE** continued

*Juglans hindsii* and Hybrids Special Stands and Semi-Natural Alliance

n = 3

| Lifeform            | Code  | Botanical Name                              | Con | Avg | Min | Max |
|---------------------|-------|---|-----|-----|-----|-----|
| <b>Herb</b>         |       |   |     |     |     |     |
|                     | VIMA  | <i>Vinca major</i>                          | 33  | 2.0 | 2.0 | 2.0 |
|                     | CAPY2 | <i>Carduus pycnocephalus</i>                | 33  | 1.0 | 1.0 | 1.0 |
|                     | HORDE | <i>Hordeum</i>                              | 33  | 1.0 | 1.0 | 1.0 |
|                     | ARDO4 | <i>Arundo donax</i>                         | 33  | 0.2 | 0.2 | 0.2 |
|                     | BRDI3 | <i>Bromus diandrus</i>                      | 33  | 0.2 | 0.2 | 0.2 |
|                     | CAREX | <i>Carex</i>                                | 33  | 0.2 | 0.2 | 0.2 |
|                     | CIRSI | <i>Cirsium</i>                              | 33  | 0.2 | 0.2 | 0.2 |
|                     | CYER  | <i>Cyperus eragrostis</i>                   | 33  | 0.2 | 0.2 | 0.2 |
|                     | GALIU | <i>Galium</i>                               | 33  | 0.2 | 0.2 | 0.2 |
|                     | JUEFP | <i>Juncus effusus</i> var. <i>pacificus</i> | 33  | 0.2 | 0.2 | 0.2 |
|                     | TOAR  | <i>Torilis arvensis</i>                     | 33  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |       |   |     |     |     |     |
|                     | 2MOSS | Moss  | 67  | 0.2 | 0.2 | 0.2 |

## ***Notholithocarpus densiflorus* Alliance**

### **Tanoak forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Notholithocarpus densiflorus* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Alnus rubra*, *Arbutus menziesii*, *Calocedrus decurrens*, *Chamaecyparis lawsoniana*, *Chrysolepis chrysophylla*, *Cornus nuttallii*, *Pinus coulteri*, *Pinus lambertiana*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus kelloggii*, *Sequoia sempervirens*, *Torreya californica*, *Tsuga heterophylla*, and *Umbellularia californica*.

Stands of this alliance and others that contain *N. densiflorus* are often referred to as mixed evergreen forest (Sawyer 2006, 2007), but Bingham's (1999) study found that stands dominated by *N. densiflorus* differed significantly in species composition and environmental conditions from stands containing *N. densiflorus* with other evergreens. Cooper's (1922) original concept of the mixed evergreen forest described mixed hardwood stands in the Santa Lucia Mountains. Munz (1959) and Whittaker (1960) expanded the term "mixed evergreen" to include *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* stands. Forest ecologists have used the name "*Lithocarpus densiflorus* series" or "*Notholithocarpus densiflorus* Alliance" to refer to stands that have a low to moderate presence of conifers, such as *Pseudotsuga menziesii* or *Sequoia sempervirens* (e.g., Atzet and Wheeler 1982, Jimerson et al. 1996). The National Vegetation Classification (NVC) places such stands in the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* or *Sequoia sempervirens* Alliances. Our concept of the *Notholithocarpus densiflorus* Alliance is one with minimal conifer cover and the main cover provided by tanoak with a variable proportion of other hardwoods. The shrub form of *Notholithocarpus densiflorus* (var. *echinoides*) has its own alliance.

### Sonoma County

Sudden oak death (*Phytophthora ramorum*) has decimated many stands of this alliance throughout much of coastal and central parts of Sonoma County. High elevation stands near Mt. Saint Helena, which are above the summer fog level, have not been affected as of 2014.

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### **Local Alliance Summary (n = 16)**

**Elevation:** 425–2443 ft, mean 1401 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

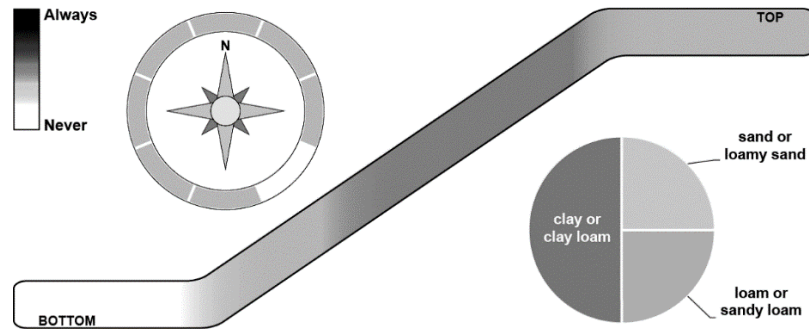
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<sup>1</sup> All citations for the "Statewide" section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 67.8         | 35–90         | –          |
| <b>Herb</b>                          | 0.4          | 0–2           | <0.5–1     |
| <b>Shrub</b>                         | 2.1          | 0–15          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 15.7         | 1–60          | 0.5–20     |
| <b>Hardwood</b>                      | 53.1         | 24–85         | 5–35       |
| <b>Conifer</b>                       | 5.6          | 0–20          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 21.7° | 2–35° |
| <b>Large rock cover</b>  | 0.2%  | 0–1%  |
| <b>Small rock cover</b>  | 3.0%  | 0–10% |
| <b>Bare ground cover</b> | 13.1% | 0–88% |
| <b>Litter cover</b>      | 81.2% | 9–94% |

**Associations within this Alliance:**

- Notholithocarpus densiflorus* – *Arbutus menziesii* Association
- Notholithocarpus densiflorus* Provisional Association

**STAND TABLE**

***Notholithocarpus densiflorus* Alliance**

n = 16

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|--|-------|---------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                       |     |      |      |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 47.6 | 24.0 | 80.0 |
|  | ARME  | * <i>Arbutus menziesii</i>            | 63  | 9.2  | 1.0  | 20.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 56  | 4.8  | 0.2  | 10.0 |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 50  | 4.0  | 0.2  | 8.0  |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |      |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 14.6 | 0.2  | 60.2 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 69  | 1.0  | 0.2  | 5.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Notholithocarpus densiflorus* Alliance**

n = 16

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg | Min | Max |
|--|--------|--|-----|-----|-----|-----|
| <b>Regenerating or Understory Tree</b> |        |  |     |     |     |     |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 50  | 0.8 | 0.2 | 3.0 |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 44  | 0.6 | 0.2 | 1.2 |
|  | UMCA   | <i>Umbellularia californica</i>                  | 44  | 0.3 | 0.2 | 0.4 |
| <b>Shrub</b>                           |        |  |     |     |     |     |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 50  | 1.1 | 0.2 | 7.0 |
| <b>Herb</b>                            |        |  |     |     |     |     |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 56  | 0.2 | 0.2 | 0.2 |
|  | CAREX  | <i>Carex</i>                                     | 31  | 0.2 | 0.2 | 0.2 |
|  | POCA5  | <i>Polygala californica</i>                      | 25  | 0.2 | 0.2 | 0.2 |
|  | WHMO   | <i>Whipplea modesta</i>                          | 25  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b>                    |        |  |     |     |     |     |
|  | 2MOSS  | Moss   | 88  | 1.3 | 0.2 | 5.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Notholithocarpus densiflorus* – *Arbutus menziesii* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 67.8         | 50–90         | –          |
| <b>Herb</b>                          | 0.2          | 0–0           | <0.5–1     |
| <b>Shrub</b>                         | 2.1          | 0–7           | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 9.0          | 3–20          | 2–10       |
| <b>Hardwood</b>                      | 60.3         | 45–85         | 15–35      |
| <b>Conifer</b>                       | 5.7          | 0–20          | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (1), SW (3)

**Macrotopography:** middle 1/3 of slope (1), upper 1/3 of slope (4), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (2), flat (2), undulating (1)

**Parent material:** Franciscan melange (2), sedimentary (2), volcanic (2)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6–25° (5), steep/>25° (1)

|                  | Mean     | Range         |
|------------------|----------|---------------|
| <b>Elevation</b> | 1951 ft. | 1419–2443 ft. |
| <b>Slope</b>     | 21.2°    | 8–35°         |

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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Large rock cover  | 0.1%  | 0–0.4% |
| Small rock cover  | 3.3%  | 0–7%   |
| Bare ground cover | 7.3%  | 0–20%  |
| Litter cover      | 87.3% | 78–93% |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0191, SONO0251, SONO0720, SONO0831, SONO0832, SONO2027  
**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Notholithocarpus densiflorus* – *Arbutus menziesii* Association**

n = 6

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 100 | 46.5 | 25.0 | 80.0 |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 100 | 13.8 | 4.0  | 20.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 67  | 5.0  | 3.0  | 8.0  |
|  | PIPO   | <i>Pinus ponderosa</i>                           | 33  | 7.1  | 0.2  | 14.0 |
|  | ACMA3  | <i>Acer macrophyllum</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|  | UMCA   | * <i>Umbellularia californica</i>                | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 100 | 7.8  | 0.2  | 19.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 83  | 1.6  | 0.2  | 5.2  |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 67  | 0.8  | 0.2  | 1.2  |
|  | UMCA   | * <i>Umbellularia californica</i>                | 67  | 0.3  | 0.2  | 0.4  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 50  | 2.5  | 0.2  | 7.0  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 83  | 1.5  | 0.2  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Notholithocarpus densiflorus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (10) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 67.8         | 35–90         | –          |
| Herb             | 0.5          | 0–2           | <0.5–1     |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Shrub</b>                         | 2.2          | 0–15          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 19.7         | 1–60          | 0.5–20     |
| <b>Hardwood</b>                      | 48.8         | 24–81         | 5–35       |
| <b>Conifer</b>                       | 5.6          | 0–18          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (4), SW (3)

**Macrotopography:** lower 1/3 of slope (2), lower to middle 1/3 of slope (1), middle 1/3 of slope (4), middle to upper 1/3 of slope (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (5), flat (2), undulating (3)

**Parent material:** Franciscan melange (4), greenstone (1), sandstone (3), sandy alluvium (1), siltstone (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1), sand (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (5), steep/>25° (4)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1071 ft. | 425–1835 ft. |
| <b>Slope</b>             | 22.0°    | 2–32°        |
| <b>Large rock cover</b>  | 0.2%     | 0–1%         |
| <b>Small rock cover</b>  | 2.8%     | 0–10%        |
| <b>Bare ground cover</b> | 16.6%    | 2–88%        |
| <b>Litter cover</b>      | 77.5%    | 9–94%        |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** SONO0146, SONO0529, SONO0613, SONO0630, SONO0954, SONO0969, SONO0995, SONO2190

**Relevés:** SONO0041, SONO0125

**SCV Global/State Rank:** G3?/S2?¹

**STAND TABLE**

***Notholithocarpus densiflorus* Provisional Association**

n = 10

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|--|-------|---------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                       |     |      |      |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 48.3 | 24.0 | 80.0 |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 70  | 4.6  | 1.0  | 8.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 50  | 4.7  | 0.2  | 10.0 |
|  | ARME  | * <i>Arbutus menziesii</i>            | 40  | 2.3  | 1.0  | 3.0  |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |      |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 18.6 | 1.2  | 60.2 |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 70  | 0.8  | 0.2  | 3.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 60  | 0.4  | 0.2  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Notholithocarpus densiflorus* Provisional Association**

n = 10

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | ARME        | * <i>Arbutus menziesii</i>                       | 30         | 0.5        | 0.2        | 1.0        |
|  | UMCA        | <i>Umbellularia californica</i>                  | 30         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i>                | 50         | 0.2        | 0.2        | 0.2        |
|  | VAOV2       | <i>Vaccinium ovatum</i>                          | 20         | 4.0        | 2.0        | 6.0        |
|  | ROGY        | <i>Rosa gymnocarpa</i>                           | 20         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 60         | 0.2        | 0.2        | 0.2        |
|  | CAREX       | <i>Carex</i>                                     | 40         | 0.2        | 0.2        | 0.2        |
|  | POCA5       | <i>Polygala californica</i>                      | 40         | 0.2        | 0.2        | 0.2        |
|  | WHMO        | <i>Whipplea modesta</i>                          | 40         | 0.2        | 0.2        | 0.2        |
|  | POMU        | <i>Polystichum munitum</i>                       | 30         | 0.2        | 0.2        | 0.2        |
|  | PRHO2       | <i>Prosartes hookeri</i>                         | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b>                    |             |  |            |            |            |            |
|  | 2MOSS       | Moss   | 90         | 1.2        | 0.2        | 5.0        |
|  | 2LICHN      | Lichen   | 20         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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## ***Pinus attenuata* Alliance**

### **Knobcone pine forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Pinus attenuata* is dominant or co-dominant in the tree canopy with *Arbutus menziesii*, *Juniperus occidentalis*, *Notholithocarpus densiflorus*, *Pinus contorta*, *Pinus coulteri*, *Pinus monticola*, *Pinus radiata*, *Pinus sabiniana*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, and *Quercus wislizeni*.

Stands of *Pinus attenuata* typically occur on nutrient-deficient soils with and without dense understories (Minnich 2007). They tend to vary regionally in size and occurrence; the trees in many stands are dense, forming closed canopies, while in other stands, trees are scattered and canopies are open. Associated vegetation is often chaparral, but in some regions, the surrounding vegetation includes coniferous forests, montane chaparral, and oak woodlands. Individual *Pinus attenuata* trees often emerge through shrub canopies in stands of many chaparral alliances.

### Sonoma County

In Sonoma County, the *Pinus attenuata* Alliance is usually associated with extensive stands of chaparral and is less often associated with *Pseudotsuga menziesii* and several species of *Quercus*. Some *Pinus attenuata* stands are located on serpentine.

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### **Local Alliance Summary (n = 12)**

**Elevation:** 731–3718 ft, mean 2061 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

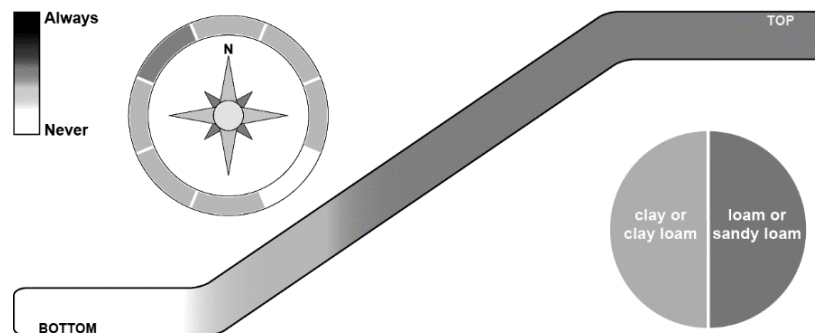
#### **Noteworthy Taxa**

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe global/state rank: G1/S1

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 63.1         | 40–80         | –          |
| <b>Herb</b>                          | 4.1          | 0–32          | <0.5–1     |
| <b>Shrub</b>                         | 30.3         | 7–45          | 1–5        |
| <b>Regenerating/understory tree*</b> | 20.6         | 0–58          | 2–10       |
| <b>Hardwood</b>                      | 0.3          | 0–2           | 1–10       |
| <b>Conifer</b>                       | 12.9         | 0–30          | 2–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.3° | 7–26°  |
| <b>Large rock cover</b>  | 0.3%  | 0–2%   |
| <b>Small rock cover</b>  | 8.1%  | 0–24%  |
| <b>Bare ground cover</b> | 7.5%  | 1–30%  |
| <b>Litter cover</b>      | 81.3% | 61–96% |

**Associations within this Alliance:**

*Pinus attenuata* / *Arctostaphylos* (*manzanita*, *canescens*) Provisional Association  
*Pinus attenuata* / *Arctostaphylos viscida* Association

**STAND TABLE**

***Pinus attenuata* Alliance**

n = 12

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PIAT   | * <i>Pinus attenuata</i>                            | 75  | 31.2 | 13.0 | 62.0 |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | UMCA   | <i>Umbellularia californica</i>                     | 42  | 8.1  | 0.2  | 28.2 |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 42  | 1.0  | 0.2  | 3.0  |
|  | PIAT   | * <i>Pinus attenuata</i>                            | 33  | 29.6 | 0.2  | 55.0 |
|  | ARME   | <i>Arbutus menziesii</i>                            | 25  | 1.8  | 0.2  | 5.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ARCA5  | <i>Arctostaphylos canescens</i>                     | 33  | 19.6 | 0.2  | 40.0 |
|  | CECU   | <i>Ceanothus cuneatus</i>                           | 33  | 12.8 | 1.0  | 30.0 |
|  | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>     | 33  | 3.1  | 0.2  | 6.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 33  | 1.9  | 0.2  | 4.0  |
|  | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>      | 25  | 1.5  | 0.2  | 4.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                     | 25  | 0.5  | 0.2  | 1.0  |
|  | FRCAC5 | <i>Frangula californica</i> ssp. <i>californica</i> | 25  | 0.5  | 0.2  | 1.0  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 25  | 0.2  | 0.2  | 0.2  |

**Noteworthy Taxa**

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe global/state rank: G1/S1

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Pinus attenuata* / *Arctostaphylos (manzanita, canescens)* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (3) and Mount St. Helena Flows and Valleys/263Am (5) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 56.3         | 40–73         | –          |
| <b>Herb</b>                          | 0.6          | 0–2           | <0.5–0.5   |
| <b>Shrub</b>                         | 33.1         | 7–45          | 1–5        |
| <b>Regenerating/understory tree*</b> | 21.9         | 0–58          | 2–10       |
| <b>Hardwood</b>                      | 0.1          | 0–1           | 1–2        |
| <b>Conifer</b>                       | 10.8         | 0–20          | 2–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (2), SW (3), variable (1)

**Macrotopography:** middle 1/3 of slope (3), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (4)

**Microtopography:** concave (1), convex (7)

**Parent material:** sandstone (1), serpentine (2), volcanic (5)

**Soil texture:** clay or clay loam (2), loam or sandy loam (2)

**Slope steepness:** moderate/6–25° (8)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 2386 ft. | 1786–3718 ft. |
| <b>Slope</b>             | 14.9°    | 7–21°         |
| <b>Large rock cover</b>  | 0.3%     | 0–2%          |
| <b>Small rock cover</b>  | 8.8%     | 0–24%         |
| <b>Bare ground cover</b> | 7.1%     | 1–30%         |
| <b>Litter cover</b>      | 80.7%    | 61–96%        |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** SONO0043, SONO0166, SONO0178, SONO0696, SONO0705, SONO0709, SONO0940, SONO1102

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE**

***Pinus attenuata* / *Arctostaphylos (manzanita, canescens)* Provisional Association**

n = 8

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PIAT   | * <i>Pinus attenuata</i>                                  | 63  | 15.8 | 13.0 | 20.0 |
|  | 2SNAG  | Standing snag   | 25  | 1.0  | 1.0  | 1.0  |
|  | QUERC  | <i>Quercus</i>  | 25  | 0.2  | 0.2  | 0.2  |
|  | UMCA   | <i>Umbellularia californica</i>                           | 63  | 8.1  | 0.2  | 28.2 |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PSME   | <i>Pseudotsuga menziesii</i>                              | 50  | 0.5  | 0.2  | 1.2  |
|  | PIAT   | * <i>Pinus attenuata</i>                                  | 38  | 39.3 | 28.0 | 55.0 |
|  | ARME   | <i>Arbutus menziesii</i>                                  | 25  | 2.6  | 0.2  | 5.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ARCA5  | <i>Arctostaphylos canescens</i>                           | 50  | 19.6 | 0.2  | 40.0 |
|  | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>           | 50  | 3.1  | 0.2  | 6.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                            | 38  | 2.4  | 0.2  | 4.0  |
|  | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>            | 38  | 1.5  | 0.2  | 4.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                           | 38  | 0.5  | 0.2  | 1.0  |
|  | FRCAC5 | <i>Frangula californica</i> ssp. <i>californica</i>       | 38  | 0.5  | 0.2  | 1.0  |
|  | ARMAG  | * <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 25  | 21.5 | 3.0  | 40.0 |
|  | ARMA   | * <i>Arctostaphylos manzanita</i>                         | 25  | 18.0 | 1.0  | 35.0 |
|  | CECU   | <i>Ceanothus cuneatus</i>                                 | 25  | 15.5 | 1.0  | 30.0 |
|  | ARST   | <i>Arctostaphylos stanfordiana</i>                        | 25  | 4.5  | 4.0  | 5.0  |
|  | CECO6  | <i>Ceanothus confusus</i>                                 | 25  | 0.6  | 0.2  | 1.0  |
|  | CEFO   | <i>Ceanothus foliosus</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | ROSA5  | <i>Rosa</i>   | 25  | 0.2  | 0.2  | 0.2  |
|  | ARMAM2 | * <i>Arctostaphylos manzanita</i> ssp. <i>manzanita</i>   | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | IRIS   | <i>Iris</i>   | 25  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 25  | 0.2  | 0.2  | 0.2  |

**Noteworthy Taxa**

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G1/S1

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Pinus attenuata* / *Arctostaphylos viscida* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation and Environmental Data**

**Total vegetation cover:** range 70–80%, mean 75.0%

**Aspect:** NW (2)

**Macrotopography:** lower to middle 1/3 of slope (1), middle to upper 1/3 of slope (1)

**Microtopography:** convex (1), undulating (1)

**Summary of Vegetation and Environmental Data, continued**

**Parent material:** serpentine (2)

**Soil texture:** no data (2)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1)

**Elevation:** range 2058–2106 ft., mean 2082 ft.

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SERP0012, SERP0014

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Pinus attenuata* / *Arctostaphylos viscida* Association**

n = 2

| Lifeform     | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|--------------|-------|--|-----|------|------|------|
| <b>Tree</b>  |       |  |     |      |      |      |
|              | PIAT  | <i>Pinus attenuata</i>                         | 100 | 56.0 | 50.0 | 62.0 |
|              | ARME  | <i>Arbutus menziesii</i>                       | 50  | 32.0 | 32.0 | 32.0 |
|              | QUGA4 | <i>Quercus garryana</i>                        | 50  | 20.0 | 20.0 | 20.0 |
|              | PSME  | <i>Pseudotsuga menziesii</i>                   | 50  | 5.0  | 5.0  | 5.0  |
|              | QUKE  | <i>Quercus kelloggii</i>                       | 50  | 4.0  | 4.0  | 4.0  |
| <b>Shrub</b> |       |  |     |      |      |      |
|              | ARVI4 | <i>Arctostaphylos viscida</i>                  | 100 | 22.5 | 20.0 | 25.0 |
|              | CECU  | <i>Ceanothus cuneatus</i>                      | 100 | 10.0 | 5.0  | 15.0 |
|              | ADFA  | <i>Adenostoma fasciculatum</i>                 | 50  | 20.0 | 20.0 | 20.0 |
|              | CEMOG | <i>Cercocarpus montanus</i> var. <i>glaber</i> | 50  | 2.0  | 2.0  | 2.0  |
| <b>Herb</b>  |       |  |     |      |      |      |
|              | FECA  | <i>Festuca californica</i>                     | 100 | 3.5  | 2.0  | 5.0  |
|              | ELMU3 | <i>Elymus multisetus</i>                       | 50  | 5.0  | 5.0  | 5.0  |
|              | RACA2 | <i>Ranunculus californicus</i>                 | 50  | 4.0  | 4.0  | 4.0  |
|              | AGOSE | <i>Agoseris</i>                                | 50  | 3.0  | 3.0  | 3.0  |
|              | BRDI3 | <i>Bromus diandrus</i>                         | 50  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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***Pinus muricata* Alliance**  
**Bishop pine forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Pinus muricata* is dominant or co-dominant in the tree canopy with *Abies grandis*, *Arbutus menziesii*, *Hesperocyparis pigmaea*, *Notholithocarpus densiflorus*, *Pinus contorta* ssp. *bolanderi*, *Pinus contorta* ssp. *contorta*, *Pinus radiata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus tomentella*, *Sequoia sempervirens*, *Tsuga heterophylla*, and *Umbellularia californica*.

*Pinus muricata* grows on the mainland from Santa Barbara to Humboldt Counties, as well as on the Santa Cruz and Santa Rosa islands (Barbour 2007). It grows in areas with spring and summer fog, which is important to its survival (Cope 1993e). In the La Purisima Hills in Santa Barbara County, *Pinus muricata* stands occur on diatomaceous mudstone and are surrounded by chaparral (Cole 1980, Vogl et al. 1977). Those in the western Santa Ynez Mountains and near Erendira in Baja California also exist in chaparral. *Pinus muricata* stands on the Channel Islands differ in species composition from one another and from stands on the mainland (Philbrick and Haller 1977). In Humboldt and Mendocino Counties, *P. muricata* commonly occurs on shallow, poorly drained soils and mixes with *Hesperocyparis pigmaea*, *Pinus contorta*, *Pseudotsuga menziesii*, and *Sequoia sempervirens* (Westman and Whittaker 1975).

Sonoma County

In Sonoma County, *Pinus muricata* stands are extensive on coastal terraces near Salt Point and Ft. Ross State Parks. They also occur on nutrient-poor sandstone uplands on Gualala Ridge, mixed with maritime chaparral and pygmy forests of *Hesperocyparis pigmaea*.

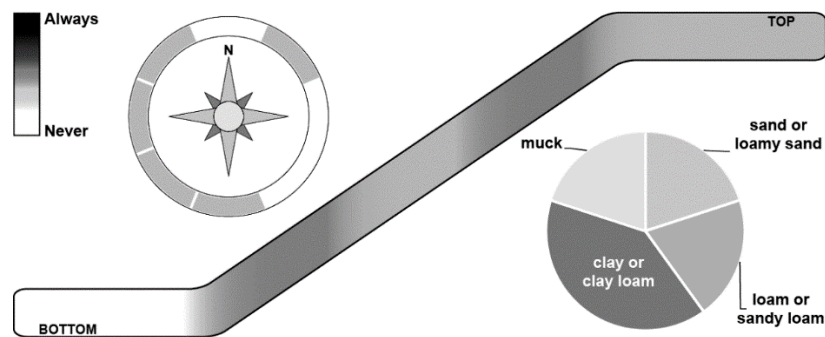
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**Local Alliance Summary (n = 11)**

**Elevation:** 95–977 ft, mean 437 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 71.4         | 42–95         | –          |
| <b>Herb</b>                          | 9.7          | 0–35          | <0.5–2     |
| <b>Shrub</b>                         | 23.0         | 1–95          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 2.1          | 0–8           | <0.5–5     |
| <b>Hardwood</b>                      | 1.7          | 0–12          | 2–20       |
| <b>Conifer</b>                       | 39.5         | 0–85          | 2–35       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 6.5°  | 1–20°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.9%  | 0–5%   |
| <b>Bare ground cover</b> | 3.4%  | 0–13%  |
| <b>Litter cover</b>      | 90.9% | 81–97% |

**Associations within this Alliance:**

*Pinus muricata* – *Hesperocyparis pigmaea* Provisional Association

*Pinus muricata* / *Vaccinium ovatum* Provisional Association

*Pinus muricata* Provisional Association

**STAND TABLE**

***Pinus muricata* Alliance**

n = 11

| Lifeform                               | Code   | Botanical Name                                    | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PIMU   | * <i>Pinus muricata</i>                           | 100 | 35.8 | 10.0 | 85.0 |
|  | HEPI11 | <i>Hesperocyparis pigmaea</i>                     | 27  | 8.4  | 0.2  | 15.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                    | 27  | 3.7  | 2.0  | 5.0  |
|  | SESE3  | <i>Sequoia sempervirens</i>                       | 27  | 1.4  | 0.2  | 2.0  |
|  | 2SNAG  | Standing snag                                     | 27  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PIMU   | * <i>Pinus muricata</i>                           | 73  | 1.3  | 0.2  | 6.0  |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>               | 45  | 1.8  | 0.2  | 6.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                    | 45  | 0.6  | 0.2  | 2.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | VAOV2  | <i>Vaccinium ovatum</i>                           | 73  | 17.5 | 0.2  | 45.0 |
|  | GASH   | <i>Gaultheria shallon</i>                         | 45  | 13.8 | 1.0  | 45.0 |
|  | RUUR   | <i>Rubus ursinus</i>                              | 45  | 2.2  | 0.2  | 4.0  |
|  | ARCO3  | <i>Arctostaphylos columbiana</i>                  | 45  | 2.1  | 0.2  | 5.0  |
|  | ARNU3  | <i>Arctostaphylos nummularia</i>                  | 36  | 29.6 | 6.0  | 51.2 |
|  | MOCA6  | <i>Morella californica</i>                        | 36  | 2.0  | 1.0  | 5.0  |
|  | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i> | 36  | 1.9  | 1.0  | 3.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 73  | 1.4  | 0.2  | 6.0  |
|  | HOLA   | <i>Holcus lanatus</i>                             | 36  | 1.4  | 0.2  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

*Pinus muricata* Alliance

n = 11

| Lifeform     | Code   | Botanical Name             | Con | Avg | Min | Max |
|--------------|--------|----------------------------|-----|-----|-----|-----|
| Herb         | POMU   | <i>Polystichum munitum</i> | 36  | 0.2 | 0.2 | 0.2 |
| Non-vascular |        |                            |     |     |     |     |
|              | 2MOSS  | Moss                       | 36  | 0.4 | 0.2 | 1.0 |
|              | 2LICHN | Lichen                     | 27  | 0.5 | 0.2 | 1.0 |

***Pinus muricata* – *Hesperocyparis pigmaea* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 95.0         | 95–95         | –          |
| Herb                          | 0.0          | 0–0           | –          |
| Shrub                         | 95.0         | 95–95         | 1–2        |
| Regenerating/understory tree* | 0.5          | 0–1           | –          |
| Hardwood                      | 7.0          | 2–12          | 2–5        |
| Conifer                       | 10.1         | 0–20          | 2–5        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), NE (1), SW (1)

**Macrotopography:** ridge top (1), upper 1/3 of slope to ridgetop (2)

**Microtopography:** flat (1), linear or even (1), undulating (1)

**Parent material:** sandstone (1), sedimentary (2)

**Soil texture:** sand (1)

**Slope steepness:** gentle/1-5° (3)

|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 840 ft. | 622–951 ft. |
| Slope             | 2.0°    | 1–3°        |
| Large rock cover  | 0.0%    | 0–0%        |
| Small rock cover  | 3.1%    | 1–5%        |
| Bare ground cover | 2.1%    | 0–5%        |
| Litter cover      | 86.3%   | 81–93%      |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** DKYRE004, DKYRE005, SONO0163

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Pinus muricata* – *Hesperocyparis pigmaea* Provisional Association**

n = 3

| Lifeform                               | Code   | Botanical Name                                    | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PIMU   | * <i>Pinus muricata</i>                           | 100 | 10.7 | 10.0 | 12.0 |
|  | HEPI11 | * <i>Hesperocyparis pigmaea</i>                   | 100 | 8.4  | 0.2  | 15.0 |
|  | SESE3  | * <i>Sequoia sempervirens</i>                     | 67  | 1.1  | 0.2  | 2.0  |
|  | 2SNAG  | Standing snag                                     | 67  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PIMU   | * <i>Pinus muricata</i>                           | 67  | 0.3  | 0.2  | 0.4  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                      | 33  | 0.2  | 0.2  | 0.2  |
|  | SESE3  | * <i>Sequoia sempervirens</i>                     | 33  | 0.2  | 0.2  | 0.2  |
|  | HEPI11 | * <i>Hesperocyparis pigmaea</i>                   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ARNU3  | <i>Arctostaphylos nummularia</i>                  | 100 | 37.4 | 26.0 | 51.2 |
|  | VAOV2  | <i>Vaccinium ovatum</i>                           | 100 | 29.0 | 15.0 | 45.0 |
|  | GASH   | <i>Gaultheria shallon</i>                         | 100 | 16.4 | 1.0  | 45.0 |
|  | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i> | 100 | 2.1  | 1.2  | 3.2  |
|  | ARCO3  | <i>Arctostaphylos columbiana</i>                  | 100 | 1.8  | 0.2  | 5.0  |
|  | RHMA3  | <i>Rhododendron macrophyllum</i>                  | 67  | 3.2  | 2.2  | 4.2  |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                  | 67  | 0.2  | 0.2  | 0.2  |
|  | LEGL   | <i>Ledum glandulosum</i>                          | 67  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 67  | 0.2  | 0.2  | 0.2  |
|  | XETE   | <i>Xerophyllum tenax</i>                          | 67  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2LICHN | Lichen  | 33  | 1.0  | 1.0  | 1.0  |
|  | 2MOSS  | Moss  | 33  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Pinus muricata* / *Vaccinium ovatum* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.8         | 63–85         | –          |
| <b>Herb</b>                          | 12.3         | 2–35          | 0.5–2      |
| <b>Shrub</b>                         | 24.0         | 4–48          | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.8          | 0–8           | 1–5        |
| <b>Hardwood</b>                      | 0.8          | 0–2           | 15–20      |
| <b>Conifer</b>                       | 37.3         | 15–54         | 15–35      |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data**

**Aspect:** NW (1), SW (3)  
**Macrotopography:** lower 1/3 of slope (2), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)  
**Microtopography:** convex (1), flat (3)  
**Parent material:** mixed sedimentary (1), sandstone (2), sedimentary (1)  
**Soil texture:** muck (1)  
**Slope steepness:** gentle/1-5° (2), moderate/6-25° (2)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 436 ft. | 95–977 ft. |
| <b>Slope</b>             | 5.8°    | 2–12°      |
| <b>Large rock cover</b>  | 0.0%    | 0–0%       |
| <b>Small rock cover</b>  | 0.3%    | 0–1%       |
| <b>Bare ground cover</b> | 3.5%    | 0–8%       |
| <b>Litter cover</b>      | 92.8%   | 90–97%     |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0464, SONO0724, SONO0733  
**Relevés:** SONO0027

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Pinus muricata* / *Vaccinium ovatum* Provisional Association**

n = 4

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|--|-------|---------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                       |     |      |      |      |
|  | PIMU  | * <i>Pinus muricata</i>               | 100 | 35.3 | 15.0 | 50.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 50  | 3.0  | 2.0  | 4.0  |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 50  | 1.0  | 1.0  | 1.0  |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 25  | 2.0  | 2.0  | 2.0  |
|  | ABGR  | * <i>Abies grandis</i>                | 25  | 0.2  | 0.2  | 0.2  |
|  | ARME  | * <i>Arbutus menziesii</i>            | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |      |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 75  | 2.8  | 0.4  | 6.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 50  | 1.2  | 0.4  | 2.0  |
|  | ABGR  | * <i>Abies grandis</i>                | 50  | 0.4  | 0.4  | 0.4  |
|  | PIMU  | * <i>Pinus muricata</i>               | 50  | 0.3  | 0.2  | 0.4  |
|  | ARME  | * <i>Arbutus menziesii</i>            | 25  | 0.4  | 0.4  | 0.4  |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 25  | 0.4  | 0.4  | 0.4  |
| <b>Shrub</b>                           |       |                                       |     |      |      |      |
|  | VAOV2 | <i>Vaccinium ovatum</i>               | 100 | 13.3 | 3.0  | 35.0 |
|  | GASH  | <i>Gaultheria shallon</i>             | 50  | 10.0 | 3.0  | 17.0 |
|  | RUUR  | <i>Rubus ursinus</i>                  | 50  | 3.5  | 3.0  | 4.0  |
|  | ARCO3 | <i>Arctostaphylos columbiana</i>      | 50  | 2.6  | 0.2  | 5.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Pinus muricata* / *Vaccinium ovatum* Provisional Association**

n = 4

| Lifeform            | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Shrub</b>        |        |   |     |      |      |      |
|                     | MOCA6  | <i>Morella californica</i>                          | 50  | 1.0  | 1.0  | 1.0  |
|                     | ARNU3  | <i>Arctostaphylos nummularia</i>                    | 25  | 6.0  | 6.0  | 6.0  |
|                     | FRCA12 | <i>Frangula californica</i>                         | 25  | 6.0  | 6.0  | 6.0  |
|                     | RHOC   | <i>Rhododendron occidentale</i>                     | 25  | 3.0  | 3.0  | 3.0  |
|                     | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i>   | 25  | 1.0  | 1.0  | 1.0  |
|                     | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 25  | 0.2  | 0.2  | 0.2  |
|                     | FRPU7  | <i>Frangula purshiana</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|                     | GAEL   | <i>Garrya elliptica</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|                     | LONIC  | <i>Lonicera</i>                                     | 25  | 0.2  | 0.2  | 0.2  |
|                     | LOHI2  | <i>Lonicera hispidula</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|                     | RUPA   | <i>Rubus parviflorus</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|                     | TODI   | <i>Toxicodendron diversilobum</i>                   | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 75  | 3.4  | 0.2  | 6.0  |
|                     | POMU   | <i>Polystichum munitum</i>                          | 75  | 0.2  | 0.2  | 0.2  |
|                     | HOLA   | <i>Holcus lanatus</i>                               | 50  | 1.1  | 0.2  | 2.0  |
|                     | CALAM  | <i>Calamagrostis</i>                                | 25  | 35.0 | 35.0 | 35.0 |
|                     | BRLA3  | <i>Bromus laevipes</i>                              | 25  | 1.0  | 1.0  | 1.0  |
|                     | CANU   | <i>Calamagrostis nutkaensis</i>                     | 25  | 1.0  | 1.0  | 1.0  |
|                     | WHMO   | <i>Whipplea modesta</i>                             | 25  | 1.0  | 1.0  | 1.0  |
|                     | JUPA2  | <i>Juncus patens</i>                                | 25  | 0.2  | 0.2  | 0.2  |
|                     | VICIA  | <i>Vicia</i>  | 25  | 0.2  | 0.2  | 0.2  |
|                     | 2DAPI  | <i>Danthonia pilosa</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|                     | IRMA   | <i>Iris macrosiphon</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|                     | STRIQ2 | <i>Stachys rigida</i> var. <i>quercetorum</i>       | 25  | 0.2  | 0.2  | 0.2  |
|                     | GALIU  | <i>Galium</i>                                       | 25  | 0.2  | 0.2  | 0.2  |
|                     | FRVE   | <i>Fragaria vesca</i>                               | 25  | 0.2  | 0.2  | 0.2  |
|                     | CLDO2  | <i>Clinopodium douglasii</i>                        | 25  | 0.2  | 0.2  | 0.2  |
|                     | IRDO   | <i>Iris douglasiana</i>                             | 25  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2MOSS  | Moss  | 50  | 0.2  | 0.2  | 0.2  |
|                     | 2LICHN | Lichen  | 25  | 0.2  | 0.2  | 0.2  |

***Pinus muricata* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 66.3         | 42–92         | –          |
| <b>Herb</b>             | 9.5          | 1–15          | <0.5–1     |
| <b>Shrub</b>            | 4.0          | 1–7           | <0.5–5     |



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 2.3          | 0.2–5         | <0.5–5     |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | –          |
| <b>Conifer</b>                       | 56.5         | 32–85         | 5–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (1), SW (2)

**Macrotopography:** lower 1/3 of slope (2), middle 1/3 of slope (1), middle to upper 1/3 of slope (1)

**Microtopography:** concave (1), convex (1), flat (2)

**Parent material:** Franciscan melange (1), sandstone (2), sedimentary (1)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (4)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 136 ft. | 119–162 ft. |
| <b>Slope</b>             | 10.5°   | 7–20°       |
| <b>Large rock cover</b>  | 0.1%    | 0–0.2%      |
| <b>Small rock cover</b>  | 0.5%    | 0–1%        |
| <b>Bare ground cover</b> | 4.3%    | 1–13%       |
| <b>Litter cover</b>      | 92.5%   | 85–96%      |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0008, SONO0726

**Relevés:** SONO0024, SONO0083

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Pinus muricata* Provisional Association**

n = 4

| Lifeform                               | Code  | Botanical Name                      | Con | Avg  | Min  | Max  |
|--|-------|-------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                     |     |      |      |      |
|  | PIMU  | * <i>Pinus muricata</i>             | 100 | 55.3 | 32.0 | 85.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>      | 25  | 5.0  | 5.0  | 5.0  |
|  | 2SNAG | Standing snag                       | 25  | 0.2  | 0.2  | 0.2  |
|  | ARME  | <i>Arbutus menziesii</i>            | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                     |     |      |      |      |
|  | PIMU  | * <i>Pinus muricata</i>             | 100 | 2.4  | 0.2  | 6.0  |
|  | NODE3 | <i>Notholithocarpus densiflorus</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>      | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                     |     |      |      |      |
|  | RUUR  | <i>Rubus ursinus</i>                | 75  | 1.4  | 0.2  | 2.0  |
|  | MOCA6 | <i>Morella californica</i>          | 50  | 3.0  | 1.0  | 5.0  |
|  | BAPI  | <i>Baccharis pilularis</i>          | 50  | 0.6  | 0.2  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Pinus muricata* Provisional Association**

n = 4

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                          | <b>Con</b>                                       | <b>Avg</b> | <b>Min</b> | <b>Max</b> |     |
|---------------------|-------------|--|--|------------|------------|------------|-----|
| <b>Shrub</b>        | RULE        | <i>Rubus leucodermis</i>                       | 25   | 4.0        | 4.0        | 4.0        |     |
|                     | FRCA12      | <i>Frangula californica</i>                    | 25   | 0.2        | 0.2        | 0.2        |     |
|                     | LOHI2       | <i>Lonicera hispidula</i>                      | 25   | 0.2        | 0.2        | 0.2        |     |
|                     | RUPA        | <i>Rubus parviflorus</i>                       | 25   | 0.2        | 0.2        | 0.2        |     |
|                     | RUSP        | <i>Rubus spectabilis</i>                       | 25   | 0.2        | 0.2        | 0.2        |     |
|                     | VAOV2       | <i>Vaccinium ovatum</i>                        | 25   | 0.2        | 0.2        | 0.2        |     |
|                     | <b>Herb</b> | PTAQP2   | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 75         | 0.2        | 0.2        | 0.2 |
| HOLA                |             | <i>Holcus lanatus</i>                          | 50   | 1.6        | 0.2        | 3.0        |     |
| ANOD                |             | <i>Anthoxanthum odoratum</i>                   | 50   | 0.6        | 0.2        | 1.0        |     |
| AGCA5               |             | <i>Agrostis capillaris</i>                     | 25   | 5.0        | 5.0        | 5.0        |     |
| JUPA2               |             | <i>Juncus patens</i>                           | 25   | 4.0        | 4.0        | 4.0        |     |
| CAOB3               |             | <i>Carex obnupta</i>                           | 25   | 4.0        | 4.0        | 4.0        |     |
| JULE                |             | <i>Juncus lesueurii</i>                        | 25   | 1.0        | 1.0        | 1.0        |     |
| ERGL11              |             | <i>Erechtites glomeratus</i>                   | 25   | 1.0        | 1.0        | 1.0        |     |
| ACNO7               |             | <i>Acaena novae-zelandiae</i>                  | 25   | 1.0        | 1.0        | 1.0        |     |
| ELGL                |             | <i>Elymus glaucus</i>                          | 25   | 1.0        | 1.0        | 1.0        |     |
| FRVE                |             | <i>Fragaria vesca</i>                          | 25   | 0.2        | 0.2        | 0.2        |     |
| STME2               |             | <i>Stellaria media</i>                         | 25   | 0.2        | 0.2        | 0.2        |     |
| STAJ                |             | <i>Stachys ajugoides</i>                       | 25   | 0.2        | 0.2        | 0.2        |     |
| RUAC3               |             | <i>Rumex acetosella</i>                        | 25   | 0.2        | 0.2        | 0.2        |     |
| POMU                |             | <i>Polystichum munitum</i>                     | 25   | 0.2        | 0.2        | 0.2        |     |
| PLLA                |             | <i>Plantago lanceolata</i>                     | 25   | 0.2        | 0.2        | 0.2        |     |
| OSBE                |             | <i>Osmorhiza berteroi</i>                      | 25   | 0.2        | 0.2        | 0.2        |     |
| LOPE                |             | <i>Lolium perenne</i>                          | 25   | 0.2        | 0.2        | 0.2        |     |
| WISE3               |             | <i>Viola sempervirens</i>                      | 25   | 0.2        | 0.2        | 0.2        |     |
| LETA                |             | <i>Leontodon taraxacoides</i>                  | 25   | 0.2        | 0.2        | 0.2        |     |
| GALIU               |             | <i>Galium</i>                                  | 25   | 0.2        | 0.2        | 0.2        |     |
| EQTEB               |             | <i>Equisetum telmateia</i> var. <i>braunii</i> | 25   | 0.2        | 0.2        | 0.2        |     |
| COJU2               |             | <i>Cortaderia jubata</i>                       | 25   | 0.2        | 0.2        | 0.2        |     |
| CIVU                |             | <i>Cirsium vulgare</i>                         | 25   | 0.2        | 0.2        | 0.2        |     |
| CAREX               |             | <i>Carex</i>                                   | 25   | 0.2        | 0.2        | 0.2        |     |
| BRMA                |             | <i>Briza maxima</i>                            | 25   | 0.2        | 0.2        | 0.2        |     |
| AGDE7               |             | <i>Agrostis densiflora</i>                     | 25   | 0.2        | 0.2        | 0.2        |     |
| ACMI2               |             | <i>Achillea millefolium</i>                    | 25   | 0.2        | 0.2        | 0.2        |     |
| GAAP2               |             | <i>Galium aparine</i>                          | 25   | 0.2        | 0.2        | 0.2        |     |
| IRDO                |             | <i>Iris douglasiana</i>                        | 25   | 0.2        | 0.2        | 0.2        |     |
| <b>Non-vascular</b> |             | 2LICHN   | Lichen   | 25         | 0.2        | 0.2        | 0.2 |
|                     |             | 2MOSS  | Moss   | 25         | 0.2        | 0.2        | 0.2 |

***Pinus ponderosa* – *Pseudotsuga menziesii* Alliance**  
**Ponderosa pine – Douglas fir forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Pinus ponderosa* and *Pseudotsuga menziesii* are co-dominant in the tree canopy with *Abies concolor*, *Arbutus menziesii*, *Calocedrus decurrens*, *Pinus jeffreyi*, *Pinus lambertiana*, *Quercus chrysolepis*, *Quercus garryana*, and *Quercus kelloggii*.

The ecological literature has applied the term mixed conifer forest to stands where *Pinus ponderosa* and *Pseudotsuga menziesii* share canopy dominance. Bingham (1999) developed a region-wide alliance-level classification for late seral forests based on relationships between species composition and major environmental gradients. Stands where *Pinus ponderosa* and *Pseudotsuga menziesii* shared dominance segregated significantly from other alliances. Stands are particularly extensive in the northern Coast Ranges, Klamath Mountains, and northern Sierra Nevada, where one to all the five mixed conifer trees (*Abies concolor*, *Calocedrus decurrens*, *Pinus lambertiana*, *Pinus ponderosa*, and *Pseudotsuga menziesii*) may be present, but only *Pinus ponderosa* and *Pseudotsuga menziesii* combined have high tree canopy cover. Stands of this alliance fall compositionally and environmentally between the central and southern Sierran stands of the *Pinus ponderosa* – *Calocedrus decurrens* Alliance and the coastal stands of the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance (Sawyer 2007).

Sonoma County

Sonoma County *Pinus ponderosa* – *Pseudotsuga menziesii* stands are rare and those that have been identified have a history of logging. This alliance appears to be restricted to the higher elevations of the northeastern part of the county, near The Geysers.

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**Local Alliance Summary (n = 2)**

**Elevation:** 2195–2636 ft, mean 2416 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

**Noteworthy Taxa**

*Cordylanthus tenuis* ssp. *capillaris*

CA rare plant rank: 1B.2

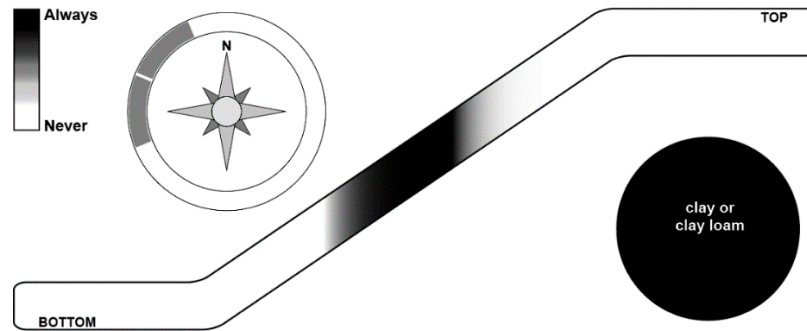
NatureServe global/state rank: G4G5T1/S1

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.5         | 53–68         | –          |
| <b>Herb</b>                          | 9.0          | 8–10          | 0.5–1      |
| <b>Shrub</b>                         | 18.0         | 14–22         | 2–5        |
| <b>Regenerating/understory tree*</b> | 5.5          | 5–6           | 2–5        |
| <b>Hardwood</b>                      | 15.5         | 5–26          | 5–10       |
| <b>Conifer</b>                       | 19.0         | 17–21         | 15–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 7.0°  | 2–12°  |
| <b>Large rock cover</b>  | 0.1%  | 0–0.2% |
| <b>Small rock cover</b>  | 15.5% | 5–26%  |
| <b>Bare ground cover</b> | 20.5% | 20–21% |
| <b>Litter cover</b>      | 61.5% | 50–73% |

**Associations within this Alliance:**

*Pinus ponderosa* – *Pseudotsuga menziesii* Association

**STAND TABLE**

***Pinus ponderosa* – *Pseudotsuga menziesii* Alliance**

n = 2

| Lifeform | Code  | Botanical Name                      | Con | Avg  | Min  | Max  |
|----------|-------|-------------------------------------|-----|------|------|------|
| Tree     | PIPO  | * <i>Pinus ponderosa</i>            | 100 | 15.5 | 11.0 | 20.0 |
|          | ARME  | * <i>Arbutus menziesii</i>          | 100 | 10.5 | 4.0  | 17.0 |
|          | PSME  | * <i>Pseudotsuga menziesii</i>      | 100 | 3.5  | 1.0  | 6.0  |
|          | QUCH2 | <i>Quercus chrysolepis</i>          | 100 | 0.6  | 0.2  | 1.0  |
|          | QUKE  | <i>Quercus kelloggii</i>            | 50  | 8.0  | 8.0  | 8.0  |
|          | NODE3 | <i>Notholithocarpus densiflorus</i> | 50  | 1.0  | 1.0  | 1.0  |
|          | ALRH2 | <i>Alnus rhombifolia</i>            | 50  | 0.2  | 0.2  | 0.2  |
|          | UMCA  | * <i>Umbellularia californica</i>   | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Pinus ponderosa* – *Pseudotsuga menziesii* Alliance**

n = 2

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | PIPO        | * <i>Pinus ponderosa</i>                                  | 100        | 3.7        | 2.2        | 5.2        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                            | 100        | 1.7        | 0.2        | 3.2        |
|  | ARME        | * <i>Arbutus menziesii</i>                                | 100        | 0.3        | 0.2        | 0.4        |
|  | UMCA        | * <i>Umbellularia californica</i>                         | 50         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i>                         | 100        | 2.0        | 2.0        | 2.0        |
|  | ARMAG       | * <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 50         | 20.0       | 20.0       | 20.0       |
|  | FRCA12      | <i>Frangula californica</i>                               | 50         | 7.0        | 7.0        | 7.0        |
|  | ARMA        | * <i>Arctostaphylos manzanita</i>                         | 50         | 4.0        | 4.0        | 4.0        |
|  | HEAR5       | <i>Heteromeles arbutifolia</i>                            | 50         | 1.0        | 1.0        | 1.0        |
|  | BAPI        | <i>Baccharis pilularis</i>                                | 50         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | BRMA3       | <i>Bromus madritensis</i>                                 | 50         | 3.0        | 3.0        | 3.0        |
|  | FEID        | <i>Festuca idahoensis</i>                                 | 50         | 2.0        | 2.0        | 2.0        |
|  | PHAQ        | <i>Phalaris aquatica</i>                                  | 50         | 2.0        | 2.0        | 2.0        |
|  | VIVI        | <i>Vicia villosa</i>                                      | 50         | 2.0        | 2.0        | 2.0        |
|  | BRLA3       | <i>Bromus laevipes</i>                                    | 50         | 1.0        | 1.0        | 1.0        |
|  | SOCA5       | <i>Solidago californica</i>                               | 50         | 1.0        | 1.0        | 1.0        |
|  | TRLA4       | <i>Trichostema lanceolatum</i>                            | 50         | 1.0        | 1.0        | 1.0        |
|  | ACMI2       | <i>Achillea millefolium</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|  | AIRA        | <i>Aira</i>   | 50         | 0.2        | 0.2        | 0.2        |
|  | CALOC       | <i>Calochortus</i>  | 50         | 0.2        | 0.2        | 0.2        |
|  | CAMU3       | <i>Calycadenia multiglandulosa</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|  | CEME2       | <i>Centaurea melitensis</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|  | COTEC       | <i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>         | 50         | 0.2        | 0.2        | 0.2        |
|  | CRSE11      | <i>Croton setigerus</i>                                   | 50         | 0.2        | 0.2        | 0.2        |
|  | CYNOS2      | <i>Cynosurus</i>  | 50         | 0.2        | 0.2        | 0.2        |
|  | CYEC        | <i>Cynosurus echinatus</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|  | DICHE2      | <i>Dichelostemma</i>                                      | 50         | 0.2        | 0.2        | 0.2        |
|  | ELGL        | <i>Elymus glaucus</i>                                     | 50         | 0.2        | 0.2        | 0.2        |
|  | GALIU       | <i>Galium</i>   | 50         | 0.2        | 0.2        | 0.2        |
|  | GRCA        | <i>Grindelia camporum</i>                                 | 50         | 0.2        | 0.2        | 0.2        |
|  | GRHI        | <i>Grindelia hirsutula</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|  | IRMA        | <i>Iris macrosiphon</i>                                   | 50         | 0.2        | 0.2        | 0.2        |
|  | MAEL        | <i>Madia elegans</i>                                      | 50         | 0.2        | 0.2        | 0.2        |
|  | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i>          | 50         | 0.2        | 0.2        | 0.2        |
|  | SACR2       | <i>Sanicula crassicaulis</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|  | SIBE        | <i>Sisyrinchium bellum</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|  | WYAN        | <i>Wyethia angustifolia</i>                               | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b>                    |             |   |            |            |            |            |
|  | 2MOSS       | Moss  | 50         | 40.0       | 40.0       | 40.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Noteworthy Taxa**

*Cordylanthus tenuis* ssp. *capillaris*

CA rare plant rank: 1B.2

NatureServe global/state rank: G4G5T1/S1

***Pinus ponderosa* – *Pseudotsuga menziesii* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.5         | 53–68         | –          |
| <b>Herb</b>                          | 9.0          | 8–10          | 0.5–1      |
| <b>Shrub</b>                         | 18.0         | 14–22         | 2–5        |
| <b>Regenerating/understory tree*</b> | 5.5          | 5–6           | 2–5        |
| <b>Hardwood</b>                      | 15.5         | 5–26          | 5–10       |
| <b>Conifer</b>                       | 19.0         | 17–21         | 15–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SW (1)

**Macrotopography:** middle 1/3 of slope (2)

**Microtopography:** convex (1), flat (1)

**Parent material:** mixed alluvium (1), volcanic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 2416 ft. | 2195–2636 ft. |
| <b>Slope</b>             | 7.0°     | 2–12°         |
| <b>Large rock cover</b>  | 0.1%     | 0–0.2%        |
| <b>Small rock cover</b>  | 15.5%    | 5–26%         |
| <b>Bare ground cover</b> | 20.5%    | 20–21%        |
| <b>Litter cover</b>      | 61.5%    | 50–73%        |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0047, SONO2028

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Pinus ponderosa* – *Pseudotsuga menziesii* Association**

n = 2

| Lifeform | Code                                   | Botanical Name  | Con                       | Avg  | Min  | Max  |
|----------|--|---|---------------------------|------|------|------|
| Tree     | PIPO                                   | * <i>Pinus ponderosa</i>                                  | 100                       | 15.5 | 11.0 | 20.0 |
|          | ARME                                   | * <i>Arbutus menziesii</i>                                | 100                       | 10.5 | 4.0  | 17.0 |
|          | PSME                                   | * <i>Pseudotsuga menziesii</i>                            | 100                       | 3.5  | 1.0  | 6.0  |
|          | QUCH2                                  | <i>Quercus chrysolepis</i>                                | 100                       | 0.6  | 0.2  | 1.0  |
|          | QUKE                                   | <i>Quercus kelloggii</i>                                  | 50                        | 8.0  | 8.0  | 8.0  |
|          | NODE3                                  | <i>Notholithocarpus densiflorus</i>                       | 50                        | 1.0  | 1.0  | 1.0  |
|          | ALRH2                                  | <i>Alnus rhombifolia</i>                                  | 50                        | 0.2  | 0.2  | 0.2  |
|          | UMCA                                   | * <i>Umbellularia californica</i>                         | 50                        | 0.2  | 0.2  | 0.2  |
|          | <b>Regenerating or Understory Tree</b> |   |                           |      |      |      |
|          | PIPO                                   | * <i>Pinus ponderosa</i>                                  | 100                       | 3.7  | 2.2  | 5.2  |
|          | PSME                                   | * <i>Pseudotsuga menziesii</i>                            | 100                       | 1.7  | 0.2  | 3.2  |
|          | ARME                                   | * <i>Arbutus menziesii</i>                                | 100                       | 0.3  | 0.2  | 0.4  |
|          | UMCA                                   | * <i>Umbellularia californica</i>                         | 50                        | 0.2  | 0.2  | 0.2  |
| Shrub    | TODI                                   | <i>Toxicodendron diversilobum</i>                         | 100                       | 2.0  | 2.0  | 2.0  |
|          | ARMAG                                  | * <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 50                        | 20.0 | 20.0 | 20.0 |
|          | FRCA12                                 | <i>Frangula californica</i>                               | 50                        | 7.0  | 7.0  | 7.0  |
|          | ARMA                                   | * <i>Arctostaphylos manzanita</i>                         | 50                        | 4.0  | 4.0  | 4.0  |
|          | HEAR5                                  | <i>Heteromeles arbutifolia</i>                            | 50                        | 1.0  | 1.0  | 1.0  |
|          | BAPI                                   | <i>Baccharis pilularis</i>                                | 50                        | 0.2  | 0.2  | 0.2  |
|          | Herb                                   | BRMA3   | <i>Bromus madritensis</i> | 50   | 3.0  | 3.0  |
| VIVI     |  | <i>Vicia villosa</i>                                      | 50                        | 2.0  | 2.0  | 2.0  |
| FEID     |  | <i>Festuca idahoensis</i>                                 | 50                        | 2.0  | 2.0  | 2.0  |
| PHAQ     |  | <i>Phalaris aquatica</i>                                  | 50                        | 2.0  | 2.0  | 2.0  |
| TRLA4    |  | <i>Trichostema lanceolatum</i>                            | 50                        | 1.0  | 1.0  | 1.0  |
| BRLA3    |  | <i>Bromus laevipes</i>                                    | 50                        | 1.0  | 1.0  | 1.0  |
| SOCA5    |  | <i>Solidago californica</i>                               | 50                        | 1.0  | 1.0  | 1.0  |
| ELGL     |  | <i>Elymus glaucus</i>                                     | 50                        | 0.2  | 0.2  | 0.2  |
| WYAN     |  | <i>Wyethia angustifolia</i>                               | 50                        | 0.2  | 0.2  | 0.2  |
| SIBE     |  | <i>Sisyrinchium bellum</i>                                | 50                        | 0.2  | 0.2  | 0.2  |
| MAEL     |  | <i>Madia elegans</i>                                      | 50                        | 0.2  | 0.2  | 0.2  |
| PTAQP2   |  | <i>Pteridium aquilinum</i> var. <i>pubescens</i>          | 50                        | 0.2  | 0.2  | 0.2  |
| IRMA     |  | <i>Iris macrosiphon</i>                                   | 50                        | 0.2  | 0.2  | 0.2  |
| GRHI     |  | <i>Grindelia hirsutula</i>                                | 50                        | 0.2  | 0.2  | 0.2  |
| GRCA     |  | <i>Grindelia camporum</i>                                 | 50                        | 0.2  | 0.2  | 0.2  |
| GALIU    |  | <i>Galium</i>   | 50                        | 0.2  | 0.2  | 0.2  |
| CYEC     |  | <i>Cynosurus echinatus</i>                                | 50                        | 0.2  | 0.2  | 0.2  |
| CYNOS2   |  | <i>Cynosurus</i>  | 50                        | 0.2  | 0.2  | 0.2  |
| CRSE11   |  | <i>Croton setigerus</i>                                   | 50                        | 0.2  | 0.2  | 0.2  |
| COTEC    |  | <i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>         | 50                        | 0.2  | 0.2  | 0.2  |
| CEME2    |  | <i>Centaurea melitensis</i>                               | 50                        | 0.2  | 0.2  | 0.2  |
| SACR2    |  | <i>Sanicula crassicaulis</i>                              | 50                        | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
 Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Pinus ponderosa* – *Pseudotsuga menziesii* Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|------------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                    |            |            |            |            |
|                     | CAMU3       | <i>Calycadenia multiglandulosa</i> | 50         | 0.2        | 0.2        | 0.2        |
|                     | CALOC       | <i>Calochortus</i>                 | 50         | 0.2        | 0.2        | 0.2        |
|                     | AIRA        | <i>Aira</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                     | ACMI2       | <i>Achillea millefolium</i>        | 50         | 0.2        | 0.2        | 0.2        |
|                     | DICHE2      | <i>Dichelostemma</i>               | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                                    |            |            |            |            |
|                     | 2MOSS       | Moss                               | 50         | 40.0       | 40.0       | 40.0       |

**Noteworthy Taxa**

*Cordylanthus tenuis* ssp. *capillaris*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4G5T1/S1



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***Pinus radiata* Alliance**  
**Monterey pine forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Pinus radiata* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Alnus rhombifolia*, *Arbutus menziesii*, *Hesperocyparis goveniana*, *Notholithocarpus densiflorus*, *Pinus attenuata*, *Pinus muricata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus wislizeni*, *Salix lasiolepis*, *Salix scouleriana*, and *Sequoia sempervirens*.

*Pinus radiata* plantations exist in the state and worldwide, but natural stands exist in only three disjunct areas in mainland California: near Año Nuevo, on the Monterey Peninsula, and at Cambria. Additional populations occur on Cedros and Guadalupe islands off central Baja California. Variations in age structure and species composition are high among the three mainland populations (Barbour 2007, Jones and Stokes Associates 1994b, 1996, Rogers 2002, Stephens et al. 2004, White 1999). Cylinder (1995) describes links between marine terrace conditions and *Pinus radiata* success. His proposed types suggest that stands dominated by *Pinus radiata* have similar species composition but differ structurally on each terrace.

It is difficult to differentiate between natural and planted tree regeneration in stands that have been reproducing along the coast of Central California. Nevertheless, the total area currently occupied by *P. radiata* is probably no more than 8000 ha (Rogers 2002). Because of this species' economic status and rarity, we know much about the species genetically (Rogers 2002).

Sonoma County

All *Pinus radiata* stands in Sonoma County are derived from plantings.

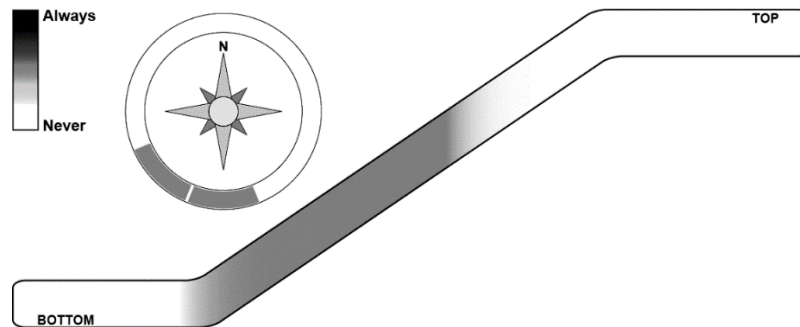
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**Local Alliance Summary (n = 2)**

**Elevation:** 61–607 ft, mean 334 ft

**SCV Global/State Rank:** G1/S1<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 60–70         | –          |
| <b>Herb</b>                          | 12.0         | 1–23          | <0.5–1     |
| <b>Shrub</b>                         | 14.1         | 0.2–28        | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 1.5          | 1–2           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 45.5         | 40–51         | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 4.0°  | 3–5°   |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.5%  | 0–1%   |
| <b>Bare ground cover</b> | 0.5%  | 0–1%   |
| <b>Litter cover</b>      | 96.5% | 95–98% |

**Associations within this Alliance:**

*Pinus radiata* Provisional Semi-Natural Association

**STAND TABLE**

***Pinus radiata* Alliance**

n = 2

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | PIRA2  | * <i>Pinus radiata</i>                           | 100 | 45.5 | 40.0 | 51.0 |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>              | 100 | 1.1  | 0.2  | 2.0  |
|  | PIRA2  | * <i>Pinus radiata</i>                           | 100 | 0.7  | 0.2  | 1.2  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                     | 50  | 4.2  | 4.2  | 4.2  |
|  | ABGR   | <i>Abies grandis</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|  | QUAG   | <i>Quercus agrifolia</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|  | UMCA   | <i>Umbellularia californica</i>                  | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 50  | 12.0 | 12.0 | 12.0 |
|  | RUUR   | <i>Rubus ursinus</i>                             | 50  | 10.0 | 10.0 | 10.0 |
|  | FRCA12 | <i>Frangula californica</i>                      | 50  | 6.0  | 6.0  | 6.0  |
|  | ILAQ80 | <i>Ilex aquifolium</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|  | RUAR9  | <i>Rubus armeniacus</i>                          | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | HOLA   | <i>Holcus lanatus</i>                            | 100 | 10.1 | 0.2  | 20.0 |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 0.6  | 0.2  | 1.0  |
|  | BRMA   | <i>Briza maxima</i>                              | 50  | 3.0  | 3.0  | 3.0  |
|  | ERGL11 | <i>Erechtites glomeratus</i>                     | 50  | 1.0  | 1.0  | 1.0  |
|  | ELCA10 | <i>Elymus californicus</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|  | PLLA   | <i>Plantago lanceolata</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|  | POMU   | <i>Polystichum munitum</i>                       | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Pinus radiata* Alliance**

n = 2

| Lifeform     | Code  | Botanical Name        | Con | Avg | Min | Max |
|--------------|-------|-----------------------|-----|-----|-----|-----|
| Herb         |       |                       |     |     |     |     |
|              | RUMEX | <i>Rumex</i>          | 50  | 0.2 | 0.2 | 0.2 |
|              | STRI  | <i>Stachys rigida</i> | 50  | 0.2 | 0.2 | 0.2 |
| Non-vascular |       |                       |     |     |     |     |
|              | 2MOSS | Moss                  | 50  | 0.2 | 0.2 | 0.2 |

***Pinus radiata* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 65.0         | 60–70         | –          |
| Herb                          | 12.0         | 1–23          | <0.5–1     |
| Shrub                         | 14.1         | 0.2–28        | 0.5–5      |
| Regenerating/understory tree* | 1.5          | 1–2           | 2–5        |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 45.5         | 40–51         | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1)

**Microtopography:** convex (1), flat (1)

**Parent material:** Franciscan melange (1), sedimentary (1)

**Soil texture:** no data (2)

**Slope steepness:** gentle/1-5° (2)

|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 334 ft. | 61–607 ft. |
| Slope             | 4.0°    | 3–5°       |
| Large rock cover  | 0.0%    | 0–0%       |
| Small rock cover  | 0.5%    | 0–1%       |
| Bare ground cover | 0.5%    | 0–1%       |
| Litter cover      | 96.5%   | 95–98%     |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0626, SONO0713

**Relevés:** none

**SCV Global/State Rank:** Not ranked – semi-natural association.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Pinus radiata* Provisional Semi-Natural Association**

n = 2

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            |             |  |            |            |            |            |
|  | PIRA2       | * <i>Pinus radiata</i>                           | 100        | 45.5       | 40.0       | 51.0       |
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | NODE3       | <i>Notholithocarpus densiflorus</i>              | 100        | 1.1        | 0.2        | 2.0        |
|  | PIRA2       | * <i>Pinus radiata</i>                           | 100        | 0.7        | 0.2        | 1.2        |
|  | PSME        | <i>Pseudotsuga menziesii</i>                     | 50         | 4.2        | 4.2        | 4.2        |
|  | QUAG        | <i>Quercus agrifolia</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | UMCA        | <i>Umbellularia californica</i>                  | 50         | 0.2        | 0.2        | 0.2        |
|  | ABGR        | <i>Abies grandis</i>                             | 50         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | LOHI2       | <i>Lonicera hispidula</i>                        | 50         | 12.0       | 12.0       | 12.0       |
|  | RUUR        | <i>Rubus ursinus</i>                             | 50         | 10.0       | 10.0       | 10.0       |
|  | FRCA12      | <i>Frangula californica</i>                      | 50         | 6.0        | 6.0        | 6.0        |
|  | ILAQ80      | <i>Ilex aquifolium</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|  | RUAR9       | <i>Rubus armeniacus</i>                          | 50         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | HOLA        | <i>Holcus lanatus</i>                            | 100        | 10.1       | 0.2        | 20.0       |
|  | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100        | 0.6        | 0.2        | 1.0        |
|  | BRMA        | <i>Briza maxima</i>                              | 50         | 3.0        | 3.0        | 3.0        |
|  | ERGL11      | <i>Erechtites glomeratus</i>                     | 50         | 1.0        | 1.0        | 1.0        |
|  | PLLA        | <i>Plantago lanceolata</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|  | STRI        | <i>Stachys rigida</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|  | ELCA10      | <i>Elymus californicus</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|  | RUMEX       | <i>Rumex</i>                                     | 50         | 0.2        | 0.2        | 0.2        |
|  | POMU        | <i>Polystichum munitum</i>                       | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b>                    |             |  |            |            |            |            |
|  | 2MOSS       | Moss   | 50         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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## ***Pinus sabiniana* Alliance**

### **Foothill pine woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Pinus sabiniana* is dominant or co-dominant in the tree canopy with *Aesculus californica*, *Juniperus californica*, *Juniperus occidentalis*, *Pinus coulteri*, *Quercus chrysolepis*, and *Quercus wislizeni*.

This extensive alliance occupies rough foothill slopes, intermixed with stands of chaparral (Allen-Diaz et al. 2007, Sawyer 2007). The northernmost California stand of this widespread species on serpentine is along the Salmon River in the Klamath Mountains (Griffin and Critchfield 1972); the range of the species extends into southern Oregon. *Pinus sabiniana* is a common and important member of stands of the *Quercus douglasii* Alliance. In the *Pinus sabiniana* Alliance, *Quercus douglasii* may be present only at low cover; mixed stands are placed in the *Q. douglasii* Alliance. *Pinus sabiniana* also occurs as an emergent over chaparral in many shrubland alliances.

### Sonoma County

*Pinus sabiniana* stands in Sonoma County are associated with serpentine and occur primarily over low, shrubby understories.

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### **Local Alliance Summary (n = 9)**

**Elevation:** 521–2966 ft, mean 1289 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

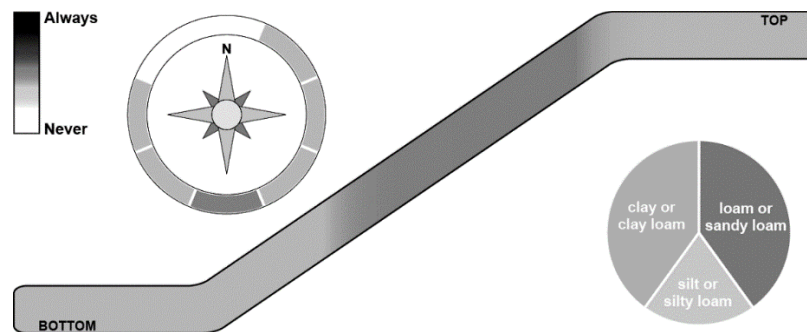
#### **Noteworthy Taxa**

*Calystegia collina* ssp. *oxyphylla*

CA rare plant rank: 4.2

NatureServe global/state rank: G4T3/S3

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 47.4         | 18–73         | –          |
| <b>Herb</b>                          | 17.4         | 2–55          | <0.5–1     |
| <b>Shrub</b>                         | 21.4         | 1–45          | 1–5        |
| <b>Regenerating/understory tree*</b> | 3.3          | 0.2–8         | <0.5–10    |
| <b>Hardwood</b>                      | 1.6          | 0–3           | 1–20       |
| <b>Conifer</b>                       | 11.6         | 10–16         | 5–35       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.7° | 3–40°  |
| <b>Large rock cover</b>  | 13.3% | 0–51%  |
| <b>Small rock cover</b>  | 15.9% | 0–28%  |
| <b>Bare ground cover</b> | 15.3% | 2–25%  |
| <b>Litter cover</b>      | 53.4% | 20–94% |

**Associations within this Alliance:**

*Pinus sabiniana* / *Quercus durata* Provisional Association

*Pinus sabiniana* / *Arctostaphylos viscida* Association

**STAND TABLE**

***Pinus sabiniana* Alliance**

n = 9

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PISA2  | * <i>Pinus sabiniana</i>                            | 100 | 13.9 | 10.0 | 25.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 44  | 2.6  | 0.2  | 6.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 22  | 2.0  | 1.0  | 3.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PISA2  | * <i>Pinus sabiniana</i>                            | 67  | 1.1  | 0.2  | 2.2  |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 33  | 1.9  | 0.2  | 5.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 33  | 1.2  | 0.2  | 3.0  |
|  | ARME   | <i>Arbutus menziesii</i>                            | 22  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 100 | 5.4  | 1.0  | 10.0 |
|  | QUDU4  | <i>Quercus durata</i>                               | 78  | 9.3  | 0.2  | 25.0 |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 67  | 3.9  | 0.2  | 10.0 |
|  | CEJE   | <i>Ceanothus jepsonii</i>                           | 56  | 2.3  | 0.2  | 6.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 56  | 1.4  | 0.2  | 3.0  |
|  | FRCA12 | <i>Frangula californica</i>                         | 44  | 2.1  | 0.2  | 5.0  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 33  | 2.4  | 0.2  | 6.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                     | 33  | 2.4  | 0.2  | 5.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 22  | 1.0  | 1.0  | 1.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|  | ELGL   | <i>Elymus glaucus</i>                               | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Pinus sabiniana* Alliance**

n = 9

| Lifeform            | Code   | Botanical Name                  | Con | Avg  | Min | Max  |
|---------------------|--------|---------------------------------|-----|------|-----|------|
| <b>Herb</b>         |        |                                 |     |      |     |      |
|                     | PETR7  | <i>Pentagramma triangularis</i> | 33  | 0.2  | 0.2 | 0.2  |
|                     | BRMA   | <i>Briza maxima</i>             | 22  | 25.5 | 1.0 | 50.0 |
|                     | FECA   | <i>Festuca californica</i>      | 22  | 16.5 | 3.0 | 30.0 |
|                     | PLER3  | <i>Plantago erecta</i>          | 22  | 8.6  | 0.2 | 17.0 |
|                     | METO   | <i>Melica torreyana</i>         | 22  | 3.0  | 1.0 | 5.0  |
|                     | ELMU3  | <i>Elymus multisetus</i>        | 22  | 1.6  | 0.2 | 3.0  |
|                     | VUMI   | <i>Vulpia microstachys</i>      | 22  | 1.6  | 0.2 | 3.0  |
|                     | SIBE   | <i>Sisyrinchium bellum</i>      | 22  | 1.1  | 0.2 | 2.0  |
|                     | VUBR   | <i>Vulpia bromoides</i>         | 22  | 0.6  | 0.2 | 1.0  |
|                     | CACO35 | <i>Calystegia collina</i>       | 22  | 0.2  | 0.2 | 0.2  |
|                     | IRIS   | <i>Iris</i>                     | 22  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b> |        |                                 |     |      |     |      |
|                     | 2MOSS  | Moss                            | 44  | 0.6  | 0.2 | 1.0  |
|                     | 2LICHN | Lichen                          | 44  | 0.2  | 0.2 | 0.2  |

**Noteworthy Taxa**

*Calystegia collina* ssp. *oxyphylla*

CA rare plant rank: 4.2

NatureServe global/state rank: G4T3/S3

***Pinus sabiniana* / *Quercus durata* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (4) and Coastal Franciscan/263Ag (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 53.2         | 30–73         | –          |
| <b>Herb</b>                          | 22.4         | 2–55          | <0.5–1     |
| <b>Shrub</b>                         | 24.2         | 8–45          | 1–5        |
| <b>Regenerating/understory tree*</b> | 4.0          | 0.2–8         | <0.5–10    |
| <b>Hardwood</b>                      | 5.2          | 0–21          | 1–10       |
| <b>Conifer</b>                       | 9.6          | 1–16          | 5–35       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (1), SW (2), variable (1)

**Macrotopography:** bottom to lower 1/3 of slope (1), lower to middle 1/3 of slope (1), middle 1/3 of slope (2), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (1), convex (3), undulating (2)

**Parent material:** conglomerate (1), Franciscan melange (1), mixed metamorphic (1), serpentine (3)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (4), steep/>25° (1)

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|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1077 ft. | 521–2966 ft. |
| Slope             | 13.8°    | 3–20°        |
| Large rock cover  | 8.5%     | 0–18%        |
| Small rock cover  | 20.6%    | 10–28%       |
| Bare ground cover | 17.0%    | 5–25%        |
| Litter cover      | 52.0%    | 35–60%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SERP0010, SONO0055, SONO0088, SONO0134, SONO0402, SONO0616

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Pinus sabiniana* / *Quercus durata* Provisional Association**

n = 6

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|--------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                   |     |      |      |      |
|  | PISA2  | * <i>Pinus sabiniana</i>          | 100 | 13.0 | 10.0 | 20.0 |
|  | UMCA   | * <i>Umbellularia californica</i> | 33  | 4.0  | 2.0  | 6.0  |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |      |      |
|  | PISA2  | * <i>Pinus sabiniana</i>          | 67  | 1.2  | 0.2  | 2.2  |
|  | UMCA   | * <i>Umbellularia californica</i> | 33  | 2.7  | 0.4  | 5.0  |
|  | QUAG   | <i>Quercus agrifolia</i>          | 33  | 1.6  | 0.2  | 3.0  |
|  | ARME   | <i>Arbutus menziesii</i>          | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |                                   |     |      |      |      |
|  | QUDU4  | <i>Quercus durata</i>             | 100 | 10.8 | 1.0  | 25.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>    | 100 | 6.7  | 2.0  | 10.0 |
|  | ADFA   | <i>Adenostoma fasciculatum</i>    | 83  | 2.7  | 0.2  | 6.0  |
|  | CEJE   | <i>Ceanothus jepsonii</i>         | 83  | 2.3  | 0.2  | 6.0  |
|  | FRCA12 | <i>Frangula californica</i>       | 67  | 2.1  | 0.2  | 5.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>   | 50  | 2.4  | 0.2  | 5.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i> | 50  | 1.7  | 1.0  | 3.0  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>   | 33  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |                                   |     |      |      |      |
|  | PETR7  | <i>Pentagramma triangularis</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | FECA   | <i>Festuca californica</i>        | 33  | 16.5 | 3.0  | 30.0 |
|  | PLER3  | <i>Plantago erecta</i>            | 33  | 8.6  | 0.2  | 17.0 |
|  | SIBE   | <i>Sisyrinchium bellum</i>        | 33  | 1.1  | 0.2  | 2.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>          | 33  | 0.2  | 0.2  | 0.2  |
|  | CACO35 | <i>Calystegia collina</i>         | 33  | 0.2  | 0.2  | 0.2  |
|  | IRIS   | <i>Iris</i>                       | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

***Pinus sabiniana* / *Quercus durata* Provisional Association**

n = 6

| Lifeform            | Code   | Botanical Name | Con | Avg | Min | Max |
|---------------------|--------|----------------|-----|-----|-----|-----|
| <b>Non-vascular</b> |        |                |     |     |     |     |
|                     | 2MOSS  | Moss           | 50  | 0.7 | 0.2 | 1.0 |
|                     | 2LICHN | Lichen         | 50  | 0.2 | 0.2 | 0.2 |

**Noteworthy Taxa**

*Calystegia collina* ssp. *oxyphylla*

CA rare plant rank: 4.2

NatureServe Global/State rank: G4T3/S3

***Pinus sabiniana* / *Arctostaphylos viscida* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation and Environmental Data**

**Total vegetation cover:** 50%

**Aspect:** SE (1)

**Macrotopography:** upper 1/3 of slope (1)

**Microtopography:** convex (1)

**Parent material:** serpentine (1)

**Soil texture:** no data (1)

**Slope steepness:** steep/>25° (1)

**Elevation:** 2018 ft.

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SERP0011

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Pinus sabiniana* / *Arctostaphylos viscida* Association**

n = 1

| Lifeform     | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Tree</b>  |        |  |     |      |      |      |
|              | PISA2  | <i>Pinus sabiniana</i>                               | 100 | 25.0 | 25.0 | 25.0 |
|              | PSME   | <i>Pseudotsuga menziesii</i>                         | 100 | 3.0  | 3.0  | 3.0  |
| <b>Shrub</b> |        |  |     |      |      |      |
|              | ARVI4  | <i>Arctostaphylos viscida</i>                        | 100 | 8.0  | 8.0  | 8.0  |
|              | TODI   | <i>Toxicodendron diversilobum</i>                    | 100 | 2.0  | 2.0  | 2.0  |
|              | HEAR5  | <i>Heteromeles arbutifolia</i>                       | 100 | 2.0  | 2.0  | 2.0  |
| <b>Herb</b>  |        |  |     |      |      |      |
|              | CHLOR3 | <i>Chlorogalum</i>                                   | 100 | 3.0  | 3.0  | 3.0  |
|              | ELMU3  | <i>Elymus multisetus</i>                             | 100 | 3.0  | 3.0  | 3.0  |
|              | LOUNU  | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> | 100 | 3.0  | 3.0  | 3.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Pinus sabiniana* / *Arctostaphylos viscida* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     | VUMI        | <i>Vulpia microstachys</i>                           | 100        | 3.0        | 3.0        | 3.0        |
|                 | BRMA        | <i>Briza maxima</i>                                  | 100        | 1.0        | 1.0        | 1.0        |
|                 | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 100        | 1.0        | 1.0        | 1.0        |
|                 | LIMA2       | <i>Linanthus maculatus</i>                           | 100        | 1.0        | 1.0        | 1.0        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                             | 100        | 0.2        | 0.2        | 0.2        |

***Populus fremontii* Alliance**  
Fremont cottonwood forest

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Populus fremontii* is dominant or co-dominant in the tree canopy with *Acer negundo*, *Fraxinus latifolia*, *Juglans hindsii*, *Juglans hindsii* × *regia*, *Platanus racemosa*, *Quercus agrifolia*, *Salix exigua*, *Salix gooddingii*, *Salix laevigata*, *Salix lasiolepis*, *Salix lucida* ssp. *lasiandra*, and *Salix lutea*.

The *Populus fremontii* Alliance is found in riparian settings and may dominate stands or mix with other trees. Some uncertainty exists about the proper classification of mixed stands of *Populus fremontii* and *Salix gooddingii*. Vaghti (2003) places these in the *P. fremontii* Alliance; Hickson and Keeler-Wolf (2007), in a larger survey from the Sacramento Delta, suggest that they are better placed in the *Salix gooddingii* Alliance. Furthermore, uncertainty exists about mixed stands of *Populus fremontii* and *Platanus racemosa*. Klein and Evens (2005) and Evens and San (2005) place co-dominant stands in a mixed alliance, but Sawyer et al. (2009) place them in the *Platanus racemosa* Alliance. In southern California, *Populus fremontii* occurs in mixed stands with *Salix laevigata* and other willows (*S. lucida* and *S. lasiolepis*), *Quercus agrifolia*, and *Juglans californica* (Klein and Evens 2005, Stillwater Sciences and URS 2007).

Sonoma County

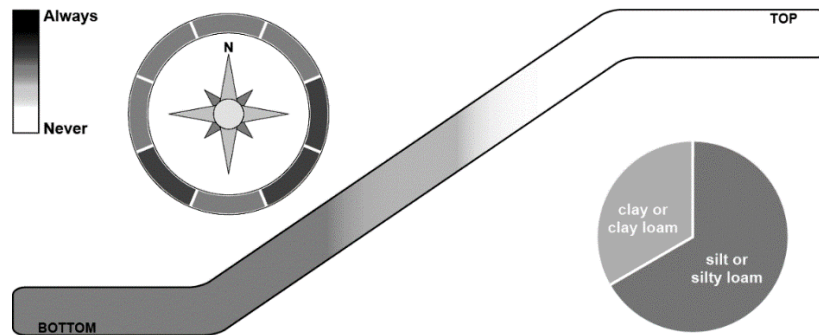
Sonoma County *Populus fremontii* stands are similar to many northern California stands that are found along rivers and larger creeks in the foothills and Great Valley.

**Local Alliance Summary (n = 7)**

**Elevation:** 43–305 ft, mean 158 ft

**Conservation Rank Status:** G4/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 75.4         | 42–98         | –          |
| Herb             | 15.9         | 0–33          | <0.5–5     |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Shrub                         | 33.6         | 3–70          | <0.5–10    |
| Regenerating/understory tree* | 9.3          | 2–35          | 2–15       |
| Hardwood                      | 33.7         | 11–63         | 10–35      |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 7.7°  | 0–33°  |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 12.2% | 0–61%  |
| Bare ground cover | 14.2% | 2–30%  |
| Litter cover      | 71.6% | 15–97% |

**Associations within this Alliance:**

*Populus fremontii* – *Acer negundo* Association

*Populus fremontii* / *Salix exigua* Association

**STAND TABLE**

***Populus fremontii* Alliance**

n = 7

| Lifeform                               | Code   | Botanical Name                            | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Tree</b>                            |        |   |     |      |     |      |
|  | POFR2  | * <i>Populus fremontii</i>                | 100 | 16.3 | 6.0 | 30.0 |
|  | SALA3  | * <i>Salix laevigata</i>                  | 86  | 8.4  | 0.2 | 30.0 |
|  | ACNE2  | * <i>Acer negundo</i>                     | 86  | 5.0  | 0.2 | 10.0 |
|  | JUHI   | * <i>Juglans hindsii</i>                  | 57  | 14.5 | 4.0 | 25.0 |
|  | QUAG   | <i>Quercus agrifolia</i>                  | 29  | 2.0  | 2.0 | 2.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | SALA3  | * <i>Salix laevigata</i>                  | 57  | 8.6  | 1.0 | 25.2 |
|  | ACNE2  | * <i>Acer negundo</i>                     | 57  | 4.1  | 1.0 | 10.2 |
|  | JUHI   | * <i>Juglans hindsii</i>                  | 57  | 3.1  | 0.2 | 7.0  |
|  | POFR2  | * <i>Populus fremontii</i>                | 29  | 1.3  | 0.4 | 2.2  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>         | 71  | 7.6  | 0.2 | 25.0 |
|  | RUUR   | <i>Rubus ursinus</i>                      | 43  | 37.3 | 2.0 | 60.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                | 43  | 0.7  | 0.2 | 1.0  |
|  | SAEX   | <i>Salix exigua</i>                       | 29  | 8.5  | 2.0 | 15.0 |
|  | VICA5  | <i>Vitis californica</i>                  | 29  | 2.6  | 0.2 | 5.0  |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 29  | 0.6  | 0.2 | 1.0  |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | ARDO4  | <i>Arundo donax</i>                       | 86  | 4.2  | 0.2 | 15.0 |
|  | ARDO3  | <i>Artemisia douglasiana</i>              | 71  | 6.4  | 1.0 | 15.0 |
|  | VIMA   | <i>Vinca major</i>                        | 57  | 12.9 | 0.2 | 50.0 |
|  | BRDI3  | <i>Bromus diandrus</i>                    | 43  | 7.1  | 0.2 | 18.0 |
|  | GAAP2  | <i>Galium aparine</i>                     | 43  | 0.5  | 0.2 | 1.0  |
|  | LETR5  | <i>Leymus triticoides</i>                 | 29  | 5.5  | 1.0 | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Populus fremontii* Alliance**

n = 7

| Lifeform            | Code   | Botanical Name                 | Con | Avg | Min | Max |
|---------------------|--------|--------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |        |                                |     |     |     |     |
|                     | CYDA   | <i>Cynodon dactylon</i>        | 29  | 2.5 | 2.0 | 3.0 |
|                     | BASA4  | <i>Baccharis salicifolia</i>   | 29  | 1.1 | 0.2 | 2.0 |
|                     | AGOR   | <i>Agrostis oregonensis</i>    | 29  | 0.6 | 0.2 | 1.0 |
|                     | BRNI   | <i>Brassica nigra</i>          | 29  | 0.6 | 0.2 | 1.0 |
|                     | URDI   | <i>Urtica dioica</i>           | 29  | 0.6 | 0.2 | 1.0 |
|                     | AGROS2 | <i>Agrostis</i>                | 29  | 0.2 | 0.2 | 0.2 |
|                     | MEPU   | <i>Mentha pulegium</i>         | 29  | 0.2 | 0.2 | 0.2 |
|                     | POMO5  | <i>Polypogon monspeliensis</i> | 29  | 0.2 | 0.2 | 0.2 |
|                     | XAST   | <i>Xanthium strumarium</i>     | 29  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                                |     |     |     |     |
|                     | 2MOSS  | Moss                           | 43  | 0.5 | 0.2 | 1.0 |

***Populus fremontii* – *Acer negundo* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (3) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 81.0         | 45–98         | –          |
| <b>Herb</b>                          | 16.7         | 0–33          | <0.5–5     |
| <b>Shrub</b>                         | 35.3         | 3–70          | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 10.0         | 2–35          | 2–15       |
| <b>Hardwood</b>                      | 37.5         | 20–63         | 10–35      |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (3), NE (1), SW (1), variable (1)

**Macrotopography:** bottom (3), lower 1/3 of slope (2), lower to middle 1/3 of slope (1)

**Microtopography:** concave (1), flat (2), undulating (3)

**Parent material:** Franciscan melange (1), mixed alluvium (1), silty alluvium (4)

**Soil texture:** clay or clay loam (1), silt or silt loam (2)

**Slope steepness:** flat/0° (3), gentle/1-5° (1), moderate/6-25° (1), steep/>25° (1)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 152 ft. | 43–305 ft. |
| <b>Slope</b>             | 8.8°    | 0–33°      |
| <b>Large rock cover</b>  | 0.0%    | 0–0%       |
| <b>Small rock cover</b>  | 0.1%    | 0–0.2%     |
| <b>Bare ground cover</b> | 12.3%   | 2–30%      |
| <b>Litter cover</b>      | 85.8%   | 68–97%     |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0169, SONO0333, SONO0599, SONO0784, SONO0812, SONO0813

**Relevés:** none

SCV Global/State Rank: G3?/S3?<sup>1</sup>

**STAND TABLE**

***Populus fremontii* – *Acer negundo* Association**

n = 6

| Lifeform                               | Code   | Botanical Name                            | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Tree</b>                            |        |   |     |      |     |      |
|  | POFR2  | <i>Populus fremontii</i>                  | 100 | 17.3 | 6.0 | 30.0 |
|  | ACNE2  | * <i>Acer negundo</i>                     | 100 | 5.0  | 0.2 | 10.0 |
|  | SALA3  | * <i>Salix laevigata</i>                  | 83  | 9.9  | 0.2 | 30.0 |
|  | JUHI   | * <i>Juglans hindsii</i>                  | 67  | 14.5 | 4.0 | 25.0 |
|  | QUAG   | <i>Quercus agrifolia</i>                  | 33  | 2.0  | 2.0 | 2.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | ACNE2  | * <i>Acer negundo</i>                     | 67  | 4.1  | 1.0 | 10.2 |
|  | JUHI   | * <i>Juglans hindsii</i>                  | 67  | 3.1  | 0.2 | 7.0  |
|  | SALA3  | * <i>Salix laevigata</i>                  | 50  | 10.4 | 1.0 | 25.2 |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>         | 83  | 7.6  | 0.2 | 25.0 |
|  | RUUR   | <i>Rubus ursinus</i>                      | 50  | 37.3 | 2.0 | 60.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                | 50  | 0.7  | 0.2 | 1.0  |
|  | VICA5  | <i>Vitis californica</i>                  | 33  | 2.6  | 0.2 | 5.0  |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 33  | 0.6  | 0.2 | 1.0  |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | ARDO4  | <i>Arundo donax</i>                       | 83  | 4.8  | 0.2 | 15.0 |
|  | VIMA   | <i>Vinca major</i>                        | 67  | 12.9 | 0.2 | 50.0 |
|  | ARDO3  | <i>Artemisia douglasiana</i>              | 67  | 7.8  | 3.0 | 15.0 |
|  | GAAP2  | <i>Galium aparine</i>                     | 50  | 0.5  | 0.2 | 1.0  |
|  | BRDI3  | <i>Bromus diandrus</i>                    | 33  | 9.1  | 0.2 | 18.0 |
|  | LETR5  | <i>Leymus triticoides</i>                 | 33  | 5.5  | 1.0 | 10.0 |
|  | CYDA   | <i>Cynodon dactylon</i>                   | 33  | 2.5  | 2.0 | 3.0  |
|  | AGOR   | <i>Agrostis oregonensis</i>               | 33  | 0.6  | 0.2 | 1.0  |
|  | URDI   | <i>Urtica dioica</i>                      | 33  | 0.6  | 0.2 | 1.0  |
|  | MEPU   | <i>Mentha pulegium</i>                    | 33  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |     |      |
|  | 2MOSS  | Moss                                      | 50  | 0.5  | 0.2 | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Populus fremontii* / *Salix exigua* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 42.0         | 42            | –          |
| Herb             | 11.0         | 11            | 0.5–1      |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Shrub</b>                         | 23.0         | 23            | 2–5        |
| <b>Regenerating/understory tree*</b> | 5.0          | 5             | 5–10       |
| <b>Hardwood</b>                      | 11.0         | 11            | 10–15      |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1)

**Macrotopography:** bottom (1)

**Microtopography:** undulating (1)

**Parent material:** mixed alluvium (1)

**Soil texture:** no data (1)

**Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 193 ft. | 193 ft. |
| <b>Slope</b>             | 1.0°    | 1°      |
| <b>Large rock cover</b>  | 0.2%    | 0.2%    |
| <b>Small rock cover</b>  | 61.0%   | 61%     |
| <b>Bare ground cover</b> | 22.0%   | 22%     |
| <b>Litter cover</b>      | 15.0%   | 15%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0781

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Populus fremontii* / *Salix exigua* Association**

n = 1

| Lifeform     | Code                                   | Botanical Name                   | Con | Avg  | Min  | Max  |
|--------------|--|----------------------------------|-----|------|------|------|
| <b>Tree</b>  | POFR2                                  | * <i>Populus fremontii</i>       | 100 | 10.0 | 10.0 | 10.0 |
|              | SALA3                                  | * <i>Salix laevigata</i>         | 100 | 1.0  | 1.0  | 1.0  |
|              | <b>Regenerating or Understory Tree</b> |                                  |     |      |      |      |
|              | SALA3                                  | * <i>Salix laevigata</i>         | 100 | 3.0  | 3.0  | 3.0  |
|              | POFR2                                  | * <i>Populus fremontii</i>       | 100 | 2.2  | 2.2  | 2.2  |
| <b>Shrub</b> | SAEX                                   | <i>Salix exigua</i>              | 100 | 15.0 | 15.0 | 15.0 |
|              | SAME2                                  | <i>Salix melanopsis</i>          | 100 | 8.0  | 8.0  | 8.0  |
|              | PHMA18                                 | <i>Phoradendron macrophyllum</i> | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  | BRDI3                                  | <i>Bromus diandrus</i>           | 100 | 3.0  | 3.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

*Populus fremontii* / *Salix exigua* Association

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                |            |            |            |            |
|                 | BASA4       | <i>Baccharis salicifolia</i>   | 100        | 2.0        | 2.0        | 2.0        |
|                 | HEOR2       | <i>Heterotheca oregona</i>     | 100        | 2.0        | 2.0        | 2.0        |
|                 | ARDO3       | <i>Artemisia douglasiana</i>   | 100        | 1.0        | 1.0        | 1.0        |
|                 | ARDO4       | <i>Arundo donax</i>            | 100        | 1.0        | 1.0        | 1.0        |
|                 | BRNI        | <i>Brassica nigra</i>          | 100        | 1.0        | 1.0        | 1.0        |
|                 | MEOF        | <i>Melilotus officinalis</i>   | 100        | 1.0        | 1.0        | 1.0        |
|                 | EPILO       | <i>Epilobium</i>               | 100        | 0.2        | 0.2        | 0.2        |
|                 | XAST        | <i>Xanthium strumarium</i>     | 100        | 0.2        | 0.2        | 0.2        |
|                 | LOPE        | <i>Lolium perenne</i>          | 100        | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>           | 100        | 0.2        | 0.2        | 0.2        |
|                 | AGROS2      | <i>Agrostis</i>                | 100        | 0.2        | 0.2        | 0.2        |
|                 | AETR        | <i>Aegilops triuncialis</i>    | 100        | 0.2        | 0.2        | 0.2        |
|                 | POMO5       | <i>Polypogon monspeliensis</i> | 100        | 0.2        | 0.2        | 0.2        |
|                 | BRMA3       | <i>Bromus madritensis</i>      | 100        | 0.2        | 0.2        | 0.2        |



***Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance**  
 Douglas fir – tanoak forest

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Notholithocarpus densiflorus* and *Pseudotsuga menziesii* are co-dominant in the tree canopy with *Acer macrophyllum*, *Arbutus menziesii*, *Calocedrus decurrens*, *Chamaecyparis lawsoniana*, *Chrysolepis chrysophylla*, *Pinus lambertiana*, *Pinus ponderosa*, *Quercus chrysolepis*, *Quercus kelloggii*, *Taxus brevifolia*, and *Umbellularia californica*.

Ecologists have used the term “mixed evergreen forest” in referring to stands in this and several other alliances (Sawyer 2007). However, Bingham (1999) found that stands where *Pseudotsuga menziesii* and *Notholithocarpus densiflorus* shared dominance segregated significantly in species composition and environmental conditions from those where *Pseudotsuga menziesii* shared dominance with other trees (see the *Abies concolor* – *Pseudotsuga menziesii*, *Pinus ponderosa* – *Pseudotsuga menziesii*, and *Pseudotsuga menziesii* Alliances).

Sonoma County

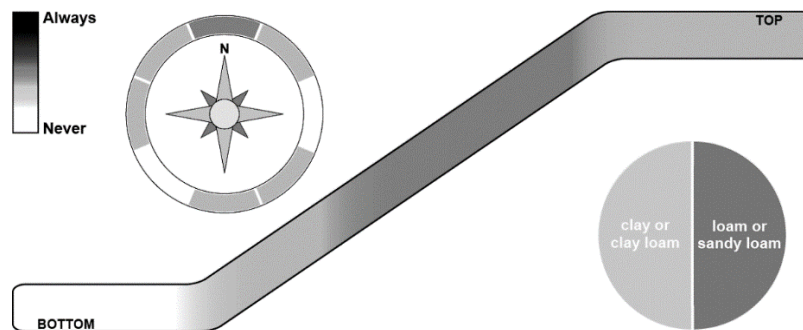
In Sonoma County, *Notholithocarpus densiflorus* has been decimated by sudden oak death. Due to this disease, *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* stands are rapidly being converted to the *Pseudotsuga menziesii* Alliance.

**Local Alliance Summary (n = 13)**

**Elevation:** 447–2096 ft, mean 1005 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 68.1         | 50–80         | –          |
| <b>Herb</b>             | 6.8          | 0–31          | <0.5–2     |
| <b>Shrub</b>            | 4.4          | 0–21          | <0.5–5     |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 12.6         | 1–34          | 2–15       |
| Hardwood                      | 34.9         | 3–57          | 5–20       |
| Conifer                       | 21.2         | 8–38          | 5–50       |

\*Includes seedlings and saplings

Summary of Environmental Data

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 26.2° | 19–35° |
| Large rock cover  | 0.3%  | 0–3%   |
| Small rock cover  | 5.0%  | 0–28%  |
| Bare ground cover | 15.2% | 3–50%  |
| Litter cover      | 77.2% | 40–93% |

Associations within this Alliance:

*Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Association

**STAND TABLE**

*Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance

n = 13

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min | Max  |
|--|-------|---------------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                       |     |      |     |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 29.0 | 3.0 | 53.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 100 | 20.0 | 4.0 | 38.0 |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 46  | 2.5  | 0.2 | 4.0  |
|  | ARME  | * <i>Arbutus menziesii</i>            | 38  | 7.6  | 1.0 | 23.0 |
|  | UMCA  | * <i>Umbellularia californica</i>     | 31  | 9.8  | 2.0 | 19.0 |
|  | 2SNAG | Standing snag                         | 31  | 0.4  | 0.2 | 1.0  |
|  | PILA  | * <i>Pinus lambertiana</i>            | 23  | 3.1  | 0.2 | 6.0  |
|  | QUAG  | <i>Quercus agrifolia</i>              | 23  | 0.8  | 0.2 | 2.0  |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |     |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 5.2  | 1.2 | 18.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 85  | 7.0  | 0.2 | 29.0 |
|  | ARME  | * <i>Arbutus menziesii</i>            | 62  | 1.5  | 0.2 | 5.0  |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 54  | 0.5  | 0.2 | 2.2  |
|  | UMCA  | * <i>Umbellularia californica</i>     | 54  | 0.5  | 0.2 | 2.2  |
|  | PILA  | * <i>Pinus lambertiana</i>            | 23  | 0.2  | 0.1 | 0.4  |
| <b>Shrub</b>                           |       |                                       |     |      |     |      |
|  | LOHI2 | <i>Lonicera hispidula</i>             | 69  | 0.2  | 0.2 | 0.2  |
|  | VAOV2 | <i>Vaccinium ovatum</i>               | 38  | 1.1  | 0.2 | 3.0  |
|  | BAPI  | <i>Baccharis pilularis</i>            | 38  | 1.0  | 0.2 | 4.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>     | 38  | 0.7  | 0.2 | 2.0  |
|  | RUUR  | <i>Rubus ursinus</i>                  | 23  | 4.7  | 1.0 | 10.0 |
| <b>Herb</b>                            |       |                                       |     |      |     |      |
|  | POMU  | <i>Polystichum munitum</i>            | 62  | 5.4  | 0.2 | 30.0 |
|  | IRIS  | <i>Iris</i>                           | 54  | 0.2  | 0.2 | 0.2  |
|  | WHMO  | <i>Whipplea modesta</i>               | 38  | 1.5  | 0.2 | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance**

n = 13

| Lifeform            | Code   | Botanical Name                                   | Con | Avg | Min | Max  |
|---------------------|--------|--|-----|-----|-----|------|
| <b>Herb</b>         |        |  |     |     |     |      |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 38  | 0.8 | 0.2 | 3.0  |
|                     | CAREX  | <i>Carex</i>                                     | 38  | 0.2 | 0.2 | 0.2  |
|                     | CYEC   | <i>Cynosurus echinatus</i>                       | 23  | 0.5 | 0.2 | 1.0  |
|                     | PETR7  | <i>Pentagramma triangularis</i>                  | 23  | 0.2 | 0.2 | 0.2  |
| <b>Non-vascular</b> |        |  |     |     |     |      |
|                     | 2MOSS  | Moss   | 92  | 4.5 | 0.2 | 17.0 |
|                     | 2LICHN | Lichen   | 23  | 0.2 | 0.2 | 0.2  |

***Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (12) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 68.1         | 50–80         | –          |
| <b>Herb</b>                          | 6.8          | 0–31          | <0.5–2     |
| <b>Shrub</b>                         | 4.4          | 0–21          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 12.6         | 1–34          | 2–15       |
| <b>Hardwood</b>                      | 34.9         | 3–57          | 5–20       |
| <b>Conifer</b>                       | 21.2         | 8–38          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), NW (5), SE (4), SW (1)

**Macrotopography:** lower 1/3 of slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (5), middle to upper 1/3 of slope (1), upper 1/3 of slope (3), upper 1/3 of slope to ridgetop (2)

**Microtopography:** concave (1), convex (2), flat (5), undulating (5)

**Parent material:** Franciscan melange (4), sandstone (9)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (6), steep/>25° (6)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1005 ft. | 447–2096 ft. |
| <b>Slope</b>             | 26.2°    | 19–35°       |
| <b>Large rock cover</b>  | 0.3%     | 0–3%         |
| <b>Small rock cover</b>  | 5.0%     | 0–28%        |
| <b>Bare ground cover</b> | 15.2%    | 3–50%        |
| <b>Litter cover</b>      | 77.2%    | 40–93%       |

**Samples Used to Describe Association (n=13)**

**Rapid Assessments:** SONO0144, SONO0869, SONO0875, SONO0877, SONO0904, SONO0905, SONO0906, SONO0909, SONO0950, SONO0966, SONO0986

**Relevés:** SONO0001, SONO0121

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SCV Global/State Rank: G4/S3?<sup>1</sup>

**STAND TABLE**

***Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Association**

n = 13

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min | Max  |
|--|--------|--|-----|------|-----|------|
| <b>Tree</b>                            |        |  |     |      |     |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 100 | 29.0 | 3.0 | 53.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 100 | 20.0 | 4.0 | 38.0 |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 46  | 2.5  | 0.2 | 4.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 38  | 7.6  | 1.0 | 23.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 31  | 9.8  | 2.0 | 19.0 |
|  | 2SNAG  | Standing snag                                    | 31  | 0.4  | 0.2 | 1.0  |
|  | PILA   | * <i>Pinus lambertiana</i>                       | 23  | 3.1  | 0.2 | 6.0  |
|  | QUAG   | <i>Quercus agrifolia</i>                         | 23  | 0.8  | 0.2 | 2.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |     |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 100 | 5.2  | 1.2 | 18.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 85  | 7.0  | 0.2 | 29.0 |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 62  | 1.5  | 0.2 | 5.0  |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 54  | 0.5  | 0.2 | 2.2  |
|  | UMCA   | * <i>Umbellularia californica</i>                | 54  | 0.5  | 0.2 | 2.2  |
|  | PILA   | * <i>Pinus lambertiana</i>                       | 23  | 0.2  | 0.1 | 0.4  |
| <b>Shrub</b>                           |        |  |     |      |     |      |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 69  | 0.2  | 0.2 | 0.2  |
|  | VAOV2  | <i>Vaccinium ovatum</i>                          | 38  | 1.1  | 0.2 | 3.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                       | 38  | 1.0  | 0.2 | 4.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 38  | 0.7  | 0.2 | 2.0  |
|  | RUUR   | <i>Rubus ursinus</i>                             | 23  | 4.7  | 1.0 | 10.0 |
| <b>Herb</b>                            |        |  |     |      |     |      |
|  | POMU   | <i>Polystichum munitum</i>                       | 62  | 5.4  | 0.2 | 30.0 |
|  | IRIS   | <i>Iris</i>                                      | 54  | 0.2  | 0.2 | 0.2  |
|  | WHMO   | <i>Whipplea modesta</i>                          | 38  | 1.5  | 0.2 | 3.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 38  | 0.8  | 0.2 | 3.0  |
|  | CAREX  | <i>Carex</i>                                     | 38  | 0.2  | 0.2 | 0.2  |
|  | CYEC   | <i>Cynosurus echinatus</i>                       | 23  | 0.5  | 0.2 | 1.0  |
|  | PETR7  | <i>Pentagramma triangularis</i>                  | 23  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |     |      |
|  | 2MOSS  | Moss   | 92  | 4.5  | 0.2 | 17.0 |
|  | 2LICHN | Lichen   | 23  | 0.2  | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Pseudotsuga menziesii* Alliance**  
**Douglas fir forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Pseudotsuga menziesii* is dominant or co-dominant in the tree canopy with *Abies concolor*, *Acer macrophyllum*, *Alnus rhombifolia*, *Arbutus menziesii*, *Calocedrus decurrens*, *Chamaecyparis lawsoniana*, *Chrysolepis chrysophylla*, *Cornus nuttallii*, *Pinus contorta*, *Pinus jeffreyi*, *Pinus lambertiana*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus garryana*, *Quercus kelloggii*, and *Sequoia sempervirens*.

The ecological literature applies the term “Douglas fir forest” to stands of varying species composition (Fites-Kaufman et al. 2007, Sawyer 2006, 2007). Bingham (1999) developed a region-wide alliance-level classification for late-seral-stage forests based on relationships between species composition and major environmental gradients. Stands dominated by *Pseudotsuga menziesii* segregated significantly from other alliances. This alliance is mainly a middle-elevation one in California. *Abies concolor* may be a component of the understory and a secondary species of tree canopy

The complex relationship between *Pseudotsuga menziesii* and other conifers and hardwoods throughout northern California has led to the recognition of four additional alliances, defined by the combinations of co-dominants: the *Abies concolor* – *Pseudotsuga menziesii* Alliance, the *Pseudotsuga menziesii* – *Calocedrus decurrens* Alliance, the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance, and the *Pinus ponderosa* – *Pseudotsuga menziesii* Alliance. Other combinations, such as in the case of the *Pseudotsuga menziesii* – *Quercus chrysolepis* Association, are included in this *Pseudotsuga menziesii* Alliance.

Sonoma County

The *Pseudotsuga menziesii* Alliance is the most extensive coniferous vegetation in Sonoma County. Prior to the extirpation of *Notholithocarpus* in much of the county, the *Pseudotsuga menziesii* Alliance generally occurred farther inland and in slightly less mesic conditions than the *P. menziesii* – *Notholithocarpus densiflorus* Alliance. Now “novel” associations of the *P. menziesii* Alliance are taking over areas which once had a major component of *Notholithocarpus densiflorus*.

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**Local Alliance Summary (n = 42)**

**Elevation:** 38–2247 ft, mean 961 ft

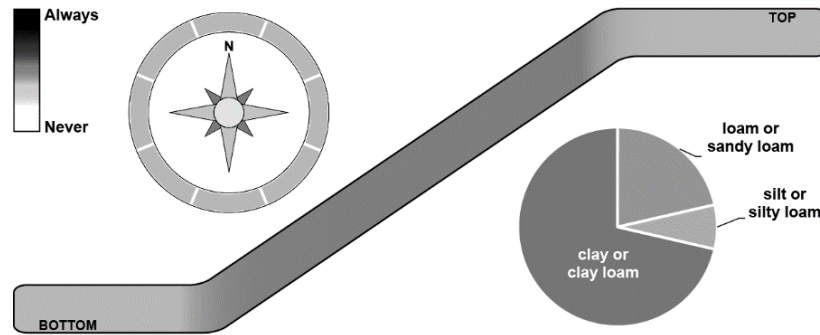
**SCV Global/State Rank:** G5/S4<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 58.4         | 33–95         | –          |
| <b>Herb</b>                          | 7.6          | 0–45          | <0.5–2     |
| <b>Shrub</b>                         | 6.3          | 0–28          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 9.4          | 0–30          | <0.5–20    |
| <b>Hardwood</b>                      | 21.9         | 0–55          | 2–50       |
| <b>Conifer</b>                       | 26.8         | 1–60          | 2–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 23.3° | 2–48° |
| <b>Large rock cover</b>  | 0.8%  | 0–9%  |
| <b>Small rock cover</b>  | 7.8%  | 0–88% |
| <b>Bare ground cover</b> | 16.3% | 0–78% |
| <b>Litter cover</b>      | 72.9% | 5–96% |

**Associations within this Alliance:**

- Pseudotsuga menziesii* – *Arbutus menziesii* Association
- Pseudotsuga menziesii* – *Quercus agrifolia* Association
- Pseudotsuga menziesii* – *Quercus chrysolepis* Association
- Pseudotsuga menziesii* – *Umbellularia californica* / *Polystichum munitum* Association
- Pseudotsuga menziesii* – *Umbellularia californica* Association

**STAND TABLE**

***Pseudotsuga menziesii* Alliance**

n = 42

| Lifeform    | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|-------------|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b> |       |                                   |     |      |     |      |
|             | PSME  | * <i>Pseudotsuga menziesii</i>    | 100 | 26.5 | 1.0 | 60.0 |
|             | UMCA  | * <i>Umbellularia californica</i> | 76  | 10.1 | 0.2 | 39.0 |
|             | ARME  | * <i>Arbutus menziesii</i>        | 60  | 7.6  | 0.2 | 35.0 |
|             | QUCH2 | * <i>Quercus chrysolepis</i>      | 36  | 10.2 | 0.2 | 33.0 |
|             | QUKE  | <i>Quercus kelloggii</i>          | 31  | 2.7  | 0.2 | 8.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Pseudotsuga menziesii* Alliance**

n = 42

| Lifeform                               | Code  | Botanical Name                                 | Con | Avg  | Min | Max  |
|--|-------|--|-----|------|-----|------|
| <b>Tree</b>                            |       |  |     |      |     |      |
|  | QUAG  | * <i>Quercus agrifolia</i>                     | 26  | 13.0 | 0.2 | 40.0 |
| <b>Regenerating or Understory Tree</b> |       |  |     |      |     |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 90  | 5.4  | 0.2 | 25.2 |
|  | UMCA  | * <i>Umbellularia californica</i>              | 67  | 5.3  | 0.2 | 30.0 |
|  | ARME  | * <i>Arbutus menziesii</i>                     | 40  | 1.7  | 0.2 | 12.0 |
|  | NODE3 | <i>Notholithocarpus densiflorus</i>            | 31  | 1.4  | 0.2 | 5.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>                     | 31  | 0.5  | 0.2 | 2.0  |
|  | QUCH2 | * <i>Quercus chrysolepis</i>                   | 26  | 2.8  | 0.2 | 10.0 |
| <b>Shrub</b>                           |       |  |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>              | 76  | 2.4  | 0.2 | 15.0 |
|  | LOHI2 | <i>Lonicera hispidula</i>                      | 50  | 1.2  | 0.2 | 5.0  |
|  | COCOC | <i>Corylus cornuta</i> var. <i>californica</i> | 33  | 1.4  | 0.2 | 12.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                 | 24  | 1.8  | 0.2 | 4.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                | 21  | 1.4  | 0.2 | 3.0  |
| <b>Herb</b>                            |       |  |     |      |     |      |
|  | CYEC  | <i>Cynosurus echinatus</i>                     | 33  | 2.0  | 0.2 | 12.0 |
|  | CAREX | <i>Carex</i>                                   | 31  | 0.5  | 0.2 | 3.0  |
|  | POMU  | <i>Polystichum munitum</i>                     | 29  | 6.1  | 0.2 | 26.0 |
|  | PETR7 | <i>Pentagramma triangularis</i>                | 26  | 0.2  | 0.2 | 0.2  |
|  | FECA  | <i>Festuca californica</i>                     | 21  | 3.7  | 0.2 | 20.0 |
|  | IRIS  | <i>Iris</i>                                    | 21  | 0.3  | 0.2 | 1.0  |
| <b>Non-vascular</b>                    |       |  |     |      |     |      |
|  | 2MOSS | Moss   | 71  | 2.8  | 0.2 | 14.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Pseudotsuga menziesii* – *Arbutus menziesii* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) and Coastal Franciscan/263Ag (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.0         | 50–65         | –          |
| <b>Herb</b>                          | 2.5          | 0–7           | <0.5–0.5   |
| <b>Shrub</b>                         | 7.4          | 0.2–17        | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 6.7          | 1–15          | 0.5–5      |
| <b>Hardwood</b>                      | 16.1         | 0–26          | 5–20       |
| <b>Conifer</b>                       | 31.0         | 25–35         | 15–50      |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** NW (1), SW (1)

**Macrotopography:** upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (1), undulating (1)

**Parent material:** Franciscan melange (1), metasedimentary (1), serpentine (1)

**Soil texture:** no data (3)

**Slope steepness:** moderate/6-25° (2)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1238 ft. | 759–2175 ft. |
| <b>Slope</b>             | 18.0°    | 15–21°       |
| <b>Large rock cover</b>  | 0.0%     | 0–0%         |
| <b>Small rock cover</b>  | 34.5%    | 0–88%        |
| <b>Bare ground cover</b> | 7.7%     | 5–10%        |
| <b>Litter cover</b>      | 56.7%    | 5–90%        |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0064, SONO0695, SONO0840

**Relevés:** none

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

**STAND TABLE**

***Pseudotsuga menziesii* – *Arbutus menziesii* Association**

n = 3

| Lifeform                               | Code  | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--|-------|--|-----|------|------|------|
| <b>Tree</b>                            |       |  |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                     | 100 | 31.7 | 25.0 | 37.0 |
|  | ARME  | * <i>Arbutus menziesii</i>                         | 67  | 22.0 | 20.0 | 24.0 |
|  | QUKE  | <i>Quercus kelloggii</i>                           | 67  | 1.5  | 1.0  | 2.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>                         | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |  |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                     | 100 | 5.9  | 0.4  | 16.0 |
|  | ARME  | * <i>Arbutus menziesii</i>                         | 67  | 2.3  | 0.4  | 4.2  |
|  | QUAG  | * <i>Quercus agrifolia</i>                         | 67  | 0.2  | 0.2  | 0.2  |
|  | 2SNAG | Standing snag                                      | 33  | 0.2  | 0.2  | 0.2  |
|  | ACMA3 | <i>Acer macrophyllum</i>                           | 33  | 0.2  | 0.2  | 0.2  |
|  | NODE3 | <i>Notholithocarpus densiflorus</i>                | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |  |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>                  | 67  | 8.5  | 2.0  | 15.0 |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                    | 67  | 0.2  | 0.2  | 0.2  |
|  | LOINL | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 33  | 3.0  | 3.0  | 3.0  |
|  | QUBE5 | <i>Quercus berberidifolia</i>                      | 33  | 2.0  | 2.0  | 2.0  |
|  | HODI  | <i>Holodiscus discolor</i>                         | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

***Pseudotsuga menziesii* – *Arbutus menziesii* Association**

n = 3

| Lifeform     | Code   | Botanical Name                                   | Con | Avg | Min | Max |
|--------------|--------|--|-----|-----|-----|-----|
| Herb         |        |  |     |     |     |     |
|              | TOAR   | <i>Torilis arvensis</i>                          | 67  | 0.6 | 0.2 | 1.0 |
|              | CYEC   | <i>Cynosurus echinatus</i>                       | 33  | 3.0 | 3.0 | 3.0 |
|              | IRIS   | <i>Iris</i>                                      | 33  | 0.2 | 0.2 | 0.2 |
|              | TRBOL  | <i>Trientalis borealis</i> ssp. <i>latifolia</i> | 33  | 0.2 | 0.2 | 0.2 |
|              | HIAL2  | <i>Hieracium albiflorum</i>                      | 33  | 0.2 | 0.2 | 0.2 |
|              | FECA   | <i>Festuca californica</i>                       | 33  | 0.2 | 0.2 | 0.2 |
|              | IRDO   | <i>Iris douglasiana</i>                          | 33  | 0.2 | 0.2 | 0.2 |
|              | GALIU  | <i>Galium</i>                                    | 33  | 0.2 | 0.2 | 0.2 |
| Non-vascular |        |  |     |     |     |     |
|              | 2LICHN | Lichen   | 67  | 0.2 | 0.2 | 0.2 |
|              | 2MOSS  | Moss   | 33  | 0.2 | 0.2 | 0.2 |

***Pseudotsuga menziesii* – *Quercus agrifolia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (6) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 65.7         | 45–80         | –          |
| Herb                          | 10.1         | 1–36          | <0.5–1     |
| Shrub                         | 7.0          | 0.2–25        | 0.5–5      |
| Regenerating/understory tree* | 6.3          | 0–13          | 2–10       |
| Hardwood                      | 31.3         | 18–50         | 5–20       |
| Conifer                       | 24.9         | 10–45         | 2–35       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (3), SW (2)

**Macrotopography:** lower to middle 1/3 of slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (2), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (2), flat (1), undulating (3)

**Parent material:** Franciscan melange (5), sandstone (2)

**Soil texture:** clay or clay loam (2), silt or silt loam (1)

**Slope steepness:** moderate/6–25° (4), steep/>25° (2)

|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1002 ft. | 472–1820 ft. |
| Slope             | 23.0°    | 15–35°       |
| Large rock cover  | 0.8%     | 0–2%         |
| Small rock cover  | 1.8%     | 0–7%         |
| Bare ground cover | 8.6%     | 2–20%        |
| Litter cover      | 86.4%    | 75–93%       |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** MILOB109, MILOB118, SONO0150, SONO0583, SONO0623, SONO0945, SONO0946

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Pseudotsuga menziesii* – *Quercus agrifolia* Association**

n = 7

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            |             |  |            |            |            |            |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                 | 100        | 24.9       | 10.0       | 45.0       |
|  | QUAG        | * <i>Quercus agrifolia</i>                     | 100        | 19.6       | 8.0        | 40.0       |
|  | UMCA        | * <i>Umbellularia californica</i>              | 57         | 7.1        | 0.2        | 15.0       |
|  | ARME        | * <i>Arbutus menziesii</i>                     | 43         | 14.0       | 10.0       | 20.0       |
|  | QUGA4       | <i>Quercus garryana</i>                        | 29         | 4.5        | 4.0        | 5.0        |
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                 | 100        | 5.4        | 0.4        | 13.0       |
|  | QUAG        | * <i>Quercus agrifolia</i>                     | 100        | 0.5        | 0.2        | 1.0        |
|  | UMCA        | * <i>Umbellularia californica</i>              | 57         | 2.0        | 0.2        | 4.2        |
|  | NODE3       | <i>Notholithocarpus densiflorus</i>            | 43         | 1.1        | 0.2        | 3.0        |
|  | ARME        | * <i>Arbutus menziesii</i>                     | 43         | 0.6        | 0.2        | 1.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i>              | 86         | 4.9        | 0.2        | 15.0       |
|  | LOHI2       | <i>Lonicera hispidula</i>                      | 71         | 0.5        | 0.2        | 1.0        |
|  | COCOC       | <i>Corylus cornuta</i> var. <i>californica</i> | 57         | 0.2        | 0.2        | 0.2        |
|  | RUUR        | <i>Rubus ursinus</i>                           | 29         | 7.6        | 0.2        | 15.0       |
|  | FRCA12      | <i>Frangula californica</i>                    | 29         | 2.0        | 1.0        | 3.0        |
|  | HEAR5       | <i>Heteromeles arbutifolia</i>                 | 29         | 1.1        | 0.2        | 2.0        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | CYEC        | <i>Cynosurus echinatus</i>                     | 71         | 3.5        | 0.2        | 12.0       |
|  | CAREX       | <i>Carex</i>                                   | 57         | 0.9        | 0.2        | 3.0        |
|  | ELGL        | <i>Elymus glaucus</i>                          | 43         | 1.4        | 0.2        | 3.0        |
|  | CHPO3       | <i>Chlorogalum pomeridianum</i>                | 43         | 0.2        | 0.2        | 0.2        |
|  | PETR7       | <i>Pentagramma triangularis</i>                | 43         | 0.2        | 0.2        | 0.2        |
|  | BRMA        | <i>Briza maxima</i>                            | 29         | 5.5        | 4.0        | 7.0        |
|  | CLDO2       | <i>Clinopodium douglasii</i>                   | 29         | 2.6        | 0.2        | 5.0        |
|  | CYGR        | <i>Cynoglossum grande</i>                      | 29         | 0.6        | 0.2        | 1.0        |
|  | METO        | <i>Melica torreyana</i>                        | 29         | 0.6        | 0.2        | 1.0        |
|  | POMU        | <i>Polystichum munitum</i>                     | 29         | 0.6        | 0.2        | 1.0        |
|  | GALIU       | <i>Galium</i>                                  | 29         | 0.2        | 0.2        | 0.2        |
|  | GAAP2       | <i>Galium aparine</i>                          | 29         | 0.2        | 0.2        | 0.2        |
|  | IRIS        | <i>Iris</i>                                    | 29         | 0.2        | 0.2        | 0.2        |
|  | MAFA3       | <i>Marah fabaceus</i>                          | 29         | 0.2        | 0.2        | 0.2        |
|  | OSBE        | <i>Osmorhiza berteroi</i>                      | 29         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Pseudotsuga menziesii* – *Quercus agrifolia* Association**

n = 7

| Lifeform            | Code   | Botanical Name                                   | Con | Avg | Min | Max |
|---------------------|--------|--|-----|-----|-----|-----|
| Herb                | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 29  | 0.2 | 0.2 | 0.2 |
|                     | TOAR   | <i>Torilis arvensis</i>                          | 29  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |  |     |     |     |     |
|                     | 2MOSS  | Moss   | 57  | 1.8 | 0.2 | 4.0 |
|                     | 2LICHN | Lichen   | 29  | 0.6 | 0.2 | 1.0 |

***Pseudotsuga menziesii* – *Quercus chrysolepis* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2), Coastal Franciscan/263Ag (8), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 50.2         | 33–73         | –          |
| <b>Herb</b>                          | 7.1          | 0–45          | <0.5–1     |
| <b>Shrub</b>                         | 4.6          | 0–15          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 9.5          | 0–26          | 1–20       |
| <b>Hardwood</b>                      | 24.9         | 4–55          | 2–20       |
| <b>Conifer</b>                       | 18.1         | 1–38          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (2), SW (5), variable (2)

**Macrotopography:** lower 1/3 of slope (1), lower to middle 1/3 of slope (1), middle 1/3 of slope (2), middle to upper 1/3 of slope (1), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (4)

**Microtopography:** concave (1), convex (5), flat (1), undulating (4)

**Parent material:** Franciscan melange (7), sandstone (3), volcanic (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** moderate/6–25° (5), steep/>25° (6)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1236 ft. | 434–2247 ft. |
| <b>Slope</b>             | 25.9°    | 7–40°        |
| <b>Large rock cover</b>  | 1.4%     | 0–9%         |
| <b>Small rock cover</b>  | 10.5%    | 1–32%        |
| <b>Bare ground cover</b> | 22.5%    | 2–56%        |
| <b>Litter cover</b>      | 63.5%    | 35–95%       |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** MILOB014, SONO0246, SONO0594, SONO0657, SONO0658, SONO0659, SONO0731, SONO0864, SONO0868, SONO0876, SONO0965

**Relevés:** none

SCV Global/State Rank: G4/S4<sup>1</sup>

**STAND TABLE**

***Pseudotsuga menziesii* – *Quercus chrysolepis* Association**

n = 11

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|-------|---|-----|------|-----|------|
| <b>Tree</b>                            |       |   |     |      |     |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 100 | 18.1 | 1.0 | 38.0 |
|  | QUCH2 | * <i>Quercus chrysolepis</i>                        | 91  | 14.5 | 1.0 | 33.0 |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 73  | 2.9  | 0.2 | 7.0  |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 64  | 8.7  | 0.2 | 35.0 |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i>               | 36  | 1.1  | 0.2 | 2.0  |
|  | QUWI2 | * <i>Quercus wislizeni</i>                          | 27  | 9.3  | 5.0 | 15.0 |
|  | QUKE  | <i>Quercus kelloggii</i>                            | 27  | 3.3  | 3.0 | 4.0  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |     |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 100 | 6.5  | 0.2 | 25.2 |
|  | QUCH2 | * <i>Quercus chrysolepis</i>                        | 82  | 3.3  | 0.2 | 10.0 |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 64  | 0.5  | 0.2 | 1.2  |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 55  | 1.2  | 0.2 | 4.0  |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i>               | 45  | 1.6  | 0.4 | 4.2  |
|  | QUWI2 | * <i>Quercus wislizeni</i>                          | 36  | 0.3  | 0.2 | 0.4  |
| <b>Shrub</b>                           |       |   |     |      |     |      |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 55  | 1.9  | 0.2 | 4.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                     | 45  | 2.4  | 2.0 | 3.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 45  | 1.1  | 0.2 | 2.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>                           | 27  | 0.7  | 0.2 | 1.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 27  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |       |   |     |      |     |      |
|  | CAREX | <i>Carex</i>  | 45  | 0.4  | 0.2 | 1.0  |
|  | CYEC  | <i>Cynosurus echinatus</i>                          | 36  | 1.1  | 0.2 | 2.0  |
|  | FECA  | <i>Festuca californica</i>                          | 27  | 7.1  | 0.2 | 20.0 |
| <b>Non-vascular</b>                    |       |   |     |      |     |      |
|  | 2MOSS | Moss  | 82  | 4.2  | 0.2 | 14.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Pseudotsuga menziesii* – *Umbellularia californica* / *Polystichum munitum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 84.0         | 70–95         | –          |
| Herb             | 21.3         | 10–27         | 0.5–2      |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Shrub</b>                         | 18.0         | 3–28          | 1–5        |
| <b>Regenerating/understory tree*</b> | 4.7          | 0–10          | 5–10       |
| <b>Hardwood</b>                      | 10.1         | 0–27          | 2–15       |
| <b>Conifer</b>                       | 42.0         | 31–60         | 10–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), variable (1)

**Macrotopography:** bottom to lower 1/3 of slope (1), lower to middle 1/3 of slope (2)

**Microtopography:** convex (2), undulating (1)

**Parent material:** Franciscan melange (2), sedimentary (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (2), steep/>25° (1)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 506 ft. | 38–778 ft. |
| <b>Slope</b>             | 29.3°   | 15–48°     |
| <b>Large rock cover</b>  | 0.1%    | 0–0.2%     |
| <b>Small rock cover</b>  | 4.1%    | 0–7%       |
| <b>Bare ground cover</b> | 18.0%   | 12–30%     |
| <b>Litter cover</b>      | 75.0%   | 65–80%     |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0022, SONO0092, SONO0604

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Pseudotsuga menziesii* – *Umbellularia californica* / *Polystichum munitum* Association**

n = 3

| Lifeform                               | Code   | Botanical Name                            | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            | PSME   | * <i>Pseudotsuga menziesii</i>            | 100 | 42.0 | 31.0 | 60.0 |
|  | UMCA   | * <i>Umbellularia californica</i>         | 100 | 6.4  | 0.2  | 16.0 |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>       | 33  | 8.0  | 8.0  | 8.0  |
|  | ALRU2  | <i>Alnus rubra</i>                        | 33  | 2.0  | 2.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> | PSME   | * <i>Pseudotsuga menziesii</i>            | 67  | 6.1  | 2.0  | 10.2 |
|  | UMCA   | * <i>Umbellularia californica</i>         | 67  | 1.1  | 0.2  | 2.0  |
|  | QUAG   | <i>Quercus agrifolia</i>                  | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 67  | 8.0  | 1.0  | 15.0 |
|  | RUUR   | <i>Rubus ursinus</i>                      | 67  | 6.0  | 2.0  | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Pseudotsuga menziesii* – *Umbellularia californica* / *Polystichum munitum* Association**

n = 3

| Lifeform            | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|---------------------|--------|--|-----|------|------|------|
| <b>Shrub</b>        |        |  |     |      |      |      |
|                     | FRCA12 | <i>Frangula californica</i>                    | 67  | 1.0  | 1.0  | 1.0  |
|                     | LOHI2  | <i>Lonicera hispidula</i>                      | 67  | 0.6  | 0.2  | 1.0  |
|                     | TODI   | <i>Toxicodendron diversilobum</i>              | 67  | 0.6  | 0.2  | 1.0  |
|                     | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i> | 33  | 12.0 | 12.0 | 12.0 |
|                     | MOCA6  | <i>Morella californica</i>                     | 33  | 5.0  | 5.0  | 5.0  |
|                     | RUPA   | <i>Rubus parviflorus</i>                       | 33  | 2.0  | 2.0  | 2.0  |
|                     | RISA   | <i>Ribes sanguineum</i>                        | 33  | 1.0  | 1.0  | 1.0  |
|                     | VAOV2  | <i>Vaccinium ovatum</i>                        | 33  | 1.0  | 1.0  | 1.0  |
|                     | RUSP   | <i>Rubus spectabilis</i>                       | 33  | 1.0  | 1.0  | 1.0  |
|                     | BAPI   | <i>Baccharis pilularis</i>                     | 33  | 0.2  | 0.2  | 0.2  |
|                     | GAEL   | <i>Garrya elliptica</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|                     | ILAQ80 | <i>Ilex aquifolium</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|                     | ROGY   | <i>Rosa gymnocarpa</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|                     | RUAR9  | <i>Rubus armeniacus</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|                     | SYAL   | <i>Symphoricarpos albus</i>                    | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |  |     |      |      |      |
|                     | POMU   | <i>Polystichum munitum</i>                     | 100 | 20.3 | 10.0 | 26.0 |
|                     | HOLA   | <i>Holcus lanatus</i>                          | 33  | 2.0  | 2.0  | 2.0  |
|                     | MARAH  | <i>Marah</i>                                   | 33  | 0.2  | 0.2  | 0.2  |
|                     | URDI   | <i>Urtica dioica</i>                           | 33  | 0.2  | 0.2  | 0.2  |
|                     | PRSM   | <i>Prosartes smithii</i>                       | 33  | 0.2  | 0.2  | 0.2  |
|                     | HEHE   | <i>Hedera helix</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|                     | DRAR3  | <i>Dryopteris arguta</i>                       | 33  | 0.2  | 0.2  | 0.2  |
|                     | STAJ   | <i>Stachys ajugoides</i>                       | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |  |     |      |      |      |
|                     | 2MOSS  | Moss   | 100 | 6.4  | 0.2  | 12.0 |
|                     | 2LICHN | Lichen   | 33  | 2.0  | 2.0  | 2.0  |

***Pseudotsuga menziesii* – *Umbellularia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (9), and Mount St. Helena Flows and Valleys/263Am (7) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 56.6         | 37–75         | –          |
| <b>Herb</b>                          | 5.0          | 1–16          | <0.5–2     |
| <b>Shrub</b>                         | 5.1          | 0.2–10        | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 12.4         | 0.2–30        | <0.5–15    |
| <b>Hardwood</b>                      | 20.1         | 7–43          | 5–50       |
| <b>Conifer</b>                       | 29.4         | 13–53         | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (6), SE (5), SW (2), variable (2)  
**Macrotopography:** bottom (1), bottom to mid 1/3 of slope (2),  
 bottom to upper 1/3 of slope (1), lower to middle 1/3 of slope (1),  
 lower to upper 1/3 of slope (5), middle 1/3 of slope (2), middle to upper 1/3 of slope (2),  
 upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (2)  
**Microtopography:** concave (6), convex (3), flat (3), undulating (5)  
**Parent material:** Franciscan melange (2), metasedimentary (2), mixed alluvium (2),  
 rhyolite (2), sandstone (3), sedimentary (2), volcanic (4)  
**Soil texture:** clay or clay loam (7), loam or sandy loam (1)  
**Slope steepness:** gentle/1-5° (1), moderate/6-25° (7), steep/>25° (9)

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 794 ft. | 138–1571 ft. |
| Slope             | 22.1°   | 2–33°        |
| Large rock cover  | 0.8%    | 0–8%         |
| Small rock cover  | 4.9%    | 0–20%        |
| Bare ground cover | 17.8%   | 3–78%        |
| Litter cover      | 74.6%   | 20–94%       |

**Samples Used to Describe Association (n=17)**

**Rapid Assessments:** SONO0094, SONO0152, SONO0156, SONO0172, SONO0195, SONO0213,  
 SONO0313, SONO0319, SONO0329, SONO0361, SONO0381, SONO0706, SONO0850,  
 SONO0854, SONO0874, SONO0999  
**Relevés:** SONO0115

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Pseudotsuga menziesii* – *Umbellularia californica* Association**

n = 17

| Lifeform                        | Code  | Botanical Name                      | Con | Avg  | Min  | Max  |
|---------------------------------|-------|-------------------------------------|-----|------|------|------|
| Tree                            | PSME  | * <i>Pseudotsuga menziesii</i>      | 100 | 28.8 | 13.0 | 47.0 |
|                                 | UMCA  | * <i>Umbellularia californica</i>   | 100 | 14.8 | 2.0  | 39.0 |
|                                 | ARME  | * <i>Arbutus menziesii</i>          | 76  | 3.4  | 0.2  | 13.0 |
|                                 | QUKE  | <i>Quercus kelloggii</i>            | 35  | 2.4  | 0.2  | 5.0  |
|                                 | QUCH2 | <i>Quercus chrysolepis</i>          | 24  | 1.3  | 0.2  | 3.0  |
| Regenerating or Understory Tree | UMCA  | * <i>Umbellularia californica</i>   | 82  | 9.7  | 0.2  | 30.0 |
|                                 | PSME  | * <i>Pseudotsuga menziesii</i>      | 82  | 4.8  | 0.2  | 16.2 |
|                                 | ARME  | * <i>Arbutus menziesii</i>          | 29  | 3.0  | 0.2  | 12.0 |
|                                 | NODE3 | <i>Notholithocarpus densiflorus</i> | 24  | 1.7  | 0.2  | 5.0  |
| Shrub                           | TODI  | <i>Toxicodendron diversilobum</i>   | 94  | 1.4  | 0.2  | 7.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Pseudotsuga menziesii* – *Umbellularia californica* Association**

n = 17

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Shrub</b>        | LOHI2       | <i>Lonicera hispidula</i>                        | 59         | 1.9        | 0.2        | 5.0        |
|                     | COCOC       | <i>Corylus cornuta</i> var. <i>californica</i>   | 41         | 0.5        | 0.2        | 1.0        |
|                     | ROGY        | <i>Rosa gymnocarpa</i>                           | 24         | 0.9        | 0.2        | 3.0        |
| <b>Herb</b>         | ATFI        | <i>Athyrium filix-femina</i>                     | 41         | 2.8        | 0.2        | 8.0        |
|                     | POMU        | <i>Polystichum munitum</i>                       | 41         | 1.6        | 0.2        | 4.0        |
|                     | PETR7       | <i>Pentagramma triangularis</i>                  | 35         | 0.2        | 0.2        | 0.2        |
|                     | FECA        | <i>Festuca californica</i>                       | 24         | 1.8        | 0.2        | 5.0        |
|                     | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 24         | 1.3        | 0.2        | 3.0        |
|                     | IRIS        | <i>Iris</i>                                      | 24         | 0.2        | 0.2        | 0.2        |
|                     | CAREX       | <i>Carex</i>                                     | 24         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> | 2MOSS       | Moss   | 71         | 1.5        | 0.2        | 7.0        |



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***Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni) Alliance***  
**Mixed oak forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus agrifolia*, *Quercus douglasii*, *Quercus garryana*, *Quercus kelloggii*, *Quercus lobata* and/or *Quercus wislizeni* are co-dominant in the tree canopy with *Aesculus californica*, *Arbutus menziesii*, *Pinus sabiniana*, *Pseudotsuga menziesii*, and *Umbellularia californica*.

Allen et al. (1989, 1991) recognized a mixed oak series with 10 subseries; they based the subseries on the species composition of the woody plants since they lacked information on the herbaceous species. Their definition was followed in the 1995 edition of the *Manual of California Vegetation* (MCV) (Sawyer et al. 1995) and the subseries were listed as associations.

A careful study of the key (Allen et al. 1989, 1991) permitted some of the subseries to be placed in other alliances if the definitions allow the characteristic oak be co-dominant. For example, “valley oak and blue oak are co-dominant; coast live oak is present” becomes the *Quercus lobata* – *Quercus douglasii* Association in the *Quercus lobata* Alliance. The *Quercus wislizeni* – *Quercus douglasii* – *Pinus sabiniana* Association was placed in the *Quercus wislizeni* Alliance because the third tree is not an oak. However, some subseries remain within this alliance when three or more oaks co-dominate.

Sonoma County

Allen et al. did not analyze mixed stands with *Quercus garryana*. Hence, the single association defined in this report is a newly described representative of the mixed oak alliance. Sonoma County mixed oak forest stands are widespread, but occur mostly inland and away from the immediate coast.

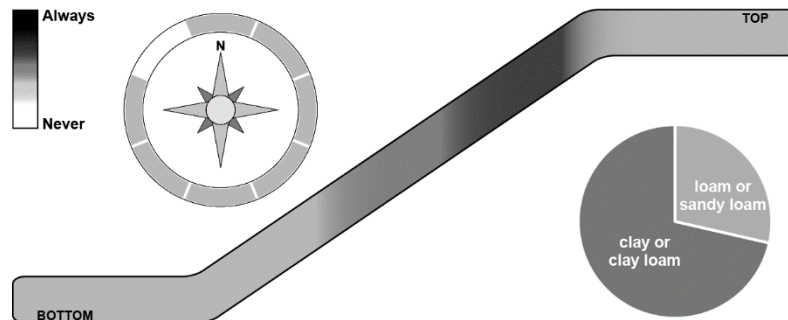
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**Local Alliance Summary (n = 15)**

**Elevation:** 168–1704 ft, mean 740 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 57.3         | 33–80         | –          |
| <b>Herb</b>                          | 21.5         | 2–60          | <0.5–2     |
| <b>Shrub</b>                         | 7.0          | 0–50          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 4.3          | 0.2–15        | <0.5–10    |
| <b>Hardwood</b>                      | 36.7         | 21–70         | 5–20       |
| <b>Conifer</b>                       | 0.5          | 0–5           | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 10.2° | 2–20°  |
| <b>Large rock cover</b>  | 0.4%  | 0–4%   |
| <b>Small rock cover</b>  | 4.6%  | 0–39%  |
| <b>Bare ground cover</b> | 18.1% | 1–60%  |
| <b>Litter cover</b>      | 75.1% | 30–97% |

**Associations within this Alliance:**

*Quercus agrifolia* – *Quercus garryana* – *Quercus kelloggii* Provisional Association

**STAND TABLE**

***Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni)* Alliance**

n = 15

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 100 | 11.1 | 2.0 | 27.0 |
|  | QUGA4 | * <i>Quercus garryana</i>         | 100 | 10.9 | 3.0 | 22.0 |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 100 | 9.0  | 0.2 | 20.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 67  | 5.5  | 0.2 | 16.0 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 47  | 4.0  | 0.2 | 12.0 |
|  | QUCH2 | <i>Quercus chrysolepis</i>        | 27  | 3.3  | 0.2 | 8.0  |
|  | AECA  | <i>Aesculus californica</i>       | 27  | 1.6  | 0.2 | 3.0  |
|  | QUDO  | <i>Quercus douglasii</i>          | 20  | 5.7  | 2.0 | 10.0 |
|  | QULO  | <i>Quercus lobata</i>             | 20  | 3.3  | 1.0 | 7.0  |
|  | QUWI2 | <i>Quercus wislizeni</i>          | 20  | 3.0  | 2.0 | 5.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 87  | 2.2  | 0.2 | 7.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 67  | 0.6  | 0.2 | 2.0  |
|  | PSME  | <i>Pseudotsuga menziesii</i>      | 40  | 2.3  | 0.2 | 9.0  |
|  | QUGA4 | * <i>Quercus garryana</i>         | 40  | 0.5  | 0.2 | 2.2  |
|  | ARME  | * <i>Arbutus menziesii</i>        | 27  | 1.8  | 0.2 | 4.2  |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 20  | 0.9  | 0.2 | 2.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 67  | 4.7  | 1.0 | 20.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 27  | 1.4  | 0.2 | 4.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 27  | 1.1  | 0.2 | 2.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 20  | 3.1  | 0.2 | 7.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus (agrifolia, douglasii, garryana, kelloggii, lobata, wislizeni)* Alliance**

n = 15

| Lifeform            | Code  | Botanical Name                  | Con | Avg  | Min | Max  |
|---------------------|-------|---------------------------------|-----|------|-----|------|
| <b>Shrub</b>        |       |                                 |     |      |     |      |
|                     | BAPI  | <i>Baccharis pilularis</i>      | 20  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>         |       |                                 |     |      |     |      |
|                     | CYEC  | <i>Cynosurus echinatus</i>      | 80  | 6.4  | 0.2 | 20.0 |
|                     | CHPO3 | <i>Chlorogalum pomeridianum</i> | 53  | 0.5  | 0.2 | 1.0  |
|                     | BRMA  | <i>Briza maxima</i>             | 47  | 11.1 | 0.2 | 50.0 |
|                     | ELGL  | <i>Elymus glaucus</i>           | 47  | 0.5  | 0.2 | 1.0  |
|                     | FECA  | <i>Festuca californica</i>      | 33  | 2.1  | 0.2 | 5.0  |
|                     | CAPY2 | <i>Carduus pycnocephalus</i>    | 27  | 0.9  | 0.2 | 3.0  |
|                     | TOAR  | <i>Torilis arvensis</i>         | 27  | 0.2  | 0.2 | 0.2  |
|                     | AVBA  | <i>Avena barbata</i>            | 20  | 0.8  | 0.2 | 2.0  |
|                     | GALIU | <i>Galium</i>                   | 20  | 0.2  | 0.2 | 0.2  |
|                     | IRIS  | <i>Iris</i>                     | 20  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b> |       |                                 |     |      |     |      |
|                     | 2MOSS | Moss                            | 47  | 0.8  | 0.2 | 2.0  |

***Quercus agrifolia* – *Quercus garryana* – *Quercus kelloggii* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (5), Coastal Franciscan/263Ag (2), Coastal Hills-Santa Rosa Plain/263Aj (2), and Mount St. Helena Flows and Valleys/263Am (6) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 57.3         | 33–80         | –          |
| <b>Herb</b>                          | 21.5         | 2–60          | <0.5–2     |
| <b>Shrub</b>                         | 7.0          | 0–50          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 4.3          | 0.2–15        | <0.5–10    |
| <b>Hardwood</b>                      | 36.7         | 21–70         | 5–20       |
| <b>Conifer</b>                       | 0.5          | 0–5           | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (4), NW (2), SE (3), variable (6)

**Macrotopography:** bottom (1), lower to middle 1/3 of slope (1), middle 1/3 of slope (1), middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (4), ridge top (1), upper 1/3 of slope (4), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (5), flat (1), undulating (7)

**Parent material:** clayey alluvium (1), Franciscan melange (3), greenstone (1), metasedimentary (1), mixed alluvium (1), sandstone (2), siltstone (1), volcanic (5)

**Soil texture:** clay or clay loam (5), loam or sandy loam (2)

**Slope steepness:** gentle/1-5° (4), moderate/6-25° (11)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 740 ft. | 168–1704 ft. |
| Slope             | 10.2°   | 2–20°        |
| Large rock cover  | 0.4%    | 0–4%         |
| Small rock cover  | 4.6%    | 0–39%        |
| Bare ground cover | 18.1%   | 1–60%        |
| Litter cover      | 75.1%   | 30–97%       |

**Samples Used to Describe Association (n=15)**

**Rapid Assessments:** SONO0056, SONO0086, SONO0219, SONO0220, SONO0383, SONO0639, SONO0643, SONO0652, SONO0690, SONO0701, SONO0717, SONO0829, SONO0865, SONO0925

**Relevés:** SONO0182

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Quercus agrifolia* – *Quercus garryana* – *Quercus kelloggii* Provisional Association**

n = 15

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 100 | 11.1 | 2.0 | 27.0 |
|  | QUGA4 | * <i>Quercus garryana</i>         | 100 | 10.9 | 3.0 | 22.0 |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 100 | 9.0  | 0.2 | 20.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 67  | 5.5  | 0.2 | 16.0 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 47  | 4.0  | 0.2 | 12.0 |
|  | QUCH2 | <i>Quercus chrysolepis</i>        | 27  | 3.3  | 0.2 | 8.0  |
|  | AECA  | <i>Aesculus californica</i>       | 27  | 1.6  | 0.2 | 3.0  |
|  | QUDO  | <i>Quercus douglasii</i>          | 20  | 5.7  | 2.0 | 10.0 |
|  | QULO  | <i>Quercus lobata</i>             | 20  | 3.3  | 1.0 | 7.0  |
|  | QUWI2 | <i>Quercus wislizeni</i>          | 20  | 3.0  | 2.0 | 5.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 87  | 2.2  | 0.2 | 7.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 67  | 0.6  | 0.2 | 2.0  |
|  | PSME  | <i>Pseudotsuga menziesii</i>      | 40  | 2.3  | 0.2 | 9.0  |
|  | QUGA4 | * <i>Quercus garryana</i>         | 40  | 0.5  | 0.2 | 2.2  |
|  | ARME  | * <i>Arbutus menziesii</i>        | 27  | 1.8  | 0.2 | 4.2  |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 20  | 0.9  | 0.2 | 2.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 67  | 4.7  | 1.0 | 20.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 27  | 1.4  | 0.2 | 4.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 27  | 1.1  | 0.2 | 2.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 20  | 3.1  | 0.2 | 7.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 20  | 0.2  | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus agrifolia* – *Quercus garryana* – *Quercus kelloggii* Provisional Association**

n = 15

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                 |            |            |            |            |
|                     | CYEC        | <i>Cynosurus echinatus</i>      | 80         | 6.4        | 0.2        | 20.0       |
|                     | CHPO3       | <i>Chlorogalum pomeridianum</i> | 53         | 0.5        | 0.2        | 1.0        |
|                     | BRMA        | <i>Briza maxima</i>             | 47         | 11.1       | 0.2        | 50.0       |
|                     | ELGL        | <i>Elymus glaucus</i>           | 47         | 0.5        | 0.2        | 1.0        |
|                     | FECA        | <i>Festuca californica</i>      | 33         | 2.1        | 0.2        | 5.0        |
|                     | CAPY2       | <i>Carduus pycnocephalus</i>    | 27         | 0.9        | 0.2        | 3.0        |
|                     | TOAR        | <i>Torilis arvensis</i>         | 27         | 0.2        | 0.2        | 0.2        |
|                     | AVBA        | <i>Avena barbata</i>            | 20         | 0.8        | 0.2        | 2.0        |
|                     | GALIU       | <i>Galium</i>                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | IRIS        | <i>Iris</i>                     | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                                 |            |            |            |            |
|                     | 2MOSS       | Moss                            | 47         | 0.8        | 0.2        | 2.0        |

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## ***Quercus agrifolia* Alliance**

### **Coast live oak woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus agrifolia* is dominant or co-dominant in the tree canopy with *Acer macrophyllum*, *Acer negundo*, *Arbutus menziesii*, *Juglans californica*, *Platanus racemosa*, *Populus fremontii*, *Quercus douglasii*, *Quercus engelmannii*, *Quercus kelloggii*, *Quercus lobata*, *Salix lasiolepis*, and *Umbellularia californica*.

Stands of this extensive alliance vary from upland savannas and woodlands to bottomland, riparian forests with closed tree canopies (Allen-Diaz et al. 2007). Genetic variation is high in the species, with two main recognized varieties. Most plants represent *Quercus agrifolia* var. *agrifolia*; plants recognized as *Quercus agrifolia* var. *oxyadenia* in the Peninsular Ranges of southern California have hairs completely covering the lower leaf surfaces (Roberts 1995). *Quercus agrifolia* hybrids include *Quercus* × *ganderi* (*Q. agrifolia* var. *oxyadenia* × *Q. kelloggii*) in San Diego County and *Quercus* × *chasei* (*Q. agrifolia* var. *agrifolia* × *Q. kelloggii*) in Monterey and Santa Cruz Counties. The species also hybridizes with *Quercus dumosa*, *Q. lobata*, and *Q. wislizeni* to varying degrees (Kathleen et al. 2002, Dodd et al. 1993, Brophy and Parnell 1974). A shrub form, *Quercus agrifolia* var. *frutescens*, may only represent frequently burned or salt-spray-pruned plants.

### Sonoma County

*Quercus agrifolia* Alliance stands in Sonoma County cover the range from mesic woodlands (in which *Quercus agrifolia* mixes with *Umbellularia* and *Arbutus*), to relatively dry, open woodlands with grassy understories.

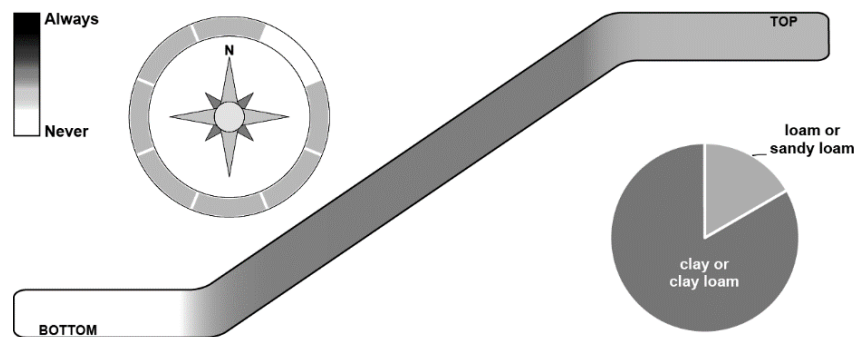
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### **Local Alliance Summary (n = 26)**

**Elevation:** 183–1665 ft, mean 968 ft

**SCV Global/State Rank:** G5/S4<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.7         | 28–80         | –          |
| <b>Herb</b>                          | 17.7         | 0–70          | <0.5–1     |
| <b>Shrub</b>                         | 5.7          | 0–30          | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 2.8          | 0–28          | <0.5–15    |
| <b>Hardwood</b>                      | 40.2         | 6–70          | 2–20       |
| <b>Conifer</b>                       | 0.5          | 0–6           | 15–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 18.8° | 3–38°  |
| <b>Large rock cover</b>  | 1.4%  | 0–8%   |
| <b>Small rock cover</b>  | 3.8%  | 0–21%  |
| <b>Bare ground cover</b> | 10.8% | 0–50%  |
| <b>Litter cover</b>      | 81.8% | 40–97% |

**Associations within this Alliance:**

*Quercus agrifolia* – *Arbutus menziesii* – *Umbellularia californica* Association

*Quercus agrifolia* / Grass Association

*Quercus agrifolia* / *Toxicodendron diversilobum* Association

**STAND TABLE**

***Quercus agrifolia* Alliance**

n = 26

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 100 | 33.8 | 6.0 | 70.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 50  | 5.3  | 0.2 | 18.0 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 35  | 7.6  | 0.2 | 25.0 |
|  | QUKE  | <i>Quercus kelloggii</i>          | 31  | 2.4  | 0.2 | 5.0  |
|  | QUGA4 | <i>Quercus garryana</i>           | 23  | 1.9  | 0.2 | 5.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 77  | 1.4  | 0.2 | 8.0  |
|  | UMCA  | * <i>Umbellularia californica</i> | 58  | 2.5  | 0.2 | 23.0 |
|  | PSME  | <i>Pseudotsuga menziesii</i>      | 42  | 0.9  | 0.2 | 4.0  |
|  | ARME  | * <i>Arbutus menziesii</i>        | 38  | 0.8  | 0.2 | 5.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 69  | 5.3  | 0.2 | 30.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 46  | 1.7  | 0.2 | 10.0 |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 38  | 1.1  | 0.2 | 5.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 23  | 2.6  | 0.2 | 12.0 |
|  | BAPI  | <i>Baccharis pilularis</i>        | 23  | 0.3  | 0.2 | 1.0  |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 69  | 3.2  | 0.2 | 10.0 |
|  | TOAR  | <i>Torilis arvensis</i>           | 62  | 0.7  | 0.2 | 5.0  |
|  | BRMA  | <i>Briza maxima</i>               | 54  | 6.1  | 0.2 | 28.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus agrifolia* Alliance**

n = 26

| Lifeform            | Code  | Botanical Name               | Con | Avg | Min | Max  |
|---------------------|-------|------------------------------|-----|-----|-----|------|
| <b>Herb</b>         |       |                              |     |     |     |      |
|                     | BRDI3 | <i>Bromus diandrus</i>       | 50  | 4.2 | 0.2 | 15.0 |
|                     | ELGL  | <i>Elymus glaucus</i>        | 50  | 0.5 | 0.2 | 3.0  |
|                     | AVBA  | <i>Avena barbata</i>         | 35  | 7.3 | 0.2 | 15.0 |
|                     | CAPY2 | <i>Carduus pycnocephalus</i> | 27  | 1.6 | 0.2 | 5.0  |
| <b>Non-vascular</b> |       |                              |     |     |     |      |
|                     | 2MOSS | Moss                         | 54  | 1.1 | 0.2 | 3.0  |

***Quercus agrifolia* – *Arbutus menziesii* – *Umbellularia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2), Coastal Franciscan/263Ag (1), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 53.0         | 42–70         | –          |
| <b>Herb</b>                          | 7.7          | 0–20          | <0.5–1     |
| <b>Shrub</b>                         | 7.7          | 1–26          | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 2.7          | 0.2–9         | <0.5–10    |
| <b>Hardwood</b>                      | 45.7         | 30–60         | 5–20       |
| <b>Conifer</b>                       | 0.4          | 0–3           | 15–20      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (2), SW (3)

**Macrotopography:** lower 1/3 of slope (2), lower to middle 1/3 of slope (1), middle 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (3), convex (3), flat (1)

**Parent material:** blue schist (1), Franciscan melange (1), greenstone (1), mixed alluvium (1), ultramafic (2), volcanic (1)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** moderate/6-25° (4), steep/>25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 981 ft. | 295–1566 ft. |
| <b>Slope</b>             | 19.6°   | 8–30°        |
| <b>Large rock cover</b>  | 1.9%    | 0–7%         |
| <b>Small rock cover</b>  | 4.9%    | 0–15%        |
| <b>Bare ground cover</b> | 10.0%   | 0–33%        |
| <b>Litter cover</b>      | 81.0%   | 50–97%       |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** SONO0012, SONO0110, SONO0212, SONO0390, SONO0619, SONO0625, SONO0642

**Relevés:** none



SCV Global/State Rank: G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus agrifolia* – *Arbutus menziesii* – *Umbellularia californica* Association**

n = 7

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 100 | 31.9 | 12.0 | 53.0 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 100 | 9.5  | 0.2  | 25.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 71  | 6.2  | 2.0  | 11.0 |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 57  | 2.1  | 0.2  | 4.0  |
|  | QUGA4 | <i>Quercus garryana</i>           | 29  | 2.1  | 0.2  | 4.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 86  | 0.7  | 0.2  | 1.2  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 71  | 0.8  | 0.2  | 2.0  |
|  | PSME  | <i>Pseudotsuga menziesii</i>      | 71  | 0.4  | 0.2  | 1.2  |
|  | ARME  | * <i>Arbutus menziesii</i>        | 57  | 1.8  | 0.2  | 5.2  |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 29  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 86  | 3.2  | 0.2  | 14.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 86  | 3.0  | 0.2  | 10.0 |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 57  | 1.3  | 0.2  | 3.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 43  | 0.2  | 0.2  | 0.2  |
|  | RUUR  | <i>Rubus ursinus</i>              | 29  | 0.6  | 0.2  | 1.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 29  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 71  | 3.0  | 0.2  | 7.0  |
|  | BRMA  | <i>Briza maxima</i>               | 57  | 5.3  | 1.0  | 13.0 |
|  | ELGL  | <i>Elymus glaucus</i>             | 57  | 0.9  | 0.2  | 3.0  |
|  | TOAR  | <i>Torilis arvensis</i>           | 57  | 0.2  | 0.2  | 0.2  |
|  | BRLA3 | <i>Bromus laevipes</i>            | 29  | 1.6  | 0.2  | 3.0  |
|  | PETR7 | <i>Pentagramma triangularis</i>   | 29  | 0.2  | 0.2  | 0.2  |
|  | POCA5 | <i>Polygala californica</i>       | 29  | 0.2  | 0.2  | 0.2  |
|  | CHPO3 | <i>Chlorogalum pomeridianum</i>   | 29  | 0.2  | 0.2  | 0.2  |
|  | FECA  | <i>Festuca californica</i>        | 29  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |       |                                   |     |      |      |      |
|  | 2MOSS | Moss                              | 71  | 1.4  | 0.2  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus agrifolia* / Grass Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (7), Coastal Franciscan/263Ag (2), and Mount St. Helena Flows and Valleys/263Am (4) USDA Ecological Subsections (Miles and Goudey 1997).

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 53.6         | 28–75         | –          |
| <b>Herb</b>                          | 28.7         | 3–70          | <0.5–1     |
| <b>Shrub</b>                         | 3.2          | 0–13          | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 1.1          | 0–8           | <0.5–5     |
| <b>Hardwood</b>                      | 32.2         | 6–50          | 2–20       |
| <b>Conifer</b>                       | 0.0          | 0–0           | 20–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2), SE (5), SW (5), variable (1)

**Macrotopography:** lower 1/3 of slope (2), lower to upper 1/3 of slope (1), middle 1/3 of slope (3), middle to upper 1/3 of slope (1), upper 1/3 of slope (3), upper 1/3 of slope to ridgetop (3)

**Microtopography:** convex (5), flat (4), undulating (4)

**Parent material:** andesite (1), conglomerate (1), Franciscan melange (2), greenstone (3), mixed alluvium (1), rhyolite (1), sandstone (1), ultramafic (1), volcanic (2)

**Soil texture:** clay or clay loam (4), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (8), steep/>25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 966 ft. | 183–1665 ft. |
| <b>Slope</b>             | 17.8°   | 3–38°        |
| <b>Large rock cover</b>  | 1.1%    | 0–8%         |
| <b>Small rock cover</b>  | 4.1%    | 0–21%        |
| <b>Bare ground cover</b> | 11.7%   | 1–50%        |
| <b>Litter cover</b>      | 81.1%   | 40–97%       |

**Samples Used to Describe Association (n=13)**

**Rapid Assessments:** SONO0051, SONO0063, SONO0068, SONO0075, SONO0136, SONO0153, SONO0184, SONO0216, SONO0283, SONO0645, SONO0691, SONO0860, SONO0942

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus agrifolia* / Grass Association**

n = 13

| Lifeform | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|----------|-------|-----------------------------------|-----|------|-----|------|
| Tree     | QUAG  | * <i>Quercus agrifolia</i>        | 100 | 29.6 | 6.0 | 45.0 |
|          | UMCA  | * <i>Umbellularia californica</i> | 38  | 0.9  | 0.2 | 3.0  |
|          | QUGA4 | <i>Quercus garryana</i>           | 31  | 1.9  | 0.2 | 5.0  |
|          | QUKE  | <i>Quercus kelloggii</i>          | 23  | 2.1  | 0.2 | 4.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus agrifolia* / Grass Association**

n = 13

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min | Max  |
|--|--------|-----------------------------------|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |     |      |
|  | QUAG   | * <i>Quercus agrifolia</i>        | 69  | 1.1  | 0.2 | 8.0  |
|  | ARME   | <i>Arbutus menziesii</i>          | 38  | 0.2  | 0.2 | 0.2  |
|  | UMCA   | * <i>Umbellularia californica</i> | 31  | 0.6  | 0.2 | 1.2  |
|  | PSME   | <i>Pseudotsuga menziesii</i>      | 23  | 0.2  | 0.2 | 0.2  |
| <b>Shrub</b>                           |        |                                   |     |      |     |      |
|  | TODI   | <i>Toxicodendron diversilobum</i> | 46  | 1.3  | 0.2 | 7.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>    | 23  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |        |                                   |     |      |     |      |
|  | BRDI3  | <i>Bromus diandrus</i>            | 77  | 4.9  | 0.2 | 15.0 |
|  | AVBA   | <i>Avena barbata</i>              | 62  | 8.2  | 0.2 | 15.0 |
|  | BRMA   | <i>Briza maxima</i>               | 62  | 8.0  | 0.2 | 28.0 |
|  | CYEC   | <i>Cynosurus echinatus</i>        | 62  | 4.3  | 0.2 | 10.0 |
|  | TOAR   | <i>Torilis arvensis</i>           | 62  | 0.4  | 0.2 | 1.0  |
|  | CAPY2  | <i>Carduus pycnocephalus</i>      | 38  | 2.1  | 0.2 | 5.0  |
|  | ELGL   | <i>Elymus glaucus</i>             | 38  | 0.4  | 0.2 | 1.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>          | 31  | 16.0 | 6.0 | 35.0 |
|  | TRHI4  | <i>Trifolium hirtum</i>           | 31  | 1.9  | 0.2 | 5.0  |
|  | IRIS   | <i>Iris</i>                       | 23  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |                                   |     |      |     |      |
|  | 2MOSS  | Moss                              | 54  | 0.8  | 0.2 | 2.0  |
|  | 2LICHN | Lichen                            | 31  | 0.9  | 0.2 | 2.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus agrifolia* / *Toxicodendron diversilobum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (4) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 63.5         | 43–80         | –          |
| <b>Herb</b>                          | 5.7          | 0–10          | <0.5–1     |
| <b>Shrub</b>                         | 9.4          | 0.2–30        | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 6.8          | 0–28          | 0.5–15     |
| <b>Hardwood</b>                      | 51.2         | 35–70         | 5–20       |
| <b>Conifer</b>                       | 1.7          | 0–6           | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SE (1), SW (3), variable (1)

**Macrotopography:** lower 1/3 of slope (2), lower to upper 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Summary of Environmental Data, continued**

**Microtopography:** concave (1), convex (2), flat (2), undulating (1)

**Parent material:** andesite (1), Franciscan melange (2), sandstone (1), ultramafic (1), volcanic (1)

**Soil texture:** clay or clay loam (4), loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (4), steep/>25° (2)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 956 ft. | 257–1549 ft. |
| <b>Slope</b>             | 20.0°   | 8–32°        |
| <b>Large rock cover</b>  | 1.5%    | 0–5%         |
| <b>Small rock cover</b>  | 1.8%    | 0–6%         |
| <b>Bare ground cover</b> | 9.8%    | 2–17%        |
| <b>Litter cover</b>      | 84.0%   | 72–93%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** MILOB114, SONO0014, SONO0173, SONO0844

**Relevés:** SONO0181, SONO0183

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus agrifolia* / *Toxicodendron diversilobum* Association**

n = 6

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 100 | 45.3 | 29.0 | 70.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 50  | 11.0 | 5.0  | 18.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 33  | 5.0  | 4.0  | 6.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 100 | 2.3  | 0.2  | 6.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 83  | 6.2  | 0.4  | 23.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 50  | 2.4  | 0.2  | 4.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 100 | 11.4 | 0.2  | 30.0 |
|  | LOHI2  | <i>Lonicera hispidula</i>                           | 67  | 0.2  | 0.2  | 0.2  |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 50  | 0.5  | 0.2  | 1.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 50  | 0.5  | 0.2  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 50  | 0.5  | 0.2  | 1.0  |
|  | SYMO   | <i>Symphoricarpos mollis</i>                        | 33  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | CYEC   | <i>Cynosurus echinatus</i>                          | 83  | 1.7  | 0.2  | 4.0  |
|  | TOAR   | <i>Torilis arvensis</i>                             | 67  | 1.9  | 0.2  | 5.0  |
|  | ELGL   | <i>Elymus glaucus</i>                               | 67  | 0.2  | 0.2  | 0.2  |
|  | BRDI3  | <i>Bromus diandrus</i>                              | 50  | 2.1  | 0.2  | 4.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 33  | 1.5  | 1.0  | 2.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus agrifolia* / *Toxicodendron diversilobum* Association**

n = 6

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                 |            |            |            |            |
|                     | BRCA5       | <i>Bromus carinatus</i>         | 33         | 0.6        | 0.2        | 1.0        |
|                     | LATHY       | <i>Lathyrus</i>                 | 33         | 0.6        | 0.2        | 1.0        |
|                     | OSBE        | <i>Osmorhiza berteroi</i>       | 33         | 0.2        | 0.2        | 0.2        |
|                     | TORIL       | <i>Torilis</i>                  | 33         | 0.2        | 0.2        | 0.2        |
|                     | PETR7       | <i>Pentagramma triangularis</i> | 33         | 0.2        | 0.2        | 0.2        |
|                     | BRMA        | <i>Briza maxima</i>             | 33         | 0.2        | 0.2        | 0.2        |
|                     | CHPO3       | <i>Chlorogalum pomeridianum</i> | 33         | 0.2        | 0.2        | 0.2        |
|                     | STAJ        | <i>Stachys ajugoides</i>        | 33         | 0.2        | 0.2        | 0.2        |
|                     | CAPY2       | <i>Carduus pycnocephalus</i>    | 33         | 0.2        | 0.2        | 0.2        |
|                     | HYRA3       | <i>Hypochaeris radicata</i>     | 33         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                                 |            |            |            |            |
|                     | 2MOSS       | Moss                            | 33         | 1.6        | 0.2        | 3.0        |

***Quercus chrysolepis* (tree) Alliance**  
 Canyon live oak forest

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus chrysolepis* is dominant or co-dominant in the tree canopy with *Abies concolor*, *Acer macrophyllum*, *Arbutus menziesii*, *Calocedrus decurrens*, *Notholithocarpus densiflorus*, *Pinus coulteri*, *Pinus lambertiana*, *Pinus monophylla*, *Pinus ponderosa*, *Pseudotsuga macrocarpa*, *Pseudotsuga menziesii*, *Quercus garryana* var. *garryana*, *Quercus kelloggii*, *Quercus wislizeni*, and *Umbellularia californica*.

*Quercus chrysolepis* grows on the east side of the Sierra Nevada, in the Mojave Desert, and in most of cismontane California at middle and upper elevations (Griffin and Critchfield 1972). *Quercus chrysolepis* is present in many different alliances and it shares dominance with several other tree species in this alliance (Allen-Diaz et al. 2007). Most *Quercus chrysolepis* stands that are free of recent major disturbance have trees of all sizes and all ages (Tirmenstein 1989b, Thornburgh 1990b).

Sonoma County

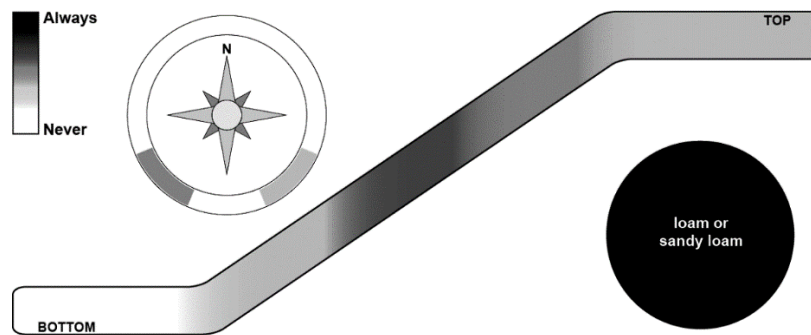
This alliance is best represented in the interior portions of the county, typically at least seven miles from the coast.

**Local Alliance Summary (n = 5)**

**Elevation:** 1114–3839 ft, mean 2270 ft

**SCV Global/State Rank:** G5/S5<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 61.6         | 49–70         | –          |
| <b>Herb</b>             | 4.8          | 0–11          | <0.5–0.5   |
| <b>Shrub</b>            | 17.0         | 0.2–31        | 1–5        |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 3.4          | 0–9           | 2–5        |
| Hardwood                      | 44.2         | 30–55         | 2–15       |
| Conifer                       | 2.4          | 0–4           | 2–15       |

\*Includes seedlings and saplings

Summary of Environmental Data

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 27.8° | 10–38° |
| Large rock cover  | 4.3%  | 0–17%  |
| Small rock cover  | 2.3%  | 0–5%   |
| Bare ground cover | 16.1% | 0–60%  |
| Litter cover      | 75.5% | 34–98% |

Associations within this Alliance:

*Quercus chrysolepis* – *Arbutus menziesii* Provisional Association

*Quercus chrysolepis* – *Quercus wislizeni* Association

**STAND TABLE**

***Quercus chrysolepis* (tree) Alliance**

n = 5

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                        | 100 | 34.4 | 17.0 | 48.0 |
|  | ARME   | * <i>Arbutus menziesii</i>                          | 80  | 6.3  | 0.2  | 11.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 80  | 5.5  | 1.0  | 10.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 80  | 3.0  | 2.0  | 4.0  |
|  | QUWI2  | * <i>Quercus wislizeni</i>                          | 20  | 4.0  | 4.0  | 4.0  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>               | 20  | 2.0  | 2.0  | 2.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 20  | 2.0  | 2.0  | 2.0  |
|  | ACMA3  | <i>Acer macrophyllum</i>                            | 20  | 0.2  | 0.2  | 0.2  |
|  | PIAT   | <i>Pinus attenuata</i>                              | 20  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 60  | 4.1  | 3.0  | 6.2  |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 40  | 0.4  | 0.4  | 0.4  |
|  | ARME   | * <i>Arbutus menziesii</i>                          | 20  | 0.4  | 0.4  | 0.4  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>               | 20  | 0.4  | 0.4  | 0.4  |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                        | 20  | 0.4  | 0.4  | 0.4  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 60  | 10.4 | 0.2  | 26.0 |
|  | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i>   | 40  | 9.1  | 0.2  | 18.0 |
|  | FRCA12 | <i>Frangula californica</i>                         | 40  | 4.1  | 0.2  | 8.0  |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 40  | 4.0  | 1.0  | 7.0  |
|  | LOSC2  | <i>Lotus scoparius</i>                              | 40  | 3.1  | 0.2  | 6.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 40  | 2.1  | 0.2  | 4.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 40  | 0.2  | 0.2  | 0.2  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 40  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus chrysolepis* (tree) Alliance**

n = 5

| Lifeform            | Code   | Botanical Name                                    | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Shrub</b>        |        |   |     |      |      |      |
|                     | QUWIF  | * <i>Quercus wislizeni</i> var. <i>frutescens</i> | 20  | 12.0 | 12.0 | 12.0 |
|                     | ADFA   | <i>Adenostoma fasciculatum</i>                    | 20  | 6.0  | 6.0  | 6.0  |
|                     | GAFR   | <i>Garrya fremontii</i>                           | 20  | 2.0  | 2.0  | 2.0  |
|                     | ARST   | <i>Arctostaphylos stanfordiana</i>                | 20  | 1.0  | 1.0  | 1.0  |
|                     | ARCA5  | <i>Arctostaphylos canescens</i>                   | 20  | 0.2  | 0.2  | 0.2  |
|                     | CEFO   | <i>Ceanothus foliosus</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|                     | GARRY  | <i>Garrya</i>                                     | 20  | 0.2  | 0.2  | 0.2  |
|                     | HODI   | <i>Holodiscus discolor</i>                        | 20  | 0.2  | 0.2  | 0.2  |
|                     | LONIC  | <i>Lonicera</i>                                   | 20  | 0.2  | 0.2  | 0.2  |
|                     | LOHI2  | <i>Lonicera hispidula</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|                     | TODI   | <i>Toxicodendron diversilobum</i>                 | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 40  | 1.5  | 1.0  | 2.0  |
|                     | IRIS   | <i>Iris</i>                                       | 40  | 0.6  | 0.2  | 1.0  |
|                     | POCA5  | <i>Polygala californica</i>                       | 40  | 0.2  | 0.2  | 0.2  |
|                     | BRHO2  | <i>Bromus hordeaceus</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|                     | BRMA   | <i>Briza maxima</i>                               | 20  | 1.0  | 1.0  | 1.0  |
|                     | CYEC   | <i>Cynosurus echinatus</i>                        | 20  | 1.0  | 1.0  | 1.0  |
|                     | PETR7  | <i>Pentagramma triangularis</i>                   | 20  | 1.0  | 1.0  | 1.0  |
|                     | POGL8  | <i>Polypodium glycyrrhiza</i>                     | 20  | 1.0  | 1.0  | 1.0  |
|                     | AICA   | <i>Aira caryophyllea</i>                          | 20  | 0.2  | 0.2  | 0.2  |
|                     | ASCA5  | <i>Aspidotis californica</i>                      | 20  | 0.2  | 0.2  | 0.2  |
|                     | CALOC  | <i>Calochortus</i>                                | 20  | 0.2  | 0.2  | 0.2  |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i>                   | 20  | 0.2  | 0.2  | 0.2  |
|                     | FECA   | <i>Festuca californica</i>                        | 20  | 0.2  | 0.2  | 0.2  |
|                     | GALIU  | <i>Galium</i>                                     | 20  | 0.2  | 0.2  | 0.2  |
|                     | TOAR   | <i>Torilis arvensis</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|                     | WHMO   | <i>Whipplea modesta</i>                           | 20  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2MOSS  | Moss  | 40  | 7.6  | 0.2  | 15.0 |
|                     | 2LICHN | Lichen  | 40  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus chrysolepis* – *Arbutus menziesii* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 58.3         | 49–64         | –          |
| Herb             | 7.3          | 5–11          | <0.5–0.5   |



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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Shrub                         | 13.7         | 0.2–31        | 1–2        |
| Regenerating/understory tree* | 5.7          | 3–9           | 2–5        |
| Hardwood                      | 41.0         | 30–55         | 2–15       |
| Conifer                       | 3.3          | 3–4           | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (2), variable (1)

**Macrotopography:** lower to middle 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (1), flat (1), undulating (1)

**Parent material:** Franciscan melange (1), sandstone (2)

**Soil texture:** no data (3)

**Slope steepness:** steep/>25° (3)

|                   | Mean     | Range         |
|-------------------|----------|---------------|
| Elevation         | 1459 ft. | 1114–1761 ft. |
| Slope             | 33.7°    | 31–38°        |
| Large rock cover  | 5.7%     | 0–17%         |
| Small rock cover  | 3.1%     | 0–5%          |
| Bare ground cover | 21.4%    | 0–60%         |
| Litter cover      | 68.0%    | 34–94%        |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0901, SONO0908, SONO0944

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus chrysolepis* – *Arbutus menziesii* Provisional Association**

n = 3

| Lifeform                        | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|---------------------------------|-------|---------------------------------------|-----|------|------|------|
| Tree                            |       |                                       |     |      |      |      |
|                                 | QUCH2 | * <i>Quercus chrysolepis</i>          | 100 | 28.0 | 17.0 | 44.0 |
|                                 | ARME  | * <i>Arbutus menziesii</i>            | 100 | 8.3  | 7.0  | 11.0 |
|                                 | PSME  | * <i>Pseudotsuga menziesii</i>        | 100 | 3.3  | 3.0  | 4.0  |
|                                 | UMCA  | * <i>Umbellularia californica</i>     | 67  | 5.5  | 4.0  | 7.0  |
|                                 | QUWI2 | <i>Quercus wislizeni</i>              | 33  | 4.0  | 4.0  | 4.0  |
|                                 | NODE3 | * <i>Notholithocarpus densiflorus</i> | 33  | 2.0  | 2.0  | 2.0  |
|                                 | QUAG  | * <i>Quercus agrifolia</i>            | 33  | 2.0  | 2.0  | 2.0  |
|                                 | ACMA3 | <i>Acer macrophyllum</i>              | 33  | 0.2  | 0.2  | 0.2  |
| Regenerating or Understory Tree |       |                                       |     |      |      |      |
|                                 | PSME  | * <i>Pseudotsuga menziesii</i>        | 100 | 4.1  | 3.0  | 6.2  |
|                                 | UMCA  | * <i>Umbellularia californica</i>     | 67  | 0.4  | 0.4  | 0.4  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Quercus chrysolepis* – *Arbutus menziesii* Provisional Association**

n = 3

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>               | 33  | 0.4  | 0.4 | 0.4  |
|  | ARME   | * <i>Arbutus menziesii</i>                          | 33  | 0.4  | 0.4 | 0.4  |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                        | 33  | 0.4  | 0.4 | 0.4  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 33  | 0.2  | 0.2 | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 67  | 13.1 | 0.2 | 26.0 |
|  | LOSC2  | <i>Lotus scoparius</i>                              | 67  | 3.1  | 0.2 | 6.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 67  | 2.1  | 0.2 | 4.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 67  | 0.2  | 0.2 | 0.2  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 67  | 0.2  | 0.2 | 0.2  |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 33  | 6.0  | 6.0 | 6.0  |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 33  | 1.0  | 1.0 | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 33  | 0.2  | 0.2 | 0.2  |
|  | LOHI2  | <i>Lonicera hispidula</i>                           | 33  | 0.2  | 0.2 | 0.2  |
|  | LONIC  | <i>Lonicera</i>                                     | 33  | 0.2  | 0.2 | 0.2  |
|  | HODI   | <i>Holodiscus discolor</i>                          | 33  | 0.2  | 0.2 | 0.2  |
|  | GARRY  | <i>Garrya</i>                                       | 33  | 0.2  | 0.2 | 0.2  |
|  | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i>   | 33  | 0.2  | 0.2 | 0.2  |
|  | FRCA12 | <i>Frangula californica</i>                         | 33  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 67  | 1.5  | 1.0 | 2.0  |
|  | IRIS   | <i>Iris</i>   | 67  | 0.6  | 0.2 | 1.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 33  | 3.0  | 3.0 | 3.0  |
|  | PETR7  | <i>Pentagramma triangularis</i>                     | 33  | 1.0  | 1.0 | 1.0  |
|  | POGL8  | <i>Polypodium glycyrrhiza</i>                       | 33  | 1.0  | 1.0 | 1.0  |
|  | BRMA   | <i>Briza maxima</i>                                 | 33  | 1.0  | 1.0 | 1.0  |
|  | CYEC   | <i>Cynosurus echinatus</i>                          | 33  | 1.0  | 1.0 | 1.0  |
|  | WHMO   | <i>Whipplea modesta</i>                             | 33  | 0.2  | 0.2 | 0.2  |
|  | ASCA5  | <i>Aspidotis californica</i>                        | 33  | 0.2  | 0.2 | 0.2  |
|  | CALOC  | <i>Calochortus</i>                                  | 33  | 0.2  | 0.2 | 0.2  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                     | 33  | 0.2  | 0.2 | 0.2  |
|  | FECA   | <i>Festuca californica</i>                          | 33  | 0.2  | 0.2 | 0.2  |
|  | GALIU  | <i>Galium</i>                                       | 33  | 0.2  | 0.2 | 0.2  |
|  | POCA5  | <i>Polygala californica</i>                         | 33  | 0.2  | 0.2 | 0.2  |
|  | TOAR   | <i>Torilis arvensis</i>                             | 33  | 0.2  | 0.2 | 0.2  |
|  | AICA   | <i>Aira caryophyllea</i>                            | 33  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |     |      |
|  | 2MOSS  | Moss  | 67  | 7.6  | 0.2 | 15.0 |
|  | 2LICHN | Lichen  | 67  | 0.2  | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus chrysolepis* – *Quercus wislizeni* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 63.0         | 63            | –          |
| Herb                          | 2.0          | 2             | <0.5–0.5   |
| Shrub                         | 19.0         | 19            | 2–5        |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 50.0         | 50            | 5–10       |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** no data (1)  
**Macrotopography:** middle 1/3 of slope (1)  
**Microtopography:** concave (1)  
**Parent material:** sedimentary (1)  
**Soil texture:** no data (1)  
**Elevation:** 3135 ft.

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0045  
**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus chrysolepis* – *Quercus wislizeni* Association**

n = 1

| Lifeform | Code  | Botanical Name                                  | Con | Avg  | Min  | Max  |
|----------|-------|---|-----|------|------|------|
| Tree     | QUCH2 | <i>Quercus chrysolepis</i>                      | 100 | 40.0 | 40.0 | 40.0 |
|          | UMCA  | <i>Umbellularia californica</i>                 | 100 | 10.0 | 10.0 | 10.0 |
|          | ARME  | <i>Arbutus menziesii</i>                        | 100 | 0.2  | 0.2  | 0.2  |
| Shrub    | QUWIF | <i>Quercus wislizeni</i> var. <i>frutescens</i> | 100 | 12.0 | 12.0 | 12.0 |
|          | CEMOG | <i>Cercocarpus montanus</i> var. <i>glaber</i>  | 100 | 7.0  | 7.0  | 7.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Quercus douglasii* Alliance**

### **Blue oak woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus douglasii* is dominant or co-dominant in the tree canopy with *Aesculus californica*, *Juniperus californica*, *Pinus sabiniana*, *Quercus agrifolia*, *Quercus lobata*, and *Quercus wislizeni*.

The *Quercus douglasii* Alliance, in its varied forms, is one of the most extensive and conspicuous vegetation types in the state. In some cases, oak savannas of *Quercus douglasii* trees are scattered across the landscape, and in other cases, trees of mixed composition form a closed tree canopy. Genetic variation is high in the species. Environmental factors controlling this variation include moisture availability, substrate, fire, and other disturbances (Allen-Diaz and Bartolome 1992, Allen-Diaz et al. 2007, Keeley 2002c). Named *Quercus douglasii* hybrids include those with *Q. john-tuckeri* (*Quercus* × *alvordiana*), *Q. garryana* (*Quercus* × *eplingii*), and *Q. lobata* (*Quercus* × *jolonensis*) (Griffin and Critchfield 1972).

### Sonoma County

Stands of *Quercus douglasii* in Sonoma County are commonly composed of hybrids with *Q. garryana* (*Quercus* × *eplingii*), which are sometimes difficult to distinguish from either parent species. Most typical blue oak stands with blue-green foliage occur in the southeastern portion of the county. Those stands composed of many hybrid oaks and occupying relatively xeric inland sites have also been placed in this alliance.

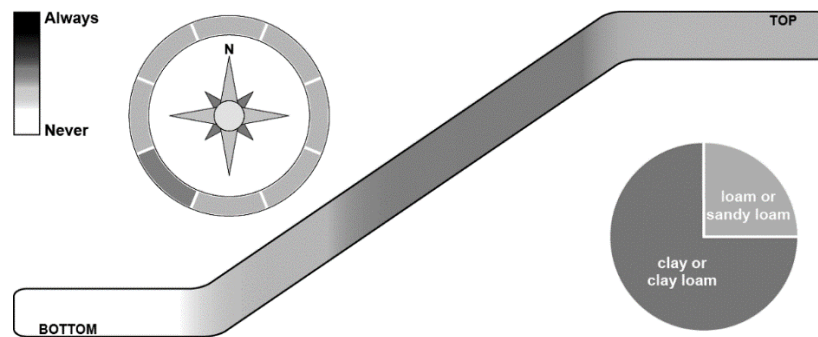
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### **Local Alliance Summary (n = 14)**

**Elevation:** 222–1942 ft, mean 871 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 62.4         | 25–95         | –          |
| Herb                          | 42.0         | 10–80         | <0.5–1     |
| Shrub                         | 8.4          | 0–41          | 1–5        |
| Regenerating/understory tree* | 1.5          | 0–5           | <0.5–15    |
| Hardwood                      | 25.9         | 10–45         | 2–20       |
| Conifer                       | 0.5          | 0–7           | 10–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 11.0° | 0–22°  |
| Large rock cover  | 5.3%  | 0–40%  |
| Small rock cover  | 2.6%  | 0–10%  |
| Bare ground cover | 15.8% | 1–51%  |
| Litter cover      | 74.2% | 12–96% |

**Associations within this Alliance:**

*Quercus ×eplingii* / Grass Provisional Association  
*Quercus douglasii* – *Quercus agrifolia* Association  
*Quercus douglasii* / *Arctostaphylos manzanita* / Herbaceous Association  
*Quercus douglasii* / Grass Association

**STAND TABLE**

***Quercus douglasii* Alliance**

n = 14

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QUDO  | * <i>Quercus douglasii</i>        | 100 | 19.3 | 0.2 | 33.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 57  | 3.0  | 0.2 | 9.0  |
|  | QUGA4 | <i>Quercus garryana</i>           | 43  | 6.4  | 0.2 | 15.0 |
|  | QUKE  | <i>Quercus kelloggii</i>          | 36  | 2.8  | 0.2 | 8.0  |
|  | UMCA  | * <i>Umbellularia californica</i> | 21  | 1.1  | 0.2 | 2.0  |
|  | ARME  | <i>Arbutus menziesii</i>          | 21  | 0.8  | 0.2 | 2.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | QUDO  | * <i>Quercus douglasii</i>        | 29  | 3.0  | 0.2 | 5.2  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 29  | 0.3  | 0.2 | 0.4  |
|  | UMCA  | * <i>Umbellularia californica</i> | 21  | 1.5  | 0.2 | 3.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 71  | 0.4  | 0.2 | 1.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 43  | 8.5  | 0.2 | 40.0 |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | AVBA  | <i>Avena barbata</i>              | 71  | 9.9  | 2.0 | 30.0 |
|  | BRDI3 | <i>Bromus diandrus</i>            | 64  | 8.7  | 0.2 | 30.0 |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 50  | 8.6  | 0.2 | 20.0 |
|  | CAPY2 | <i>Carduus pycnocephalus</i>      | 50  | 1.6  | 0.2 | 5.0  |
|  | ELGL  | <i>Elymus glaucus</i>             | 50  | 1.5  | 0.2 | 6.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus douglasii* Alliance**

n = 14

| Lifeform            | Code   | Botanical Name                  | Con | Avg  | Min | Max  |
|---------------------|--------|---------------------------------|-----|------|-----|------|
| <b>Herb</b>         |        |                                 |     |      |     |      |
|                     | BRMA   | <i>Briza maxima</i>             | 43  | 13.3 | 5.0 | 20.0 |
|                     | BRHO2  | <i>Bromus hordeaceus</i>        | 43  | 8.0  | 0.2 | 20.0 |
|                     | TOAR   | <i>Torilis arvensis</i>         | 43  | 0.5  | 0.2 | 1.0  |
|                     | BRDI2  | <i>Brachypodium distachyon</i>  | 36  | 12.8 | 4.0 | 20.0 |
|                     | TRHI4  | <i>Trifolium hirtum</i>         | 36  | 5.0  | 2.0 | 10.0 |
|                     | MELIC  | <i>Melica</i>                   | 29  | 0.4  | 0.2 | 1.0  |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i> | 29  | 0.2  | 0.2 | 0.2  |
|                     | NAPU4  | <i>Nassella pulchra</i>         | 21  | 0.5  | 0.2 | 1.0  |
|                     | ACMI2  | <i>Achillea millefolium</i>     | 21  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b> |        |                                 |     |      |     |      |
|                     | 2MOSS  | Moss                            | 57  | 2.3  | 0.2 | 12.0 |
|                     | 2LICHN | Lichen                          | 43  | 2.1  | 0.2 | 8.0  |

***Quercus xepingii* / Grass Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.5         | 25–80         | –          |
| <b>Herb</b>                          | 23.8         | 10–40         | <0.5–1     |
| <b>Shrub</b>                         | 10.1         | 0.2–30        | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 30.3         | 15–45         | 5–20       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (1), SW (1)

**Macrotopography:** middle 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (2)

**Microtopography:** convex (3), flat (1)

**Parent material:** Franciscan melange (1), metasedimentary (1), volcanic (2)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (3)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1306 ft. | 428–1909 ft. |
| <b>Slope</b>             | 16.3°    | 4–22°        |
| <b>Large rock cover</b>  | 1.6%     | 0–2%         |
| <b>Small rock cover</b>  | 2.4%     | 0–5%         |
| <b>Bare ground cover</b> | 6.3%     | 2–16%        |
| <b>Litter cover</b>      | 87.3%    | 80–92%       |

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**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** MILOB022, SONO0017, SONO0836

**Relevés:** SONO0013

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Quercus xepplingii* / Grass Provisional Association**

n = 4

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                                   | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>                            |             |   |            |            |            |            |
|  | QUDO        | <i>Quercus douglasii</i>                                | 100        | 13.8       | 0.2        | 30.0       |
|  | QUGA4       | * <i>Quercus garryana</i>                               | 100        | 9.3        | 4.0        | 15.0       |
|  | QUKE        | <i>Quercus kelloggii</i>                                | 50         | 6.0        | 4.0        | 8.0        |
|  | QUEP        | <i>Quercus xepplingii</i>                               | 50         | 5.5        | 3.0        | 8.0        |
|  | QUCH2       | <i>Quercus chrysolepis</i>                              | 25         | 2.0        | 2.0        | 2.0        |
|  | ARME        | <i>Arbutus menziesii</i>                                | 25         | 2.0        | 2.0        | 2.0        |
|  | UMCA        | * <i>Umbellularia californica</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|  | AECA        | <i>Aesculus californica</i>                             | 25         | 0.2        | 0.2        | 0.2        |
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | PSME        | <i>Pseudotsuga menziesii</i>                            | 25         | 1.0        | 1.0        | 1.0        |
|  | QUGA4       | * <i>Quercus garryana</i>                               | 25         | 0.4        | 0.4        | 0.4        |
|  | UMCA        | * <i>Umbellularia californica</i>                       | 25         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i>                       | 75         | 0.5        | 0.2        | 1.0        |
|  | ARMAM2      | * <i>Arctostaphylos manzanita</i> ssp. <i>manzanita</i> | 25         | 30.0       | 30.0       | 30.0       |
|  | ARMA        | * <i>Arctostaphylos manzanita</i>                       | 25         | 1.0        | 1.0        | 1.0        |
|  | LOHI2       | <i>Lonicera hispidula</i>                               | 25         | 1.0        | 1.0        | 1.0        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | ELGL        | <i>Elymus glaucus</i>                                   | 100        | 1.9        | 0.2        | 6.0        |
|  | BRDI2       | <i>Brachypodium distachyon</i>                          | 75         | 9.7        | 4.0        | 15.0       |
|  | AVBA        | <i>Avena barbata</i>                                    | 75         | 2.7        | 2.0        | 4.0        |
|  | BRDI3       | <i>Bromus diandrus</i>                                  | 75         | 2.4        | 0.2        | 5.0        |
|  | MELIC       | <i>Melica</i>   | 75         | 0.2        | 0.2        | 0.2        |
|  | CYEC        | <i>Cynosurus echinatus</i>                              | 50         | 6.5        | 3.0        | 10.0       |
|  | BRHO2       | <i>Bromus hordeaceus</i>                                | 50         | 1.6        | 0.2        | 3.0        |
|  | SACR2       | <i>Sanicula crassicaulis</i>                            | 50         | 1.1        | 0.2        | 2.0        |
|  | RAOC        | <i>Ranunculus occidentalis</i>                          | 50         | 0.6        | 0.2        | 1.0        |
|  | TOAR        | <i>Torilis arvensis</i>                                 | 50         | 0.6        | 0.2        | 1.0        |
|  | GACAC       | <i>Galium californicum</i> ssp. <i>californicum</i>     | 50         | 0.2        | 0.2        | 0.2        |
|  | ACMI2       | <i>Achillea millefolium</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|  | CHPO3       | <i>Chlorogalum pomeridianum</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | LOTE2       | <i>Lolium temulentum</i>                                | 25         | 4.0        | 4.0        | 4.0        |
|  | CYNOS2      | <i>Cynosurus</i>  | 25         | 2.0        | 2.0        | 2.0        |
|  | FECA        | <i>Festuca californica</i>                              | 25         | 2.0        | 2.0        | 2.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus xepplingii* / Grass Provisional Association**

n = 4

| Lifeform            | Code   | Botanical Name               | Con | Avg | Min | Max |
|---------------------|--------|------------------------------|-----|-----|-----|-----|
| Herb                | BRCA5  | <i>Bromus carinatus</i>      | 25  | 1.0 | 1.0 | 1.0 |
|                     | GAAP2  | <i>Galium aparine</i>        | 25  | 1.0 | 1.0 | 1.0 |
|                     | LUCO6  | <i>Luzula comosa</i>         | 25  | 1.0 | 1.0 | 1.0 |
|                     | METO   | <i>Melica torreyana</i>      | 25  | 1.0 | 1.0 | 1.0 |
|                     | TORIL  | <i>Torilis</i>               | 25  | 1.0 | 1.0 | 1.0 |
|                     | VISA   | <i>Vicia sativa</i>          | 25  | 1.0 | 1.0 | 1.0 |
|                     | GAPO   | <i>Galium porrigens</i>      | 25  | 0.2 | 0.2 | 0.2 |
|                     | CAPY2  | <i>Carduus pycnocephalus</i> | 25  | 0.2 | 0.2 | 0.2 |
|                     | VICIA  | <i>Vicia</i>                 | 25  | 0.2 | 0.2 | 0.2 |
|                     | LOTUS  | <i>Lotus</i>                 | 25  | 0.2 | 0.2 | 0.2 |
|                     | MAGR3  | <i>Madia gracilis</i>        | 25  | 0.2 | 0.2 | 0.2 |
|                     | PEMU   | <i>Pellaea mucronata</i>     | 25  | 0.2 | 0.2 | 0.2 |
|                     | PEGA3  | <i>Perideridia gairdneri</i> | 25  | 0.2 | 0.2 | 0.2 |
|                     | PEDU2  | <i>Petrorhagia dubia</i>     | 25  | 0.2 | 0.2 | 0.2 |
|                     | LACA   | <i>Lactuca canadensis</i>    | 25  | 0.2 | 0.2 | 0.2 |
|                     | STACH  | <i>Stachys</i>               | 25  | 0.2 | 0.2 | 0.2 |
|                     | TRBA   | <i>Trifolium barbigerum</i>  | 25  | 0.2 | 0.2 | 0.2 |
|                     | TRLA16 | <i>Triteleia laxa</i>        | 25  | 0.2 | 0.2 | 0.2 |
|                     | CLARK  | <i>Clarkia</i>               | 25  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                              |     |     |     |     |
|                     | 2MOSS  | Moss                         | 50  | 0.6 | 0.2 | 1.0 |
|                     | 2LICHN | Lichen                       | 25  | 0.2 | 0.2 | 0.2 |

***Quercus douglasii* – *Quercus agrifolia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 59.0         | 53–65         | –          |
| <b>Herb</b>                          | 40.0         | 40–40         | <0.5–0.5   |
| <b>Shrub</b>                         | 6.5          | 3–10          | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.6          | 0.2–5         | 1–5        |
| <b>Hardwood</b>                      | 14.0         | 10–18         | 5–10       |
| <b>Conifer</b>                       | 3.6          | 0–7           | 10–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** Flat (1), SE (1)

**Macrotopography:** lower 1/3 of slope (1)

**Microtopography:** flat (1)

**Parent material:** rhyolite (1), volcanic (1)

**Soil texture:** no data (2)

**Slope steepness:** flat/0° (1), moderate/6-25° (1)



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 645 ft. | 555–734 ft. |
| Slope             | 5.0°    | 0–10°       |
| Large rock cover  | 20.2%   | 0–40%       |
| Small rock cover  | 1.1%    | 0–2%        |
| Bare ground cover | 32.5%   | 20–45%      |
| Litter cover      | 44.5%   | 12–77%      |

**Samples Used to Describe Association (n=2)**  
**Rapid Assessments:** SONO0609, SONO0853  
**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus douglasii* – *Quercus agrifolia* Association**

n = 2

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Tree</b>                            |        |   |     |      |     |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 100 | 7.0  | 5.0 | 9.0  |
|  | QUDO   | * <i>Quercus douglasii</i>                          | 100 | 7.0  | 5.0 | 9.0  |
|  | PISA2  | * <i>Pinus sabiniana</i>                            | 50  | 7.0  | 7.0 | 7.0  |
|  | QUKE   | <i>Quercus kelloggii</i>                            | 50  | 0.2  | 0.2 | 0.2  |
|  | ARME   | <i>Arbutus menziesii</i>                            | 50  | 0.2  | 0.2 | 0.2  |
|  | PIPO   | <i>Pinus ponderosa</i>                              | 50  | 0.2  | 0.2 | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | PISA2  | * <i>Pinus sabiniana</i>                            | 50  | 3.0  | 3.0 | 3.0  |
|  | QUDO   | * <i>Quercus douglasii</i>                          | 50  | 1.2  | 1.2 | 1.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 50  | 0.4  | 0.4 | 0.4  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 50  | 0.2  | 0.2 | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 100 | 4.0  | 3.0 | 5.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 100 | 0.2  | 0.2 | 0.2  |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 50  | 4.0  | 4.0 | 4.0  |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 50  | 0.2  | 0.2 | 0.2  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 50  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 100 | 11.5 | 3.0 | 20.0 |
|  | BRMA   | <i>Briza maxima</i>                                 | 100 | 9.0  | 5.0 | 13.0 |
|  | TRHI4  | <i>Trifolium hirtum</i>                             | 100 | 6.0  | 2.0 | 10.0 |
|  | TACA8  | <i>Taeniatherum caput-medusae</i>                   | 100 | 4.6  | 0.2 | 9.0  |
|  | AVBA   | <i>Avena barbata</i>                                | 100 | 4.0  | 3.0 | 5.0  |
|  | CRSE11 | <i>Croton setigerus</i>                             | 100 | 0.2  | 0.2 | 0.2  |
|  | CYEC   | <i>Cynosurus echinatus</i>                          | 50  | 2.0  | 2.0 | 2.0  |
|  | SELAG  | <i>Selaginella</i>                                  | 50  | 1.0  | 1.0 | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus douglasii* – *Quercus agrifolia* Association**

n = 2

| Lifeform     | Code   | Botanical Name                | Con | Avg  | Min  | Max  |
|--------------|--------|-------------------------------|-----|------|------|------|
| Herb         |        |                               |     |      |      |      |
|              | TOAR   | <i>Torilis arvensis</i>       | 50  | 0.2  | 0.2  | 0.2  |
|              | GAPO   | <i>Galium porrigens</i>       | 50  | 0.2  | 0.2  | 0.2  |
|              | FECA   | <i>Festuca californica</i>    | 50  | 0.2  | 0.2  | 0.2  |
|              | CESO3  | <i>Centaurea solstitialis</i> | 50  | 0.2  | 0.2  | 0.2  |
| Non-vascular |        |                               |     |      |      |      |
|              | 2MOSS  | Moss                          | 50  | 12.0 | 12.0 | 12.0 |
|              | 2LICHN | Lichen                        | 50  | 8.0  | 8.0  | 8.0  |

***Quercus douglasii* / *Arctostaphylos manzanita* / Herbaceous Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 50–80         | –          |
| <b>Herb</b>                          | 32.0         | 18–46         | <0.5–1     |
| <b>Shrub</b>                         | 30.5         | 20–41         | 2–5        |
| <b>Regenerating/understory tree*</b> | 2.5          | 0–5           | 2–5        |
| <b>Hardwood</b>                      | 24.0         | 15–33         | 2–15       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (2)

**Macrotopography:** lower 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** convex (2)

**Parent material:** igneous (1), mixed alluvium (1)

**Soil texture:** no data (2)

**Slope steepness:** moderate/6-25° (2)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 702 ft. | 243–1161 ft. |
| <b>Slope</b>             | 9.5°    | 7–12°        |
| <b>Large rock cover</b>  | 0.2%    | 0–0.4%       |
| <b>Small rock cover</b>  | 2.1%    | 1–3%         |
| <b>Bare ground cover</b> | 20.5%   | 3–38%        |
| <b>Litter cover</b>      | 76.0%   | 60–92%       |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0638, SONO0820

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE**

***Quercus douglasii* / *Arctostaphylos manzanita* / Herbaceous Association**

n = 2

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUDO   | * <i>Quercus douglasii</i>                              | 100 | 22.5 | 15.0 | 30.0 |
|  | QUKE   | <i>Quercus kelloggii</i>                                | 50  | 1.0  | 1.0  | 1.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                              | 50  | 1.0  | 1.0  | 1.0  |
|  | QUGA4  | <i>Quercus garryana</i>                                 | 50  | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUDO   | * <i>Quercus douglasii</i>                              | 50  | 5.2  | 5.2  | 5.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>                              | 50  | 0.4  | 0.4  | 0.4  |
|  | PIPO   | <i>Pinus ponderosa</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                          | 100 | 1.1  | 0.2  | 2.0  |
|  | ARMA   | * <i>Arctostaphylos manzanita</i>                       | 50  | 40.0 | 40.0 | 40.0 |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>          | 50  | 10.0 | 10.0 | 10.0 |
|  | ARMAM2 | * <i>Arctostaphylos manzanita</i> ssp. <i>manzanita</i> | 50  | 8.0  | 8.0  | 8.0  |
|  | RHCR   | <i>Rhamnus crocea</i>                                   | 50  | 1.0  | 1.0  | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|  | PHVI9  | <i>Phoradendron villosum</i>                            | 50  | 0.2  | 0.2  | 0.2  |
|  | LOHI2  | <i>Lonicera hispidula</i>                               | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | CYEC   | <i>Cynosurus echinatus</i>                              | 100 | 7.6  | 0.2  | 15.0 |
|  | BRDI2  | <i>Brachypodium distachyon</i>                          | 50  | 15.0 | 15.0 | 15.0 |
|  | BRMA   | <i>Briza maxima</i>                                     | 50  | 15.0 | 15.0 | 15.0 |
|  | BRDI3  | <i>Bromus diandrus</i>                                  | 50  | 15.0 | 15.0 | 15.0 |
|  | BRHO2  | <i>Bromus hordeaceus</i>                                | 50  | 2.0  | 2.0  | 2.0  |
|  | AVENA  | <i>Avena</i>  | 50  | 1.0  | 1.0  | 1.0  |
|  | ACMI2  | <i>Achillea millefolium</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|  | WYGL   | <i>Wyethia glabra</i>                                   | 50  | 0.2  | 0.2  | 0.2  |
|  | TOAR   | <i>Torilis arvensis</i>                                 | 50  | 0.2  | 0.2  | 0.2  |
|  | IRMA   | <i>Iris macrosiphon</i>                                 | 50  | 0.2  | 0.2  | 0.2  |
|  | ELGL   | <i>Elymus glaucus</i>                                   | 50  | 0.2  | 0.2  | 0.2  |
|  | CAPY2  | <i>Carduus pycnocephalus</i>                            | 50  | 0.2  | 0.2  | 0.2  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                         | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2LICHN | Lichen  | 50  | 0.2  | 0.2  | 0.2  |
|  | 2MOSS  | Moss  | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus douglasii* / Grass Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (4) USDA Ecological Subsections (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.0         | 50–95         | –          |
| <b>Herb</b>                          | 58.2         | 40–80         | <0.5–1     |
| <b>Shrub</b>                         | 0.7          | 0–3           | 1–5        |
| <b>Regenerating/understory tree*</b> | 1.8          | 0.2–5         | 0–15       |
| <b>Hardwood</b>                      | 27.7         | 15–35         | 5–15       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (3), variable (3)

**Macrotopography:** lower 1/3 of slope (1), lower to middle 1/3 of slope (1), middle 1/3 of slope (2), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (3), flat (1), undulating (2)

**Parent material:** Franciscan melange (1), rhyolite (1), sandstone (1), volcanic (3)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6-25° (5)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 714 ft. | 222–1942 ft. |
| <b>Slope</b>             | 9.5°    | 8–10°        |
| <b>Large rock cover</b>  | 4.6%    | 0–12%        |
| <b>Small rock cover</b>  | 3.3%    | 0–10%        |
| <b>Bare ground cover</b> | 15.0%   | 1–51%        |
| <b>Litter cover</b>      | 74.8%   | 40–96%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0076, SONO0177, SONO0215, SONO0217, SONO0608, SONO0635

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus douglasii* / Grass Association**

n = 6

| Lifeform                               | Code | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |      |                                   |     |      |      |      |
|  | QUDO | * <i>Quercus douglasii</i>        | 100 | 26.0 | 10.0 | 33.0 |
|  | QUAG | * <i>Quercus agrifolia</i>        | 83  | 1.7  | 0.2  | 5.0  |
|  | UMCA | * <i>Umbellularia californica</i> | 33  | 1.5  | 1.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> |      |                                   |     |      |      |      |
|  | QUDO | * <i>Quercus douglasii</i>        | 33  | 2.7  | 0.2  | 5.2  |
|  | UMCA | * <i>Umbellularia californica</i> | 33  | 2.2  | 1.2  | 3.2  |
|  | ARME | <i>Arbutus menziesii</i>          | 33  | 0.3  | 0.2  | 0.4  |
|  | QUAG | * <i>Quercus agrifolia</i>        | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Quercus douglasii* / Grass Association**

n = 6

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Shrub</b>        | TODI        | <i>Toxicodendron diversilobum</i> | 67         | 0.4        | 0.2        | 1.0        |
|                     | ARMA        | <i>Arctostaphylos manzanita</i>   | 33         | 1.1        | 0.2        | 2.0        |
| <b>Herb</b>         | AVBA        | <i>Avena barbata</i>              | 83         | 16.6       | 8.0        | 30.0       |
|                     | BRDI3       | <i>Bromus diandrus</i>            | 83         | 11.2       | 0.2        | 30.0       |
|                     | CAPY2       | <i>Carduus pycnocephalus</i>      | 83         | 2.2        | 1.0        | 5.0        |
|                     | BRMA        | <i>Briza maxima</i>               | 50         | 15.7       | 12.0       | 20.0       |
|                     | TRHI4       | <i>Trifolium hirtum</i>           | 50         | 4.3        | 3.0        | 6.0        |
|                     | NAPU4       | <i>Nassella pulchra</i>           | 50         | 0.5        | 0.2        | 1.0        |
|                     | CYEC        | <i>Cynosurus echinatus</i>        | 33         | 15.0       | 10.0       | 20.0       |
|                     | ELGL        | <i>Elymus glaucus</i>             | 33         | 1.5        | 1.0        | 2.0        |
|                     | TOAR        | <i>Torilis arvensis</i>           | 33         | 0.6        | 0.2        | 1.0        |
| <b>Non-vascular</b> | 2MOSS       | Moss                              | 67         | 1.3        | 0.2        | 3.0        |
|                     | 2LICHN      | Lichen                            | 50         | 1.3        | 1.0        | 2.0        |

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## ***Quercus garryana* (tree) Alliance**

### **Oregon white oak woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus garryana* var. *garryana* is dominant or co-dominant in the tree canopy with *Juniperus occidentalis*, *Pinus jeffreyi*, *Pinus ponderosa*, *Pinus sabiniana*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Quercus kelloggii*, and *Umbellularia californica*.

Both forest and woodland *Quercus garryana* stands contain the tree form of the species (var. *garryana*). Trees grow on a wide variety of sites, and can be over-topped by conifers on productive sites. Stands typically occupy unproductive, exposed, dry, or temporarily wet locations (Griffin 1977, Howard 1992], Stein 1980a). They occur primarily in northwestern California, which has higher rainfall than other locations with oaks in the state (Jimerson and). Both native and non-native grasses make up the understory on most sites (Sawyer 2006). The shrub form of *Quercus garryana* (var. *fruticosa*) is treated in a separate alliance.

#### Sonoma County

Stands in Sonoma County may be partially composed of hybrids between *Quercus garryana* and *Quercus douglasii* (Q. ×eplingii). Stands containing hybrids with leaf and ecological characteristics similar to *Quercus garryana* are common in the vicinity of Lake Sonoma and elsewhere inland; they are classified here as members of the *Quercus garryana* Alliance.

Stands of *Quercus garryana* have been altered by a long history of changes in fire regimes. Native Americans maintained open *Quercus garryana* stands through frequent burning. After European settlement and the elimination of Native American burning, *Pseudotsuga menziesii* began to encroach upon *Quercus garryana* woodlands. The European settlement also introduced non-native herbs, which dry earlier than native herbs, changing the fuel load and species composition of *Quercus garryana* stands (Gucker 2007). Based on this history and the data from this project, the Q. *garryana* Alliance in Sonoma County is broken into two associations.

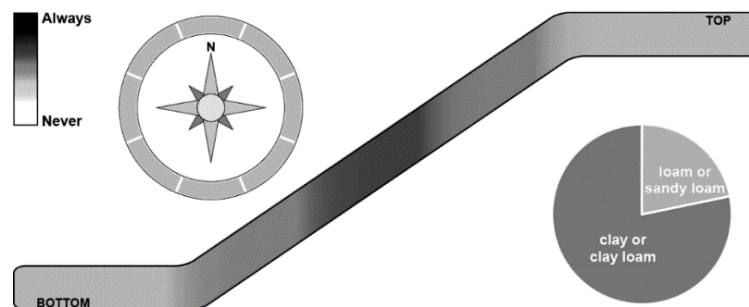
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#### **Local Alliance Summary (n = 49)**

**Elevation:** 254–1977 ft, mean 848 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 54.9         | 25–85         | –          |
| <b>Herb</b>                          | 25.7         | 1–75          | <0.5–2     |
| <b>Shrub</b>                         | 4.8          | 0–46          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 4.5          | 0–30          | <0.5–15    |
| <b>Hardwood</b>                      | 33.1         | 5–70          | 2–20       |
| <b>Conifer</b>                       | 1.8          | 0–19          | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 18.1° | 3–38° |
| <b>Large rock cover</b>  | 2.4%  | 0–30% |
| <b>Small rock cover</b>  | 5.5%  | 0–23% |
| <b>Bare ground cover</b> | 15.9% | 0–61% |
| <b>Litter cover</b>      | 70.7% | 0–97% |

**Associations within this Alliance:**

*Quercus garryana* – *Umbellularia californica* – *Quercus (agrifolia, kelloggii)* Provisional Association

*Quercus garryana* / (*Cynosurus echinatus* – *Festuca californica*) Provisional Association

**STAND TABLE**

***Quercus garryana* (tree) Alliance**

n = 49

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QUGA4 | * <i>Quercus garryana</i>         | 100 | 25.4 | 0.2 | 57.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 65  | 6.4  | 0.2 | 40.0 |
|  | QUKE  | <i>Quercus kelloggii</i>          | 55  | 4.6  | 0.2 | 15.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 51  | 3.4  | 0.2 | 30.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 37  | 3.7  | 0.2 | 16.0 |
|  | AECA  | <i>Aesculus californica</i>       | 27  | 2.2  | 0.2 | 7.0  |
|  | ARME  | * <i>Arbutus menziesii</i>        | 24  | 1.2  | 0.2 | 4.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 67  | 2.0  | 0.1 | 15.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 65  | 2.7  | 0.2 | 25.0 |
|  | QUGA4 | * <i>Quercus garryana</i>         | 57  | 1.4  | 0.1 | 10.2 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 37  | 0.2  | 0.2 | 1.0  |
|  | ARME  | * <i>Arbutus menziesii</i>        | 22  | 0.9  | 0.2 | 4.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 80  | 1.6  | 0.2 | 6.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 37  | 1.4  | 0.2 | 5.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 29  | 6.5  | 0.2 | 45.0 |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 67  | 8.1  | 0.2 | 30.0 |
|  | BRMA  | <i>Briza maxima</i>               | 59  | 11.2 | 0.2 | 70.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus garryana* (tree) Alliance**

n = 49

| Lifeform            | Code  | Botanical Name                  | Con | Avg  | Min | Max  |
|---------------------|-------|---------------------------------|-----|------|-----|------|
| <b>Herb</b>         |       |                                 |     |      |     |      |
|                     | FECA  | <i>Festuca californica</i>      | 51  | 10.0 | 0.2 | 56.0 |
|                     | ELGL  | <i>Elymus glaucus</i>           | 49  | 1.0  | 0.2 | 7.0  |
|                     | TOAR  | <i>Torilis arvensis</i>         | 49  | 0.7  | 0.2 | 4.0  |
|                     | CHPO3 | <i>Chlorogalum pomeridianum</i> | 39  | 1.1  | 0.2 | 6.0  |
|                     | PETR7 | <i>Pentagramma triangularis</i> | 27  | 0.4  | 0.2 | 3.0  |
|                     | IRIS  | <i>Iris</i>                     | 24  | 0.4  | 0.2 | 3.0  |
| <b>Non-vascular</b> |       |                                 |     |      |     |      |
|                     | 2MOSS | Moss                            | 73  | 2.7  | 0.2 | 23.0 |

***Quercus garryana* – *Umbellularia californica* – *Quercus (agrifolia, kelloggii)*  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2), Coastal Franciscan/263Ag (16), and Mount St. Helena Flows and Valleys/263Am (9) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 50.1         | 25–75         | –          |
| <b>Herb</b>                          | 12.7         | 1–30          | <0.5–2     |
| <b>Shrub</b>                         | 3.4          | 0–25          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 6.4          | 0–30          | <0.5–10    |
| <b>Hardwood</b>                      | 37.1         | 5–70          | 5–20       |
| <b>Conifer</b>                       | 2.3          | 0–16          | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (9), NW (11), SE (4), variable (2)

**Macrotopography:** bottom to lower 1/3 of slope (1), lower to middle 1/3 of slope (6), lower to upper 1/3 of slope (4), middle 1/3 of slope (7), middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (3), upper 1/3 of slope (5)

**Microtopography:** concave (1), convex (12), flat (2), undulating (11)

**Parent material:** Franciscan melange (8), greenstone (2), metasedimentary (2), mixed alluvium (1), sandstone (3), sedimentary (1), ultramafic (1), volcanic (9)

**Soil texture:** clay or clay loam (10), loam or sandy loam (4)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (16), steep/>25° (8)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 858 ft. | 294–1977 ft. |
| <b>Slope</b>             | 19.3°   | 3–38°        |
| <b>Large rock cover</b>  | 1.3%    | 0–10%        |
| <b>Small rock cover</b>  | 6.1%    | 0–23%        |
| <b>Bare ground cover</b> | 14.8%   | 0–45%        |
| <b>Litter cover</b>      | 75.7%   | 40–97%       |



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=27)**

**Rapid Assessments:** SONO0016, SONO0058, SONO0060, SONO0070, SONO0117, SONO0118, SONO0123, SONO0145, SONO0157, SONO0197, SONO0207, SONO0284, SONO0286, SONO0317, SONO0320, SONO0365, SONO0372, SONO0581, SONO0582, SONO0633, SONO0656, SONO0660, SONO0684, SONO0716, SONO0943, SONO0964, SONO0996

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Quercus garryana* – *Umbellularia californica* – *Quercus (agrifolia, kelloggii)* Provisional Association**

n = 27

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QUGA4 | * <i>Quercus garryana</i>         | 100 | 26.4 | 0.2 | 57.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 85  | 8.2  | 0.2 | 40.0 |
|  | QUKE  | <i>Quercus kelloggii</i>          | 56  | 4.8  | 0.2 | 14.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 52  | 5.2  | 0.2 | 30.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 48  | 4.9  | 0.2 | 16.0 |
|  | AECA  | <i>Aesculus californica</i>       | 33  | 3.0  | 0.2 | 7.0  |
|  | ARME  | <i>Arbutus menziesii</i>          | 22  | 1.1  | 0.2 | 2.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 78  | 2.4  | 0.1 | 15.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 67  | 4.1  | 0.2 | 25.0 |
|  | QUGA4 | * <i>Quercus garryana</i>         | 59  | 2.1  | 0.2 | 10.2 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 26  | 0.2  | 0.2 | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 74  | 1.8  | 0.2 | 6.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 37  | 1.7  | 0.2 | 5.0  |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 67  | 3.8  | 0.2 | 10.0 |
|  | TOAR  | <i>Torilis arvensis</i>           | 56  | 0.9  | 0.2 | 4.0  |
|  | ELGL  | <i>Elymus glaucus</i>             | 48  | 0.7  | 0.2 | 2.0  |
|  | BRMA  | <i>Briza maxima</i>               | 41  | 4.1  | 0.2 | 20.0 |
|  | FECA  | <i>Festuca californica</i>        | 41  | 2.8  | 0.2 | 8.0  |
|  | PETR7 | <i>Pentagramma triangularis</i>   | 33  | 0.5  | 0.2 | 3.0  |
|  | CHPO3 | <i>Chlorogalum pomeridianum</i>   | 30  | 0.6  | 0.2 | 2.0  |
|  | IRIS  | <i>Iris</i>                       | 26  | 0.2  | 0.2 | 0.2  |
|  | BRDI3 | <i>Bromus diandrus</i>            | 22  | 1.4  | 0.2 | 4.0  |
|  | BRCA5 | <i>Bromus carinatus</i>           | 22  | 0.3  | 0.2 | 1.0  |
|  | SACR2 | <i>Sanicula crassicaulis</i>      | 22  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |       |                                   |     |      |     |      |
|  | 2MOSS | Moss                              | 67  | 3.4  | 0.2 | 17.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Quercus garryana* / (*Cynosurus echinatus* – *Festuca californica*)  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (5), Coastal Franciscan/263Ag (6), Coastal Hills-Santa Rosa Plain/263Aj (2), and Mount St. Helena Flows and Valleys/263Am (8) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.9         | 28–85         | –          |
| <b>Herb</b>                          | 42.8         | 20–75         | <0.5–2     |
| <b>Shrub</b>                         | 4.5          | 0–19          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 2.0          | 0–12          | <0.5–15    |
| <b>Hardwood</b>                      | 28.1         | 10–46         | 2–20       |
| <b>Conifer</b>                       | 1.1          | 0–19          | 10–20      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (9), NW (5), SE (2), SW (5)

**Macrotopography:** lower 1/3 of slope (1), lower 1/3 of slope to ridge top (1), lower to middle 1/3 of slope (2), lower to upper 1/3 of slope (2), middle 1/3 of slope (6), middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (3), ridge top (1), upper 1/3 of slope (4)

**Microtopography:** concave (1), convex (11), flat (3), undulating (6)

**Parent material:** basalt (1), blue schist (2), Franciscan melange (3), greenstone (2), sandstone (5), sedimentary (1), serpentine (1), volcanic (6)

**Soil texture:** clay or clay loam (8), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (17), steep/>25° (2)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 784 ft. | 254–1712 ft. |
| <b>Slope</b>             | 17.1°   | 3–36°        |
| <b>Large rock cover</b>  | 3.7%    | 0–30%        |
| <b>Small rock cover</b>  | 4.8%    | 0–20%        |
| <b>Bare ground cover</b> | 17.7%   | 1–61%        |
| <b>Litter cover</b>      | 63.6%   | 0–97%        |

**Samples Used to Describe Association (n=21)**

**Rapid Assessments:** SONO0066, SONO0089, SONO0113, SONO0210, SONO0218, SONO0312, SONO0330, SONO0384, SONO0611, SONO0620, SONO0621, SONO0634, SONO0805, SONO0824, SONO0827, SONO0857, SONO0858, SONO0949, SONO0991

**Relevés:** SONO0114, SONO0116

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Quercus garryana* / (*Cynosurus echinatus* – *Festuca californica*) Provisional Association**

n = 21

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Tree</b>                            |             |                                   |            |            |            |            |
|  | QUGA4       | * <i>Quercus garryana</i>         | 100        | 23.9       | 8.0        | 40.0       |
|  | QUKE        | * <i>Quercus kelloggii</i>        | 57         | 4.4        | 1.0        | 15.0       |
|  | QUAG        | * <i>Quercus agrifolia</i>        | 48         | 1.1        | 0.2        | 3.0        |
|  | UMCA        | * <i>Umbellularia californica</i> | 43         | 1.6        | 0.2        | 7.0        |
|  | ARME        | * <i>Arbutus menziesii</i>        | 29         | 1.3        | 0.2        | 4.0        |
|  | PSME        | * <i>Pseudotsuga menziesii</i>    | 24         | 0.7        | 0.2        | 2.0        |
| <b>Regenerating or Understory Tree</b> |             |                                   |            |            |            |            |
|  | PSME        | * <i>Pseudotsuga menziesii</i>    | 62         | 0.9        | 0.2        | 8.2        |
|  | UMCA        | * <i>Umbellularia californica</i> | 57         | 1.2        | 0.2        | 4.2        |
|  | QUGA4       | * <i>Quercus garryana</i>         | 57         | 0.5        | 0.1        | 2.2        |
|  | QUAG        | * <i>Quercus agrifolia</i>        | 48         | 0.3        | 0.2        | 1.0        |
|  | ARME        | * <i>Arbutus menziesii</i>        | 33         | 1.4        | 0.2        | 4.2        |
|  | QUKE        | * <i>Quercus kelloggii</i>        | 24         | 0.4        | 0.2        | 1.0        |
| <b>Shrub</b>                           |             |                                   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i> | 86         | 1.5        | 0.2        | 5.0        |
|  | ARMA        | <i>Arctostaphylos manzanita</i>   | 48         | 3.9        | 0.2        | 18.0       |
|  | LOHI2       | <i>Lonicera hispidula</i>         | 33         | 1.0        | 0.2        | 5.0        |
|  | BAPI        | <i>Baccharis pilularis</i>        | 24         | 0.7        | 0.2        | 2.0        |
| <b>Herb</b>                            |             |                                   |            |            |            |            |
|  | BRMA        | <i>Briza maxima</i>               | 81         | 16.3       | 0.2        | 70.0       |
|  | FECA        | <i>Festuca californica</i>        | 67         | 15.7       | 0.2        | 56.0       |
|  | CYEC        | <i>Cynosurus echinatus</i>        | 67         | 13.5       | 0.2        | 30.0       |
|  | CHPO3       | <i>Chlorogalum pomeridianum</i>   | 52         | 1.5        | 0.2        | 6.0        |
|  | ELGL        | <i>Elymus glaucus</i>             | 52         | 1.4        | 0.2        | 7.0        |
|  | TOAR        | <i>Torilis arvensis</i>           | 38         | 0.3        | 0.2        | 1.0        |
|  | AVENA       | <i>Avena</i>                      | 29         | 4.7        | 0.2        | 12.0       |
|  | IRIS        | <i>Iris</i>                       | 24         | 0.8        | 0.2        | 3.0        |
| <b>Non-vascular</b>                    |             |                                   |            |            |            |            |
|  | 2MOSS       | Moss                              | 81         | 2.0        | 0.2        | 23.0       |
|  | 2LICHN      | Lichen                            | 33         | 0.8        | 0.2        | 2.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus kelloggii* Alliance**  
**California black oak forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus kelloggii* is dominant or co-dominant in the tree canopy with *Abies concolor*, *Arbutus menziesii*, *Calocedrus decurrens*, *Pinus attenuata*, *Pinus ponderosa*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus garryana*, *Quercus lobata*, and *Umbellularia californica*.

The range of *Quercus kelloggii* is sufficiently wide that it mixes with many species in many alliances (Gaman and Casey 2002), though it tends to occur in higher elevations than most tree oaks other than *Quercus chrysolepis*. The *Quercus kelloggii* Alliance occurs from the foothills to mid-montane elevations, from the Coast Ranges to the Klamath Mountains and the western Sierra Nevada (Barbour et al. 2007a). Conifers replace *Quercus kelloggii* on productive sites in the absence of fire. Conifer replacement is slower or lacking on unproductive sites (Howard 1992). Stands commonly have *Pinus ponderosa*, *Pinus sabiniana*, and less commonly *Pinus jeffreyi*. Mixed cismontane stands with *Pinus ponderosa* are currently placed in this alliance, despite the conifer's greater height.

Sonoma County

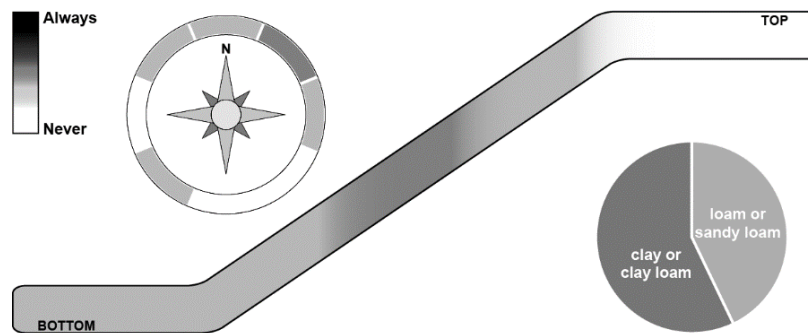
Sonoma County *Quercus kelloggii* stands are scattered and are typically small. They may be associated with stands of the Mixed Oak Alliance.

**Local Alliance Summary (n = 13)**

**Elevation:** 440–3205 ft, mean 1160 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 58.3         | 35–80         | –          |
| <b>Herb</b>             | 13.2         | 0–34          | <0.5–2     |
| <b>Shrub</b>            | 8.9          | 0–38          | <0.5–5     |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 4.6          | 0–14          | 0.5–20     |
| Hardwood                      | 42.8         | 26–65         | 5–50       |
| Conifer                       | 4.0          | 0–28          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 17.3° | 3–30°  |
| Large rock cover  | 1.3%  | 0–5%   |
| Small rock cover  | 3.6%  | 0–10%  |
| Bare ground cover | 16.6% | 1–60%  |
| Litter cover      | 77.0% | 33–95% |

**Associations within this Alliance:**

*Quercus kelloggii* – *Arbutus menziesii* – *Quercus agrifolia* Association

*Quercus kelloggii* – *Pseudotsuga menziesii* – *Umbellularia californica* Association

**STAND TABLE**

***Quercus kelloggii* Alliance**

n = 13

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 100 | 28.8 | 14.0 | 45.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 77  | 7.8  | 0.2  | 20.0 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 69  | 3.5  | 0.2  | 7.0  |
|  | QUGA4 | <i>Quercus garryana</i>           | 54  | 4.5  | 0.2  | 15.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 54  | 2.2  | 0.2  | 4.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 46  | 8.0  | 0.2  | 25.0 |
|  | QUCH2 | * <i>Quercus chrysolepis</i>      | 23  | 2.0  | 2.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 69  | 3.6  | 0.2  | 12.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 62  | 8.0  | 0.2  | 40.2 |
|  | ARME  | * <i>Arbutus menziesii</i>        | 54  | 1.7  | 0.2  | 6.0  |
|  | QUKE  | * <i>Quercus kelloggii</i>        | 54  | 0.4  | 0.2  | 1.2  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 31  | 0.5  | 0.2  | 1.2  |
|  | QUCH2 | * <i>Quercus chrysolepis</i>      | 23  | 0.5  | 0.2  | 1.0  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 77  | 4.2  | 0.2  | 23.0 |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>    | 31  | 1.1  | 0.2  | 3.0  |
|  | HODI  | <i>Holodiscus discolor</i>        | 23  | 2.1  | 0.2  | 4.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 23  | 1.1  | 0.2  | 2.0  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 46  | 6.3  | 1.0  | 15.0 |
|  | TOAR  | <i>Torilis arvensis</i>           | 46  | 0.2  | 0.2  | 0.2  |
|  | FECA  | <i>Festuca californica</i>        | 31  | 8.1  | 0.2  | 30.0 |
|  | BRDI3 | <i>Bromus diandrus</i>            | 31  | 2.1  | 0.2  | 7.0  |
|  | BRMA  | <i>Briza maxima</i>               | 31  | 1.8  | 0.2  | 5.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus kelloggii* Alliance**

n = 13

| Lifeform            | Code   | Botanical Name                                   | Con | Avg | Min | Max  |
|---------------------|--------|--|-----|-----|-----|------|
| <b>Herb</b>         |        |  |     |     |     |      |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 31  | 1.1 | 0.2 | 2.0  |
|                     | ELGL   | <i>Elymus glaucus</i>                            | 23  | 1.3 | 1.0 | 2.0  |
|                     | GALIU  | <i>Galium</i>                                    | 23  | 0.5 | 0.2 | 1.0  |
| <b>Non-vascular</b> |        |  |     |     |     |      |
|                     | 2MOSS  | Moss   | 85  | 2.1 | 0.2 | 10.0 |
|                     | 2LICHN | Lichen   | 38  | 0.4 | 0.2 | 1.0  |

***Quercus kelloggii* – *Arbutus menziesii* – *Quercus agrifolia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (2), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 53.8         | 35–80         | –          |
| <b>Herb</b>                          | 17.0         | 4–34          | <0.5–2     |
| <b>Shrub</b>                         | 1.6          | 0–6           | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 6.6          | 0.2–14        | 2–5        |
| <b>Hardwood</b>                      | 42.5         | 33–57         | 5–20       |
| <b>Conifer</b>                       | 0.3          | 0–1           | 20–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), variable (1)

**Macrotopography:** middle 1/3 of slope (2), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** convex (1), flat (1), undulating (2)

**Parent material:** conglomerate (1), Franciscan melange (1), sandstone (1), volcanic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2), steep/>25° (1)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1101 ft. | 644–1779 ft. |
| <b>Slope</b>             | 11.0°    | 4–16°        |
| <b>Large rock cover</b>  | 0.4%     | 0–1%         |
| <b>Small rock cover</b>  | 1.9%     | 1–3%         |
| <b>Bare ground cover</b> | 3.0%     | 1–5%         |
| <b>Litter cover</b>      | 92.7%    | 90–95%       |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0054, SONO0699, SONO0715, SONO0861

**Relevés:** none

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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SCV Global/State Rank: G3?/S3?¹

**STAND TABLE**

***Quercus kelloggii* – *Arbutus menziesii* – *Quercus agrifolia* Association**

n = 4

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | QUKE   | * <i>Quercus kelloggii</i>                       | 100 | 32.5 | 25.0 | 40.0 |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 100 | 5.0  | 3.0  | 7.0  |
|  | QUGA4  | * <i>Quercus garryana</i>                        | 75  | 3.4  | 0.2  | 8.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                | 75  | 2.7  | 0.2  | 5.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                       | 75  | 2.7  | 1.0  | 4.0  |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                     | 25  | 2.0  | 2.0  | 2.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 25  | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | ARME   | * <i>Arbutus menziesii</i>                       | 100 | 2.6  | 0.2  | 6.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 75  | 4.8  | 0.2  | 12.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 50  | 1.1  | 0.2  | 2.0  |
|  | QUKE   | * <i>Quercus kelloggii</i>                       | 50  | 0.7  | 0.2  | 1.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>                       | 25  | 1.2  | 1.2  | 1.2  |
|  | QUGA4  | * <i>Quercus garryana</i>                        | 25  | 1.2  | 1.2  | 1.2  |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                     | 25  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 50  | 1.1  | 0.2  | 2.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 25  | 2.0  | 2.0  | 2.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                   | 25  | 1.0  | 1.0  | 1.0  |
|  | ROGY   | <i>Rosa gymnocarpa</i>                           | 25  | 1.0  | 1.0  | 1.0  |
|  | HODI   | <i>Holodiscus discolor</i>                       | 25  | 0.2  | 0.2  | 0.2  |
|  | QUBE5  | <i>Quercus berberidifolia</i>                    | 25  | 0.2  | 0.2  | 0.2  |
|  | SYAL   | <i>Symphoricarpos albus</i>                      | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 50  | 1.1  | 0.2  | 2.0  |
|  | BRMA   | <i>Briza maxima</i>                              | 50  | 1.0  | 1.0  | 1.0  |
|  | VICIA  | <i>Vicia</i>                                     | 50  | 0.6  | 0.2  | 1.0  |
|  | GALIU  | <i>Galium</i>                                    | 50  | 0.6  | 0.2  | 1.0  |
|  | BRDI3  | <i>Bromus diandrus</i>                           | 50  | 0.6  | 0.2  | 1.0  |
|  | FECA   | <i>Festuca californica</i>                       | 25  | 30.0 | 30.0 | 30.0 |
|  | AVBA   | <i>Avena barbata</i>                             | 25  | 7.0  | 7.0  | 7.0  |
|  | CYEC   | <i>Cynosurus echinatus</i>                       | 25  | 1.0  | 1.0  | 1.0  |
|  | IRMA   | <i>Iris macrosiphon</i>                          | 25  | 1.0  | 1.0  | 1.0  |
|  | MECA2  | <i>Melica californica</i>                        | 25  | 1.0  | 1.0  | 1.0  |
|  | STACH  | <i>Stachys</i>                                   | 25  | 1.0  | 1.0  | 1.0  |
|  | SACR2  | <i>Sanicula crassicaulis</i>                     | 25  | 0.2  | 0.2  | 0.2  |
|  | TORIL  | <i>Torilis</i>                                   | 25  | 0.2  | 0.2  | 0.2  |
|  | OSMOR  | <i>Osmorhiza</i>                                 | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus kelloggii* – *Arbutus menziesii* – *Quercus agrifolia* Association**

n = 4

| Lifeform            | Code   | Botanical Name          | Con | Avg | Min | Max |
|---------------------|--------|-------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |        |                         |     |     |     |     |
|                     | ELYMU  | <i>Elymus</i>           | 25  | 0.2 | 0.2 | 0.2 |
|                     | CYNOS2 | <i>Cynosurus</i>        | 25  | 0.2 | 0.2 | 0.2 |
|                     | TOAR   | <i>Torilis arvensis</i> | 25  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                         |     |     |     |     |
|                     | 2MOSS  | Moss                    | 75  | 1.3 | 1.0 | 2.0 |
|                     | 2LICHN | Lichen                  | 25  | 1.0 | 1.0 | 1.0 |

***Quercus kelloggii* – *Pseudotsuga menziesii* – *Umbellularia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (4), and Mount St. Helena Flows and Valleys/263Am (4) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.3         | 50–75         | –          |
| <b>Herb</b>                          | 11.6         | 0–25          | <0.5–1     |
| <b>Shrub</b>                         | 12.2         | 0.2–38        | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 3.8          | 0–10          | 0.5–20     |
| <b>Hardwood</b>                      | 43.0         | 26–65         | 5–50       |
| <b>Conifer</b>                       | 5.7          | 0–28          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (4), NW (4), SW (1)

**Macrotopography:** bottom (1), bottom to lower 1/3 of slope (1), lower 1/3 of slope (2), lower to middle 1/3 of slope (1), middle 1/3 of slope (2), upper 1/3 of slope (2)

**Microtopography:** concave (5), convex (1), flat (1), undulating (2)

**Parent material:** basalt (1), Franciscan melange (3), greenstone (1), sandstone (1), volcanic (3)

**Soil texture:** clay or clay loam (3), loam or sandy loam (3)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (4), steep/>25° (4)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1186 ft. | 440–3205 ft. |
| <b>Slope</b>             | 19.6°    | 3–30°        |
| <b>Large rock cover</b>  | 1.6%     | 0–5%         |
| <b>Small rock cover</b>  | 4.2%     | 0–10%        |
| <b>Bare ground cover</b> | 21.8%    | 2–60%        |
| <b>Litter cover</b>      | 71.1%    | 33–90%       |

**Samples Used to Describe Association (n=9)**

**Rapid Assessments:** SONO0130, SONO0203, SONO0272, SONO0612, SONO0687, SONO0808, SONO0828, SONO0980, SONO0984

**Relevés:** none



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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SCV Global/State Rank: G3?/S3?¹

**STAND TABLE**

***Quercus kelloggii* – *Pseudotsuga menziesii* – *Umbellularia californica* Association**

n = 9

| Lifeform                               | Code   | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | QUKE   | * <i>Quercus kelloggii</i>                         | 100 | 27.2 | 14.0 | 45.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                  | 78  | 10.0 | 4.0  | 20.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                     | 56  | 9.4  | 0.2  | 25.0 |
|  | ARME   | * <i>Arbutus menziesii</i>                         | 56  | 2.2  | 0.2  | 5.0  |
|  | QUGA4  | <i>Quercus garryana</i>                            | 44  | 5.3  | 1.0  | 15.0 |
|  | QUAG   | * <i>Quercus agrifolia</i>                         | 44  | 1.8  | 0.2  | 4.0  |
|  | ACMA3  | <i>Acer macrophyllum</i>                           | 22  | 7.5  | 7.0  | 8.0  |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                       | 22  | 2.0  | 2.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                  | 67  | 10.2 | 0.2  | 40.2 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                     | 67  | 3.0  | 0.2  | 9.0  |
|  | QUKE   | * <i>Quercus kelloggii</i>                         | 56  | 0.2  | 0.2  | 0.4  |
|  | ARME   | * <i>Arbutus menziesii</i>                         | 33  | 0.5  | 0.2  | 1.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|  | QUCH2  | * <i>Quercus chrysolepis</i>                       | 22  | 0.3  | 0.2  | 0.4  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                  | 89  | 5.0  | 0.2  | 23.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                     | 33  | 1.1  | 0.2  | 3.0  |
|  | HODI   | <i>Holodiscus discolor</i>                         | 22  | 3.0  | 2.0  | 4.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                         | 22  | 2.5  | 2.0  | 3.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                          | 22  | 0.6  | 0.2  | 1.0  |
|  | LOINL  | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 22  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | CYEC   | <i>Cynosurus echinatus</i>                         | 56  | 7.4  | 2.0  | 15.0 |
|  | TOAR   | <i>Torilis arvensis</i>                            | 56  | 0.2  | 0.2  | 0.2  |
|  | ELGL   | <i>Elymus glaucus</i>                              | 33  | 1.3  | 1.0  | 2.0  |
|  | FECA   | <i>Festuca californica</i>                         | 33  | 0.8  | 0.2  | 2.0  |
|  | BRDI3  | <i>Bromus diandrus</i>                             | 22  | 3.6  | 0.2  | 7.0  |
|  | BRMA   | <i>Briza maxima</i>                                | 22  | 2.6  | 0.2  | 5.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>   | 22  | 1.1  | 0.2  | 2.0  |
|  | BRCA5  | <i>Bromus carinatus</i>                            | 22  | 0.6  | 0.2  | 1.0  |
|  | DRAR3  | <i>Dryopteris arguta</i>                           | 22  | 0.6  | 0.2  | 1.0  |
|  | PETR7  | <i>Pentagramma triangularis</i>                    | 22  | 0.2  | 0.2  | 0.2  |
|  | CAPY2  | <i>Carduus pycnocephalus</i>                       | 22  | 0.2  | 0.2  | 0.2  |
|  | MELIC  | <i>Melica</i>                                      | 22  | 0.2  | 0.2  | 0.2  |
|  | OSBE   | <i>Osmorhiza berteroi</i>                          | 22  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 89  | 2.5  | 0.2  | 10.0 |
|  | 2LICHN | Lichen   | 44  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Quercus lobata* Alliance**

### **Valley oak woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus lobata* is dominant or co-dominant in the tree canopy with *Acer negundo*, *Alnus rhombifolia*, *Fraxinus latifolia*, *Juglans hindsii*, *Juglans hindsii* × *regia*, *Platanus racemosa*, *Populus fremontii*, *Quercus agrifolia*, *Quercus douglasii*, *Quercus kelloggii*, *Quercus wislizeni*, *Salix gooddingii*, and *Salix lasiolepis*. Shrubs and lianas may include *Aristolochia californica* or *Vitis californica*.

*Quercus lobata* is endemic to California, and stands vary from open savannas to closed-canopy forests (Allen-Diaz et al. 2007). Riparian and upland forests of *Quercus lobata* occur in the deep, rich soil typical of floodplains and valley floors. Riparian *Quercus lobata* stands typically exist on higher portions of the floodplain than do stands of *Populus fremontii* and willows (Holstein 1984, Vaghti and Greco 2007). The *Quercus lobata* forests currently found in California are only remnants of what once existed in the Central Valley, other valleys, and foothill locations (Allen-Diaz et al. 2007).

### Sonoma County

*Quercus lobata* stands in Sonoma County include both riparian and upland associations.

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### **Local Alliance Summary (n = 15)**

**Elevation:** 62–1531 ft, mean 506 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

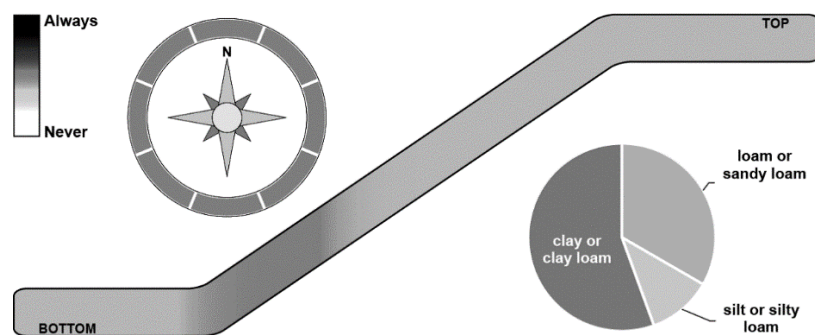
#### **Noteworthy Taxa**

*Lilium pardalinum* ssp. *pitkinense*

CA rare plant rank: 1B.1

NatureServe global/state rank: G5T1/S1

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 61.9         | 30–95         | –          |
| Herb                          | 31.5         | 0–70          | <0.5–1     |
| Shrub                         | 16.3         | 0–80          | <0.5–5     |
| Regenerating/understory tree* | 2.1          | 0–9           | <0.5–10    |
| Hardwood                      | 31.3         | 5–75          | 5–35       |
| Conifer                       | 0.0          | 0–0.2         | 15–20      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 6.8°  | 0–30°  |
| Large rock cover  | 1.0%  | 0–7%   |
| Small rock cover  | 4.3%  | 0–20%  |
| Bare ground cover | 20.8% | 1–81%  |
| Litter cover      | 69.1% | 17–98% |

**Associations within this Alliance:**

- Quercus lobata* – *Fraxinus latifolia* / (*Vitis californica*) Association
- Quercus lobata* – *Quercus agrifolia* / Grass Association
- Quercus lobata* / Grass Association
- Quercus lobata* / *Rubus ursinus* – *Rosa californica* Provisional Association

**STAND TABLE**

***Quercus lobata* Alliance**

n = 15

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | QULO  | * <i>Quercus lobata</i>           | 93  | 19.0 | 5.0 | 40.0 |
|  | FRLA  | * <i>Fraxinus latifolia</i>       | 33  | 13.6 | 2.0 | 30.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 33  | 4.8  | 1.0 | 14.0 |
|  | QUKE  | <i>Quercus kelloggii</i>          | 27  | 12.8 | 0.2 | 30.0 |
|  | SALA3 | <i>Salix laevigata</i>            | 20  | 3.1  | 0.2 | 9.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | QULO  | * <i>Quercus lobata</i>           | 53  | 0.8  | 0.2 | 2.2  |
|  | FRLA  | * <i>Fraxinus latifolia</i>       | 33  | 3.7  | 0.2 | 9.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 33  | 0.4  | 0.2 | 1.0  |
|  | PRCE2 | <i>Prunus cerasifera</i>          | 20  | 0.9  | 0.2 | 2.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 60  | 5.7  | 0.2 | 32.0 |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 40  | 26.3 | 1.0 | 70.0 |
|  | RUUR  | <i>Rubus ursinus</i>              | 27  | 8.9  | 0.2 | 30.0 |
|  | BAPI  | <i>Baccharis pilularis</i>        | 20  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |       |                                   |     |      |     |      |
|  | AVBA  | <i>Avena barbata</i>              | 47  | 11.3 | 1.0 | 40.0 |
|  | BRMA  | <i>Briza maxima</i>               | 47  | 6.7  | 0.2 | 19.0 |
|  | BRDI3 | <i>Bromus diandrus</i>            | 40  | 3.1  | 0.2 | 16.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus lobata* Alliance**

n = 15

| Lifeform            | Code   | Botanical Name                  | Con | Avg  | Min | Max  |
|---------------------|--------|---------------------------------|-----|------|-----|------|
| <b>Herb</b>         |        |                                 |     |      |     |      |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i> | 33  | 1.1  | 0.2 | 3.0  |
|                     | ELGL   | <i>Elymus glaucus</i>           | 27  | 2.3  | 0.2 | 5.0  |
|                     | RUCR   | <i>Rumex crispus</i>            | 27  | 1.3  | 1.0 | 2.0  |
|                     | BRHO2  | <i>Bromus hordeaceus</i>        | 20  | 11.3 | 2.0 | 30.0 |
|                     | CYEC   | <i>Cynosurus echinatus</i>      | 20  | 5.3  | 1.0 | 11.0 |
|                     | BRCA5  | <i>Bromus carinatus</i>         | 20  | 1.4  | 0.2 | 3.0  |
| <b>Non-vascular</b> |        |                                 |     |      |     |      |
|                     | 2MOSS  | Moss                            | 53  | 0.6  | 0.2 | 2.0  |
|                     | 2LICHN | Lichen                          | 27  | 0.2  | 0.2 | 0.2  |

**Noteworthy Taxa**

*Lilium pardalinum* ssp. *pitkinense*

CA rare plant rank: 1B.1

NatureServe global/state rank: G5T1/S1

***Quercus lobata* – *Fraxinus latifolia* / (*Vitis californica*) Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 81.0         | 72–95         | –          |
| <b>Herb</b>                          | 25.3         | 0–53          | <0.5–1     |
| <b>Shrub</b>                         | 33.5         | 4–80          | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 5.5          | 3–9           | 2–10       |
| <b>Hardwood</b>                      | 49.5         | 25–75         | 10–20      |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (3), variable (1)

**Macrotopography:** bottom (2), lower 1/3 of slope (2)

**Microtopography:** concave (1), flat (2), undulating (1)

**Parent material:** clayey alluvium (1), sandstone (1), sedimentary (1), silty alluvium (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1), silt or silt loam (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (2)

|                          | Mean   | Range      |
|--------------------------|--------|------------|
| <b>Elevation</b>         | 72 ft. | 62–100 ft. |
| <b>Slope</b>             | 0.5°   | 0–1°       |
| <b>Large rock cover</b>  | 0.0%   | 0–0%       |
| <b>Small rock cover</b>  | 1.4%   | 0–5%       |
| <b>Bare ground cover</b> | 7.8%   | 5–11%      |
| <b>Litter cover</b>      | 78.3%  | 53–93%     |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0200, SONO0223, SONO0229, SONO0323

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Quercus lobata* – *Fraxinus latifolia* / (*Vitis californica*) Association**

n = 4

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>                            |             |   |            |            |            |            |
|  | QULO        | * <i>Quercus lobata</i>                   | 100        | 30.3       | 16.0       | 40.0       |
|  | FRLA        | * <i>Fraxinus latifolia</i>               | 100        | 16.5       | 2.0        | 30.0       |
|  | PRCE2       | * <i>Prunus cerasifera</i>                | 25         | 20.0       | 20.0       | 20.0       |
|  | SALA3       | <i>Salix laevigata</i>                    | 25         | 9.0        | 9.0        | 9.0        |
|  | PRUNU       | <i>Prunus</i>                             | 25         | 4.0        | 4.0        | 4.0        |
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | FRLA        | * <i>Fraxinus latifolia</i>               | 100        | 4.6        | 3.0        | 9.0        |
|  | QULO        | * <i>Quercus lobata</i>                   | 50         | 1.3        | 0.4        | 2.2        |
|  | PRCE2       | * <i>Prunus cerasifera</i>                | 50         | 1.2        | 0.2        | 2.2        |
|  | JUHI        | <i>Juglans hindsii</i>                    | 25         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |   |            |            |            |            |
|  | RUAR9       | <i>Rubus armeniacus</i>                   | 75         | 26.3       | 1.0        | 70.0       |
|  | RUUR        | <i>Rubus ursinus</i>                      | 75         | 1.8        | 0.2        | 5.0        |
|  | TODI        | <i>Toxicodendron diversilobum</i>         | 50         | 21.0       | 10.0       | 32.0       |
|  | SALA6       | <i>Salix lasiolepis</i>                   | 25         | 6.0        | 6.0        | 6.0        |
|  | ROCA2       | <i>Rosa californica</i>                   | 25         | 3.0        | 3.0        | 3.0        |
|  | COSE16      | <i>Cornus sericea</i>                     | 25         | 1.0        | 1.0        | 1.0        |
|  | ROSA5       | <i>Rosa</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|  | SANIC5      | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 25         | 0.2        | 0.2        | 0.2        |
|  | SYAL        | <i>Symphoricarpos albus</i>               | 25         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | RUCR        | <i>Rumex crispus</i>                      | 75         | 1.3        | 1.0        | 2.0        |
|  | CAREX       | <i>Carex</i>                              | 50         | 35.0       | 25.0       | 45.0       |
|  | LEMI3       | <i>Lemna minor</i>                        | 25         | 10.0       | 10.0       | 10.0       |
|  | BRCA5       | <i>Bromus carinatus</i>                   | 25         | 3.0        | 3.0        | 3.0        |
|  | AGEX        | <i>Agrostis exarata</i>                   | 25         | 3.0        | 3.0        | 3.0        |
|  | LETR5       | <i>Leymus triticoides</i>                 | 25         | 2.0        | 2.0        | 2.0        |
|  | CHPO3       | <i>Chlorogalum pomeridianum</i>           | 25         | 1.0        | 1.0        | 1.0        |
|  | CIIN        | <i>Cichorium intybus</i>                  | 25         | 1.0        | 1.0        | 1.0        |
|  | IRPS        | <i>Iris pseudacorus</i>                   | 25         | 1.0        | 1.0        | 1.0        |
|  | ERAR11      | <i>Eryngium aristulatum</i>               | 25         | 0.2        | 0.2        | 0.2        |
|  | VIMA        | <i>Vinca major</i>                        | 25         | 0.2        | 0.2        | 0.2        |
|  | PIEC        | <i>Picris echioides</i>                   | 25         | 0.2        | 0.2        | 0.2        |
|  | LOPE        | <i>Lolium perenne</i>                     | 25         | 0.2        | 0.2        | 0.2        |
|  | EUOC4       | <i>Euthamia occidentalis</i>              | 25         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus lobata* – *Fraxinus latifolia* / (*Vitis californica*) Association**

n = 4

| Lifeform     | Code   | Botanical Name                 | Con | Avg | Min | Max |
|--------------|--------|--------------------------------|-----|-----|-----|-----|
| Herb         | DACA6  | <i>Daucus carota</i>           | 25  | 0.2 | 0.2 | 0.2 |
|              | COMA2  | <i>Conium maculatum</i>        | 25  | 0.2 | 0.2 | 0.2 |
|              | CHBE4  | <i>Chenopodium berlandieri</i> | 25  | 0.2 | 0.2 | 0.2 |
|              | CHAL7  | <i>Chenopodium album</i>       | 25  | 0.2 | 0.2 | 0.2 |
|              | CAOB3  | <i>Carex obnupta</i>           | 25  | 0.2 | 0.2 | 0.2 |
|              | BRDI3  | <i>Bromus diandrus</i>         | 25  | 0.2 | 0.2 | 0.2 |
|              | ARIST2 | <i>Aristolochia</i>            | 25  | 0.2 | 0.2 | 0.2 |
|              | LELA2  | <i>Lepidium latifolium</i>     | 25  | 0.2 | 0.2 | 0.2 |
| Non-vascular |        |                                |     |     |     |     |
|              | 2MOSS  | Moss                           | 75  | 0.7 | 0.2 | 1.0 |
|              | 2LICHN | Lichen                         | 50  | 0.2 | 0.2 | 0.2 |

***Quercus lobata* – *Quercus agrifolia* / Grass Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2), Coastal Franciscan/263Ag (1), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 60.3         | 40–75         | –          |
| Herb                          | 40.8         | 16–70         | <0.5–1     |
| Shrub                         | 3.1          | 0.2–4         | 0.5–5      |
| Regenerating/understory tree* | 0.9          | 0.2–2         | <0.5–5     |
| Hardwood                      | 22.8         | 9–30          | 10–15      |
| Conifer                       | 0.1          | 0–0.2         | 15–20      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (1), SW (1), variable (1)

**Macrotopography:** bottom to lower 1/3 of slope (1), lower to middle 1/3 of slope (1), middle to upper 1/3 of slope (2)

**Microtopography:** concave (1), undulating (3)

**Parent material:** Franciscan melange (2), metasedimentary (1), mixed alluvium (1)

**Soil texture:** clay or clay loam (3)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (2)

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 764 ft. | 314–1208 ft. |
| Slope             | 9.3°    | 1–23°        |
| Large rock cover  | 1.3%    | 0–3%         |
| Small rock cover  | 8.8%    | 3–20%        |
| Bare ground cover | 15.8%   | 5–22%        |
| Litter cover      | 72.3%   | 55–89%       |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0263, SONO0363, SONO0686, SONO0704

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Quercus lobata* – *Quercus agrifolia* / Grass Association**

n = 4

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                              | 100 | 5.8  | 2.0  | 14.0 |
|  | QULO   | * <i>Quercus lobata</i>                                 | 75  | 12.0 | 6.0  | 16.0 |
|  | QUKE   | * <i>Quercus kelloggii</i>                              | 50  | 4.6  | 0.2  | 9.0  |
|  | AECA   | * <i>Aesculus californica</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|  | QUERC  | * <i>Quercus</i>  | 25  | 20.0 | 20.0 | 20.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                       | 25  | 8.0  | 8.0  | 8.0  |
|  | ACMA3  | <i>Acer macrophyllum</i>                                | 25  | 3.0  | 3.0  | 3.0  |
|  | FRLA   | * <i>Fraxinus latifolia</i>                             | 25  | 2.0  | 2.0  | 2.0  |
|  | PISA2  | <i>Pinus sabiniana</i>                                  | 25  | 0.2  | 0.2  | 0.2  |
|  | SALA3  | * <i>Salix laevigata</i>                                | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                              | 100 | 0.4  | 0.2  | 1.0  |
|  | QULO   | * <i>Quercus lobata</i>                                 | 75  | 0.5  | 0.2  | 1.0  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                            | 25  | 0.4  | 0.4  | 0.4  |
|  | UMCA   | * <i>Umbellularia californica</i>                       | 25  | 0.2  | 0.2  | 0.2  |
|  | AECA   | * <i>Aesculus californica</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | FRLA   | * <i>Fraxinus latifolia</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|  | QUERC  | * <i>Quercus</i>  | 25  | 0.2  | 0.2  | 0.2  |
|  | QUKE   | * <i>Quercus kelloggii</i>                              | 25  | 0.2  | 0.2  | 0.2  |
|  | SALA3  | * <i>Salix laevigata</i>                                | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                       | 100 | 2.1  | 0.2  | 4.0  |
|  | QUBE5  | <i>Quercus berberidifolia</i>                           | 25  | 2.0  | 2.0  | 2.0  |
|  | SYAL   | <i>Symphoricarpos albus</i>                             | 25  | 1.0  | 1.0  | 1.0  |
|  | ARMAG  | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 25  | 0.2  | 0.2  | 0.2  |
|  | BAPI   | <i>Baccharis pilularis</i>                              | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AVBA   | <i>Avena barbata</i>                                    | 75  | 16.3 | 1.0  | 40.0 |
|  | BRMA   | <i>Briza maxima</i>                                     | 75  | 12.3 | 3.0  | 19.0 |
|  | ELGL   | <i>Elymus glaucus</i>                                   | 75  | 3.0  | 2.0  | 5.0  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                         | 50  | 0.6  | 0.2  | 1.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                                | 25  | 30.0 | 30.0 | 30.0 |
|  | CYNOS2 | <i>Cynosurus</i>  | 25  | 8.0  | 8.0  | 8.0  |
|  | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>             | 25  | 1.0  | 1.0  | 1.0  |
|  | PEKE   | <i>Perideridia kelloggii</i>                            | 25  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus lobata* – *Quercus agrifolia* / Grass Association**

n = 4

| Lifeform            | Code   | Botanical Name                   | Con | Avg | Min | Max |
|---------------------|--------|----------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |        |                                  |     |     |     |     |
|                     | BRCA5  | <i>Bromus carinatus</i>          | 25  | 1.0 | 1.0 | 1.0 |
|                     | BRDI3  | <i>Bromus diandrus</i>           | 25  | 1.0 | 1.0 | 1.0 |
|                     | TRLA16 | <i>Triteleia laxa</i>            | 25  | 0.2 | 0.2 | 0.2 |
|                     | VICIA  | <i>Vicia</i>                     | 25  | 0.2 | 0.2 | 0.2 |
|                     | TRHI4  | <i>Trifolium hirtum</i>          | 25  | 0.2 | 0.2 | 0.2 |
|                     | STRI   | <i>Stachys rigida</i>            | 25  | 0.2 | 0.2 | 0.2 |
|                     | STACH  | <i>Stachys</i>                   | 25  | 0.2 | 0.2 | 0.2 |
|                     | NAPU4  | <i>Nassella pulchra</i>          | 25  | 0.2 | 0.2 | 0.2 |
|                     | EPBR3  | <i>Epilobium brachycarpum</i>    | 25  | 0.2 | 0.2 | 0.2 |
|                     | CHAN2  | <i>Chlorogalum angustifolium</i> | 25  | 0.2 | 0.2 | 0.2 |
|                     | CALYS  | <i>Calystegia</i>                | 25  | 0.2 | 0.2 | 0.2 |
|                     | BRLA3  | <i>Bromus laevipes</i>           | 25  | 0.2 | 0.2 | 0.2 |
|                     | WYGL   | <i>Wyethia glabra</i>            | 25  | 0.2 | 0.2 | 0.2 |
|                     | ARDO3  | <i>Artemisia douglasiana</i>     | 25  | 0.2 | 0.2 | 0.2 |
|                     | ACMI2  | <i>Achillea millefolium</i>      | 25  | 0.2 | 0.2 | 0.2 |
|                     | GALIU  | <i>Galium</i>                    | 25  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                                  |     |     |     |     |
|                     | 2MOSS  | Moss                             | 25  | 0.2 | 0.2 | 0.2 |

***Quercus lobata* / Grass Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (3), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 39.8         | 30–56         | –          |
| <b>Herb</b>                          | 23.4         | 14–33         | <0.5–1     |
| <b>Shrub</b>                         | 1.0          | 0–5           | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.7          | 0–3           | <0.5–0.5   |
| <b>Hardwood</b>                      | 19.0         | 5–45          | 5–35       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), NW (1), SE (1), variable (2)

**Macrotopography:** bottom to lower 1/3 of slope (1), lower 1/3 of slope (1), middle 1/3 of slope (1), middle 1/3 of slope to ridgetop (1), upper 1/3 of slope (1)

**Microtopography:** concave (2), convex (2), undulating (1)

**Parent material:** Franciscan melange (1), sandstone (1), shale (1), volcanic (2)

**Soil texture:** clay or clay loam (1), unknown (1)

**Slope steepness:** flat/0° (1), gentle/1-5° (1), moderate/6-25° (2), steep/>25° (1)



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|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 799 ft. | 235–1531 ft. |
| Slope             | 10.6°   | 0–30°        |
| Large rock cover  | 1.9%    | 0–7%         |
| Small rock cover  | 4.0%    | 0–12%        |
| Bare ground cover | 38.0%   | 1–81%        |
| Litter cover      | 55.0%   | 17–98%       |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0059, SONO0258, SONO0963, SONO0981, SONO2188

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Quercus lobata* / Grass Association**

n = 5

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | QULO  | * <i>Quercus lobata</i>           | 100 | 11.8 | 5.0  | 17.0 |
|  | QUWI2 | * <i>Quercus wislizeni</i>        | 20  | 30.0 | 30.0 | 30.0 |
|  | QUGA4 | <i>Quercus garryana</i>           | 20  | 5.0  | 5.0  | 5.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 20  | 1.0  | 1.0  | 1.0  |
|  | UMCA  | * <i>Umbellularia californica</i> | 20  | 1.0  | 1.0  | 1.0  |
|  | SALA3 | <i>Salix laevigata</i>            | 20  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QULO  | * <i>Quercus lobata</i>           | 40  | 0.2  | 0.2  | 0.2  |
|  | AIAL  | <i>Ailanthus altissima</i>        | 20  | 3.0  | 3.0  | 3.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 20  | 0.4  | 0.4  | 0.4  |
|  | UMCA  | * <i>Umbellularia californica</i> | 20  | 0.2  | 0.2  | 0.2  |
|  | QUWI2 | * <i>Quercus wislizeni</i>        | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 20  | 4.0  | 4.0  | 4.0  |
|  | SYMPH | <i>Symphoricarpos</i>             | 20  | 1.0  | 1.0  | 1.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 20  | 0.2  | 0.2  | 0.2  |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | AVBA  | <i>Avena barbata</i>              | 80  | 7.5  | 3.0  | 16.0 |
|  | BRDI3 | <i>Bromus diandrus</i>            | 80  | 4.4  | 0.2  | 16.0 |
|  | BRMA  | <i>Briza maxima</i>               | 80  | 2.6  | 0.2  | 5.0  |
|  | CYEC  | <i>Cynosurus echinatus</i>        | 60  | 5.3  | 1.0  | 11.0 |
|  | AETR  | <i>Aegilops triuncialis</i>       | 40  | 6.5  | 2.0  | 11.0 |
|  | BRHO2 | <i>Bromus hordeaceus</i>          | 40  | 2.0  | 2.0  | 2.0  |
|  | CAPY2 | <i>Carduus pycnocephalus</i>      | 40  | 1.6  | 0.2  | 3.0  |
|  | PLLA  | <i>Plantago lanceolata</i>        | 40  | 0.6  | 0.2  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Quercus lobata* / Grass Association**

n = 5

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | TOAR        | <i>Torilis arvensis</i>                              | 40         | 0.2        | 0.2        | 0.2        |
|                     | DIDO3       | <i>Dichondra donelliana</i>                          | 20         | 5.0        | 5.0        | 5.0        |
|                     | ERBO        | <i>Erodium botrys</i>                                | 20         | 3.0        | 3.0        | 3.0        |
|                     | NAPU4       | <i>Nassella pulchra</i>                              | 20         | 3.0        | 3.0        | 3.0        |
|                     | CRSE11      | <i>Croton setigerus</i>                              | 20         | 2.0        | 2.0        | 2.0        |
|                     | CYNOS2      | <i>Cynosurus</i>                                     | 20         | 2.0        | 2.0        | 2.0        |
|                     | LOPE        | <i>Lolium perenne</i>                                | 20         | 2.0        | 2.0        | 2.0        |
|                     | CIRSI       | <i>Cirsium</i>                                       | 20         | 1.2        | 1.2        | 1.2        |
|                     | JUPA2       | <i>Juncus patens</i>                                 | 20         | 1.0        | 1.0        | 1.0        |
|                     | LIBI5       | <i>Linum bienne</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                     | VISA        | <i>Vicia sativa</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                     | TRAL5       | <i>Trifolium albopurpureum</i>                       | 20         | 0.2        | 0.2        | 0.2        |
|                     | BRMI2       | <i>Briza minor</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | RUAC3       | <i>Rumex acetosella</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                     | RACA2       | <i>Ranunculus californicus</i>                       | 20         | 0.2        | 0.2        | 0.2        |
|                     | PHAQ        | <i>Phalaris aquatica</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                     | ELGL        | <i>Elymus glaucus</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                     | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 20         | 0.2        | 0.2        | 0.2        |
|                     | CLARK       | <i>Clarkia</i>                                       | 20         | 0.2        | 0.2        | 0.2        |
|                     | BRCA5       | <i>Bromus carinatus</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                     | ESCA2       | <i>Eschscholzia californica</i>                      | 20         | 0.2        | 0.2        | 0.2        |
|                     | CHPO3       | <i>Chlorogalum pomeridianum</i>                      | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 60         | 0.8        | 0.2        | 2.0        |
|                     | 2LICHN      | Lichen   | 20         | 0.2        | 0.2        | 0.2        |

***Quercus lobata* / *Rubus ursinus* – *Rosa californica* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 82.5                | 75–90                | –                 |
| <b>Herb</b>                          | 45.5                | 21–70                | <0.5–1            |
| <b>Shrub</b>                         | 46.5                | 30–63                | 0.5–1             |
| <b>Regenerating/understory tree*</b> | 1.5                 | 0–3                  | 2–5               |
| <b>Hardwood</b>                      | 42.5                | 25–60                | 15–20             |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (2)

**Macrotopography:** lower 1/3 of slope (2)

**Microtopography:** flat (1), undulating (1)

**Parent material:** sandstone (1), sedimentary (1)

**Summary of Environmental Data, continued**

**Soil texture:** loam or sandy loam (2)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 124 ft. | 122–126 ft. |
| <b>Slope</b>             | 5.0°    | 2–8°        |
| <b>Large rock cover</b>  | 0.0%    | 0%          |
| <b>Small rock cover</b>  | 0.0%    | 0%          |
| <b>Bare ground cover</b> | 7.0%    | 7%          |
| <b>Litter cover</b>      | 90.0%   | 90%         |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** MILOB108, SONO0221

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Quercus lobata* / *Rubus ursinus* – *Rosa californica* Provisional Association**

n = 2

| Lifeform                               | Code   | Botanical Name                            | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QULO   | * <i>Quercus lobata</i>                   | 100 | 25.0 | 10.0 | 40.0 |
|  | QUKE   | * <i>Quercus kelloggii</i>                | 100 | 21.0 | 12.0 | 30.0 |
|  | PRCE2  | * <i>Prunus cerasifera</i>                | 50  | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QULO   | * <i>Quercus lobata</i>                   | 50  | 2.2  | 2.2  | 2.2  |
|  | PRCE2  | * <i>Prunus cerasifera</i>                | 50  | 0.2  | 0.2  | 0.2  |
|  | QUKE   | * <i>Quercus kelloggii</i>                | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | RUAR9  | <i>Rubus armeniacus</i>                   | 100 | 37.5 | 30.0 | 45.0 |
|  | CRDO2  | <i>Crataegus douglasii</i>                | 100 | 0.6  | 0.2  | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>         | 100 | 0.6  | 0.2  | 1.0  |
|  | RUUR   | <i>Rubus ursinus</i>                      | 50  | 30.0 | 30.0 | 30.0 |
|  | RHOC   | <i>Rhododendron occidentale</i>           | 50  | 25.0 | 25.0 | 25.0 |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i> | 50  | 1.0  | 1.0  | 1.0  |
|  | FRCA12 | <i>Fragula californica</i>                | 50  | 1.0  | 1.0  | 1.0  |
|  | ROCA2  | <i>Rosa californica</i>                   | 50  | 1.0  | 1.0  | 1.0  |
|  | RUBUS  | <i>Rubus</i>                              | 50  | 0.2  | 0.2  | 0.2  |
|  | ROSA5  | <i>Rosa</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|  | LOHI2  | <i>Lonicera hispidula</i>                 | 50  | 0.2  | 0.2  | 0.2  |
|  | BAPI   | <i>Baccharis pilularis</i>                | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | HOLA   | <i>Holcus lanatus</i>                     | 100 | 12.5 | 10.0 | 15.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Quercus lobata* / *Rubus ursinus* – *Rosa californica* Provisional Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100        | 0.6        | 0.2        | 1.0        |
|                     | CHPO3       | <i>Chlorogalum pomeridianum</i>                  | 50         | 3.0        | 3.0        | 3.0        |
|                     | JUNCU       | <i>Juncus</i>                                    | 50         | 3.0        | 3.0        | 3.0        |
|                     | RUCR        | <i>Rumex crispus</i>                             | 50         | 1.0        | 1.0        | 1.0        |
|                     | CIAR4       | <i>Cirsium arvense</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                     | RUCO2       | <i>Rumex conglomeratus</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | CIVU        | <i>Cirsium vulgare</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                     | CALE24      | <i>Carex leptopoda</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                     | BAOR        | <i>Barbarea orthoceras</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | LIPAP5      | <i>Lilium pardalinum</i> ssp. <i>pitkinense</i>  | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2LICHN      | Lichen   | 50         | 0.2        | 0.2        | 0.2        |
|                     | 2MOSS       | Moss   | 50         | 0.2        | 0.2        | 0.2        |

**Noteworthy Taxa**

*Lilium pardalinum* ssp. *pitkinense*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G5T1/S1

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## ***Quercus parvula* var. *shrevei* Provisional Alliance**

### **Shreve oak forests**

Statewide (Sawyer et al. 2009)

*Quercus parvula* var. *shrevei* is dominant in the tree canopy with *Acer macrophyllum*, *Arbutus menziesii*, *Notholithocarpus densiflorus*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Sequoia sempervirens*, and *Umbellularia californica*.

Unlike *Quercus agrifolia* and *Quercus wislizeni*, *Quercus parvula* var. *shrevei* usually occurs as tall, single-trunked trees within a matrix of conifers and broadleaf evergreen trees. Stands are closely associated with, but distinct from, stands of *Sequoia sempervirens* or *Umbellularia californica* Alliances. *Quercus agrifolia* stands are typically intermediate in moisture conditions between Redwood and Coast Live Oak Alliances. They form dense forests on slopes and on the margins of continuous *Sequoia sempervirens* forest patches, and they are rarely in open woodland settings.

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Unless acorns and leaves are examined closely, it is often difficult to distinguish individuals of *Quercus parvula* var. *shrevei* from *Quercus wislizeni* or *Quercus wislizeni* var. *frutescens*, especially in areas where recent fire has occurred. The physical conditions under which stands of *Q. parvula* var. *shrevei* occur in Sonoma County appear to be rare. Adding to the difficulty of identification between Shreve and interior live oaks, taller individuals of *Quercus wislizeni* may mix with *Pseudotsuga* and *Notholithocarpus* and occur in settings very similar to those in which *Quercus parvula* var. *shrevei* is dominant in the Santa Cruz Mountains, where landscape position appears to be a more predictable means to differentiate the two species. The single stand of *Q. parvula* var. *shrevei* identified and sampled in the county is shrubby, perhaps due to recent fire effects.

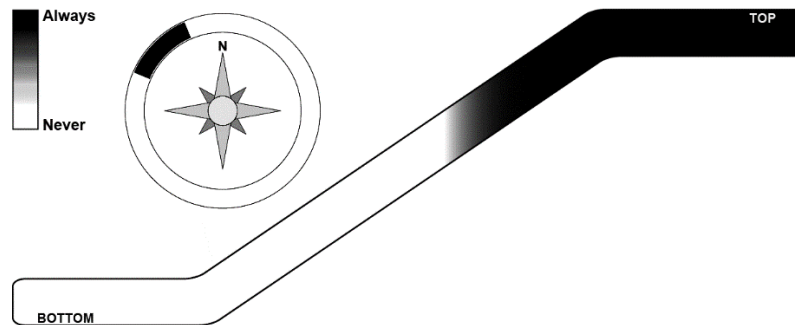
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#### **Local Alliance Summary (n = 1)**

**Elevation:** 1714 ft

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.0         | 70            | –          |
| <b>Herb</b>                          | 4.0          | 4             | 0.5–1      |
| <b>Shrub</b>                         | 17.0         | 17            | 1–2        |
| <b>Regenerating/understory tree*</b> | 52.0         | 52            | 2–5        |
| <b>Hardwood</b>                      | 1.0          | 1             | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 26.0° | 26°   |
| <b>Large rock cover</b>  | 5.0%  | 5%    |
| <b>Small rock cover</b>  | 21.0% | 21%   |
| <b>Bare ground cover</b> | 26.0% | 26%   |
| <b>Litter cover</b>      | 46.0% | 46%   |

**Associations within this Alliance:** none

**STAND TABLE**

***Quercus parvula* var. *shrevei* Provisional Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | AECA   | <i>Aesculus californica</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|  | QUCH2  | <i>Quercus chrysolepis</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|  | QUGA4  | <i>Quercus garryana</i>                             | 100 | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUPAS2 | <i>Quercus parvula</i> var. <i>shrevei</i>          | 100 | 40.2 | 40.2 | 40.2 |
|  | UMCA   | <i>Umbellularia californica</i>                     | 100 | 12.2 | 12.2 | 12.2 |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 100 | 0.4  | 0.4  | 0.4  |
|  | PIPO   | <i>Pinus ponderosa</i>                              | 100 | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 100 | 12.0 | 12.0 | 12.0 |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 100 | 2.0  | 2.0  | 2.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 100 | 1.0  | 1.0  | 1.0  |
|  | HODI   | <i>Holodiscus discolor</i>                          | 100 | 1.0  | 1.0  | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 100 | 1.0  | 1.0  | 1.0  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 100 | 0.2  | 0.2  | 0.2  |
|  | CLLA3  | <i>Clematis lasiantha</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|  | GAFR   | <i>Garrya fremontii</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|  | LOHI2  | <i>Lonicera hispidula</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|  | LOSC2  | <i>Lotus scoparius</i>                              | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | BRDI3  | <i>Bromus diandrus</i>                              | 100 | 2.0  | 2.0  | 2.0  |
|  | CYEC   | <i>Cynosurus echinatus</i>                          | 100 | 2.0  | 2.0  | 2.0  |
|  | AVBA   | <i>Avena barbata</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                     | 100 | 0.2  | 0.2  | 0.2  |
|  | ELGL   | <i>Elymus glaucus</i>                               | 100 | 0.2  | 0.2  | 0.2  |

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**STAND TABLE** continued

***Quercus parvula* var. *shrevei* Provisional Alliance**

n = 1

| Lifeform            | Code   | Botanical Name                  | Con | Avg | Min | Max |
|---------------------|--------|---------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |        |                                 |     |     |     |     |
|                     | GAPO   | <i>Galium porrigens</i>         | 100 | 0.2 | 0.2 | 0.2 |
|                     | MECA2  | <i>Melica californica</i>       | 100 | 0.2 | 0.2 | 0.2 |
|                     | PETR7  | <i>Pentagramma triangularis</i> | 100 | 0.2 | 0.2 | 0.2 |
|                     | SEWA   | <i>Selaginella wallacei</i>     | 100 | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                                 |     |     |     |     |
|                     | 2LICHN | Lichen                          | 100 | 0.2 | 0.2 | 0.2 |
|                     | 2MOSS  | Moss                            | 100 | 0.2 | 0.2 | 0.2 |

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## ***Quercus wislizeni* (tree) Alliance**

### **Interior live oak woodland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus wislizeni* var. *wislizeni* is dominant or co-dominant in the tree canopy with *Aesculus californica*, *Arbutus menziesii*, *Notholithocarpus densiflorus*, *Pinus sabiniana*, *Quercus chrysolepis*, *Quercus douglasii*, and *Quercus kelloggii*.

Stands of this extensive alliance vary from savannas to closed forests, but they commonly form woodlands (Allen-Diaz et al. 2007). There appears to be less genetic variation in *Quercus wislizeni* than in other evergreen oaks in the state (Nixon 2002). The tree form (var. *wislizeni*) is distinguished from the shrub form (var. *frutescens*), but form and height may be only the result of high fire frequencies (White and Sawyer 1995). The species hybridizes with other oaks. The most commonly encountered hybrid is the deciduous *Quercus ×morehus* (*Q. kelloggii* × *Q. wislizeni*).

#### Sonoma County

In addition to comments discussed in the *Quercus parvula* var. *shrevei* description, there is confusion in distinguishing the *Quercus wislizeni* (tree) Alliance from the *Quercus wislizeni* var. *frutescens* (shrub) Alliance. Recent and recurring fires in stands of formerly tree-sized *Quercus wislizeni* give the affected stands a shrubby look, and they are classified under the *Quercus wislizeni* (shrub) Alliance. *Quercus wislizeni* stands may occur immediately adjacent to mesic chaparral stands of *Quercus berberidifolia*, *Cercocarpus montanus*, and shrubby *Aesculus californica*; they are assigned to the *Quercus wislizeni* (tree) Alliance if the individuals are in the tree form in spite of their close proximity to shrub alliances.

The majority of all *Quercus wislizeni* stands sampled in Sonoma County appear to be “tree” stands, as indicated by the standing charred stems of tree height. We treat most *Quercus wislizeni* stands with *Arbutus menziesii* or other typical tree associates as members of the tree version of this alliance.

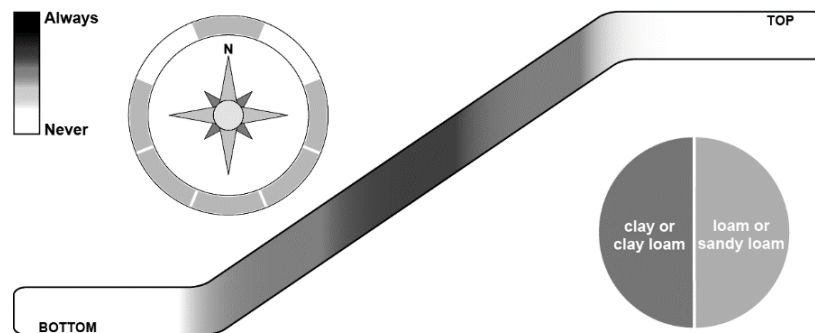
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#### **Local Alliance Summary (n = 8)**

**Elevation:** 368–1083 ft, mean 720 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 48.4         | 35–59         | –          |
| <b>Herb</b>                          | 4.6          | 1–12          | <0.5–0.5   |
| <b>Shrub</b>                         | 11.9         | 1–35          | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 4.0          | 2–10          | <0.5–5     |
| <b>Hardwood</b>                      | 35.4         | 4–46          | 2–15       |
| <b>Conifer</b>                       | 0.7          | 0–4           | 2–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 19.4° | 7–31°  |
| <b>Large rock cover</b>  | 2.1%  | 0–14%  |
| <b>Small rock cover</b>  | 4.3%  | 0–10%  |
| <b>Bare ground cover</b> | 23.4% | 0–70%  |
| <b>Litter cover</b>      | 68.3% | 20–98% |

**Associations within this Alliance:**

*Quercus wislizeni* – *Arbutus menziesii* / *Toxicodendron diversilobum* Association

**STAND TABLE**

***Quercus wislizeni* (tree) Alliance**

n = 8

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            |       |   |     |      |      |      |
|  | QUWI2 | * <i>Quercus wislizeni</i>                          | 88  | 30.9 | 21.0 | 40.0 |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 75  | 3.2  | 0.2  | 12.0 |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 63  | 4.2  | 1.0  | 8.0  |
|  | QUGA4 | <i>Quercus garryana</i>                             | 38  | 6.0  | 3.0  | 12.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 25  | 2.1  | 0.2  | 4.0  |
|  | AECA  | <i>Aesculus californica</i>                         | 25  | 1.5  | 1.0  | 2.0  |
|  | QUCH2 | <i>Quercus chrysolepis</i>                          | 25  | 0.6  | 0.2  | 1.0  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i>                   | 100 | 2.4  | 0.2  | 10.2 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 88  | 1.0  | 0.2  | 3.0  |
|  | ARME  | * <i>Arbutus menziesii</i>                          | 63  | 0.9  | 0.2  | 2.2  |
|  | QUWI2 | * <i>Quercus wislizeni</i>                          | 63  | 0.7  | 0.2  | 2.2  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 88  | 3.4  | 1.0  | 8.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>                           | 75  | 3.4  | 0.2  | 12.0 |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 63  | 0.2  | 0.2  | 0.2  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 38  | 1.5  | 0.2  | 4.0  |
|  | COCOC | <i>Corylus cornuta</i> var. <i>californica</i>      | 25  | 1.6  | 0.2  | 3.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                     | 25  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>                            |       |   |     |      |      |      |
|  | TOAR  | <i>Torilis arvensis</i>                             | 50  | 1.4  | 0.2  | 4.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus wislizeni* (tree) Alliance**

n = 8

| Lifeform     | Code   | Botanical Name                  | Con | Avg  | Min | Max  |
|--------------|--------|---------------------------------|-----|------|-----|------|
| Herb         |        |                                 |     |      |     |      |
|              | PETR7  | <i>Pentagramma triangularis</i> | 50  | 0.2  | 0.2 | 0.2  |
|              | BRMA   | <i>Briza maxima</i>             | 38  | 2.3  | 1.0 | 4.0  |
|              | CYEC   | <i>Cynosurus echinatus</i>      | 38  | 2.3  | 1.0 | 4.0  |
|              | IRIS   | <i>Iris</i>                     | 38  | 0.2  | 0.2 | 0.2  |
|              | METO   | <i>Melica torreyana</i>         | 25  | 1.1  | 0.2 | 2.0  |
|              | ELGL   | <i>Elymus glaucus</i>           | 25  | 0.6  | 0.2 | 1.0  |
|              | CHPO3  | <i>Chlorogalum pomeridianum</i> | 25  | 0.2  | 0.2 | 0.2  |
|              | GALIU  | <i>Galium</i>                   | 25  | 0.2  | 0.2 | 0.2  |
| Non-vascular |        |                                 |     |      |     |      |
|              | 2MOSS  | Moss                            | 63  | 11.1 | 0.2 | 30.0 |
|              | 2LICHN | Lichen                          | 25  | 0.2  | 0.2 | 0.2  |

***Quercus wislizeni* – *Arbutus menziesii* / *Toxicodendron diversilobum*  
Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (4), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 50.3         | 40–59         | –          |
| <b>Herb</b>                          | 3.6          | 1–8           | <0.5–0.5   |
| <b>Shrub</b>                         | 13.4         | 3–35          | 1–5        |
| <b>Regenerating/understory tree*</b> | 4.3          | 2–10          | <0.5–5     |
| <b>Hardwood</b>                      | 36.1         | 4–46          | 2–15       |
| <b>Conifer</b>                       | 0.8          | 0–4           | 2–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SE (2), SW (2), variable (2)

**Macrotopography:** lower to upper 1/3 of slope (2), middle 1/3 of slope (3), middle to upper 1/3 of slope (2)

**Microtopography:** concave (1), convex (1), flat (2), undulating (3)

**Parent material:** Franciscan melange (2), metamorphic (1), rhyolite (1), sandstone (2), sedimentary (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1)

**Slope steepness:** moderate/6–25° (5), steep/>25° (2)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 748 ft. | 368–1083 ft. |
| <b>Slope</b>             | 21.0°   | 7–31°        |
| <b>Large rock cover</b>  | 0.4%    | 0–2%         |
| <b>Small rock cover</b>  | 4.5%    | 0–10%        |
| <b>Bare ground cover</b> | 26.4%   | 0–70%        |
| <b>Litter cover</b>      | 66.7%   | 20–98%       |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** SONO0072, SONO0165, SONO0314, SONO0590, SONO0818, SONO0845, SONO0863

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Quercus wislizeni* – *Arbutus menziesii* / *Toxicodendron diversilobum* Association**

n = 7

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                               | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>                            |             |   |            |            |            |            |
|  | QUWI2       | * <i>Quercus wislizeni</i>                          | 86         | 32.5       | 25.0       | 40.0       |
|  | ARME        | * <i>Arbutus menziesii</i>                          | 86         | 3.2        | 0.2        | 12.0       |
|  | UMCA        | * <i>Umbellularia californica</i>                   | 57         | 4.8        | 1.0        | 8.0        |
|  | QUGA4       | <i>Quercus garryana</i>                             | 29         | 7.5        | 3.0        | 12.0       |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                      | 29         | 2.1        | 0.2        | 4.0        |
|  | QUCH2       | <i>Quercus chrysolepis</i>                          | 29         | 0.6        | 0.2        | 1.0        |
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | UMCA        | * <i>Umbellularia californica</i>                   | 100        | 2.7        | 0.2        | 10.2       |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                      | 86         | 1.2        | 0.2        | 3.0        |
|  | ARME        | * <i>Arbutus menziesii</i>                          | 71         | 0.9        | 0.2        | 2.2        |
|  | QUWI2       | * <i>Quercus wislizeni</i>                          | 57         | 0.8        | 0.2        | 2.2        |
| <b>Shrub</b>                           |             |   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i>                   | 86         | 3.8        | 1.0        | 8.0        |
|  | LOHI2       | <i>Lonicera hispidula</i>                           | 86         | 3.4        | 0.2        | 12.0       |
|  | DIAUA       | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 71         | 0.2        | 0.2        | 0.2        |
|  | HEAR5       | <i>Heteromeles arbutifolia</i>                      | 43         | 1.5        | 0.2        | 4.0        |
|  | COCOC       | <i>Corylus cornuta</i> var. <i>californica</i>      | 29         | 1.6        | 0.2        | 3.0        |
|  | ARMA        | <i>Arctostaphylos manzanita</i>                     | 29         | 0.6        | 0.2        | 1.0        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | PETR7       | <i>Pentagramma triangularis</i>                     | 57         | 0.2        | 0.2        | 0.2        |
|  | TOAR        | <i>Torilis arvensis</i>                             | 43         | 1.7        | 0.2        | 4.0        |
|  | IRIS        | <i>Iris</i>   | 43         | 0.2        | 0.2        | 0.2        |
|  | BRMA        | <i>Briza maxima</i>                                 | 29         | 1.5        | 1.0        | 2.0        |
|  | CYEC        | <i>Cynosurus echinatus</i>                          | 29         | 1.5        | 1.0        | 2.0        |
|  | METO        | <i>Melica torreyana</i>                             | 29         | 1.1        | 0.2        | 2.0        |
|  | ELGL        | <i>Elymus glaucus</i>                               | 29         | 0.6        | 0.2        | 1.0        |
| <b>Non-vascular</b>                    |             |   |            |            |            |            |
|  | 2MOSS       | Moss  | 57         | 13.9       | 0.2        | 30.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Salix laevigata Alliance**  
**Red willow thickets**

Statewide (Sawyer et al. 2009)

*Salix laevigata* is dominant or co-dominant in the tree or shrub canopy with *Acer negundo*, *Aesculus californica*, *Alnus rhombifolia*, *Calocedrus decurrens*, *Pinus jeffreyi*, *Pinus sabiniana*, *Platanus racemosa*, *Populus fremontii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Salix gooddingii*, *Salix lasiolepis*, *Salix lucida* ssp. *lasiandra*, and *Sambucus nigra*.

*Salix laevigata* commonly grows with various willows and other riparian trees, but it can dominate sites. Researchers have generally placed mixed associations that include *Salix laevigata* in the *Alnus rhombifolia*, *Populus fremontii*, *Quercus agrifolia*, and *Salix gooddingii* Alliances. Many of the associations in the *Salix laevigata* Alliance include *Salix lasiolepis*.

Sonoma County

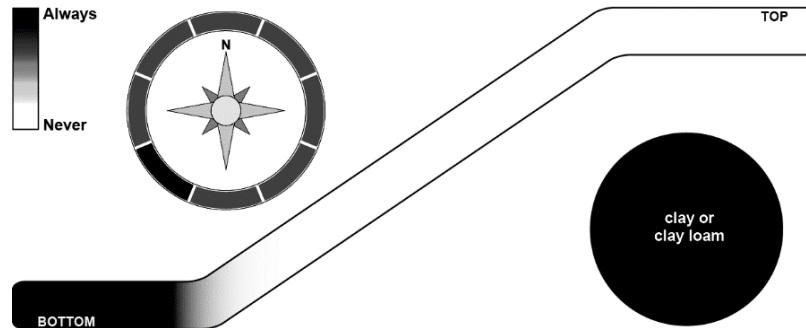
*Salix laevigata* stands in Sonoma County are associated with larger creeks, rivers or persistent ponds.

**Local Alliance Summary (n = 5)**

**Elevation:** 138–552 ft, mean 329 ft

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.6         | 30–97         | –          |
| <b>Herb</b>                          | 3.0          | 0–12          | <0.5–2     |
| <b>Shrub</b>                         | 33.6         | 10–95         | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 15.4         | 0–50          | 2–10       |
| <b>Hardwood</b>                      | 19.2         | 3–35          | 2–35       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 1.6°  | 0–5°   |
| Large rock cover  | 0.9%  | 0–3%   |
| Small rock cover  | 34.9% | 0–80%  |
| Bare ground cover | 25.2% | 15–48% |
| Litter cover      | 35.6% | 5–80%  |

**Associations within this Alliance:**

*Salix laevigata* / *Salix lasiolepis* Provisional Association

**STAND TABLE**

***Salix laevigata* Alliance**

n = 5

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | SALA3 | * <i>Salix laevigata</i>          | 60  | 22.3 | 13.0 | 30.0 |
|  | ALRH2 | * <i>Alnus rhombifolia</i>        | 40  | 3.5  | 3.0  | 4.0  |
|  | EUCAL | <i>Eucalyptus</i>                 | 20  | 17.0 | 17.0 | 17.0 |
|  | QUAG  | <i>Quercus agrifolia</i>          | 20  | 5.0  | 5.0  | 5.0  |
|  | POFR2 | * <i>Populus fremontii</i>        | 20  | 1.0  | 1.0  | 1.0  |
|  | UMCA  | <i>Umbellularia californica</i>   | 20  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | SALA3 | * <i>Salix laevigata</i>          | 60  | 21.7 | 8.0  | 40.0 |
|  | ALRH2 | * <i>Alnus rhombifolia</i>        | 60  | 4.7  | 2.0  | 7.0  |
|  | POFR2 | * <i>Populus fremontii</i>        | 20  | 10.0 | 10.0 | 10.0 |
|  | ARME  | <i>Arbutus menziesii</i>          | 20  | 1.0  | 1.0  | 1.0  |
|  | FRLA  | <i>Fraxinus latifolia</i>         | 20  | 1.0  | 1.0  | 1.0  |
|  | ACNE2 | <i>Acer negundo</i>               | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | SALA6 | <i>Salix lasiolepis</i>           | 80  | 13.3 | 1.0  | 25.0 |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 80  | 9.3  | 0.2  | 28.0 |
|  | SAEX  | <i>Salix exigua</i>               | 40  | 8.5  | 5.0  | 12.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 40  | 0.6  | 0.2  | 1.0  |
|  | RUUR  | <i>Rubus ursinus</i>              | 20  | 75.0 | 75.0 | 75.0 |
|  | SASC  | <i>Salix scouleriana</i>          | 20  | 2.0  | 2.0  | 2.0  |
|  | VICA5 | <i>Vitis californica</i>          | 20  | 2.0  | 2.0  | 2.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 20  | 0.2  | 0.2  | 0.2  |
|  | GEMO2 | <i>Genista monspessulana</i>      | 20  | 0.2  | 0.2  | 0.2  |
|  | HODI  | <i>Holodiscus discolor</i>        | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | HEOR2 | <i>Heterotheca oregona</i>        | 40  | 3.0  | 3.0  | 3.0  |
|  | ARDO3 | <i>Artemisia douglasiana</i>      | 40  | 1.6  | 0.2  | 3.0  |
|  | BRDI3 | <i>Bromus diandrus</i>            | 40  | 0.2  | 0.2  | 0.2  |
|  | CAPY2 | <i>Carduus pycnocephalus</i>      | 40  | 0.2  | 0.2  | 0.2  |
|  | XAST  | <i>Xanthium strumarium</i>        | 20  | 3.0  | 3.0  | 3.0  |
|  | BASA4 | <i>Baccharis salicifolia</i>      | 20  | 1.0  | 1.0  | 1.0  |
|  | BRMA  | <i>Briza maxima</i>               | 20  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Salix laevigata* Alliance**

n = 5

| Lifeform            | Code   | Botanical Name                | Con | Avg | Min | Max |
|---------------------|--------|-------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |        |                               |     |     |     |     |
|                     | CRSE11 | <i>Croton setigerus</i>       | 20  | 1.0 | 1.0 | 1.0 |
|                     | CYDA   | <i>Cynodon dactylon</i>       | 20  | 1.0 | 1.0 | 1.0 |
|                     | PHAQ   | <i>Phalaris aquatica</i>      | 20  | 1.0 | 1.0 | 1.0 |
|                     | AVBA   | <i>Avena barbata</i>          | 20  | 0.2 | 0.2 | 0.2 |
|                     | BRNI   | <i>Brassica nigra</i>         | 20  | 0.2 | 0.2 | 0.2 |
|                     | EPILO  | <i>Epilobium</i>              | 20  | 0.2 | 0.2 | 0.2 |
|                     | EPBR3  | <i>Epilobium brachycarpum</i> | 20  | 0.2 | 0.2 | 0.2 |
|                     | EQUIS  | <i>Equisetum</i>              | 20  | 0.2 | 0.2 | 0.2 |
|                     | HIIN3  | <i>Hirschfeldia incana</i>    | 20  | 0.2 | 0.2 | 0.2 |
|                     | JUPA2  | <i>Juncus patens</i>          | 20  | 0.2 | 0.2 | 0.2 |
|                     | PLLA   | <i>Plantago lanceolata</i>    | 20  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                               |     |     |     |     |
|                     | 2MOSS  | Moss                          | 40  | 0.2 | 0.2 | 0.2 |

***Salix laevigata* / *Salix lasiolepis* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2), Coastal Franciscan/263Ag (2), and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.6         | 30–97         | –          |
| <b>Herb</b>                          | 3.0          | 0–12          | <0.5–2     |
| <b>Shrub</b>                         | 33.6         | 10–95         | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 15.4         | 0–50          | 2–10       |
| <b>Hardwood</b>                      | 19.2         | 3–35          | 2–35       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), SW (1), variable (1)

**Macrotopography:** bottom (5)

**Microtopography:** concave (3), flat (1), undulating (1)

**Parent material:** Franciscan melange (2), mixed alluvium (1), sandstone (1), silty alluvium (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (3)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 329 ft. | 138–552 ft. |
| <b>Slope</b>             | 1.6°    | 0–5°        |
| <b>Large rock cover</b>  | 0.9%    | 0–3%        |
| <b>Small rock cover</b>  | 34.9%   | 0–80%       |
| <b>Bare ground cover</b> | 25.2%   | 15–48%      |
| <b>Litter cover</b>      | 35.6%   | 5–80%       |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0332, SONO0588, SONO0600, SONO0675, SONO0961

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Salix laevigata* / *Salix lasiolepis* Association**

n = 5

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Tree</b>                            |             |                                   |            |            |            |            |
|  | SALA3       | * <i>Salix laevigata</i>          | 60         | 22.3       | 13.0       | 30.0       |
|  | ALRH2       | * <i>Alnus rhombifolia</i>        | 40         | 3.5        | 3.0        | 4.0        |
|  | EUCAL       | <i>Eucalyptus</i>                 | 20         | 17.0       | 17.0       | 17.0       |
|  | QUAG        | <i>Quercus agrifolia</i>          | 20         | 5.0        | 5.0        | 5.0        |
|  | POFR2       | * <i>Populus fremontii</i>        | 20         | 1.0        | 1.0        | 1.0        |
|  | UMCA        | <i>Umbellularia californica</i>   | 20         | 0.2        | 0.2        | 0.2        |
| <b>Regenerating or Understory Tree</b> |             |                                   |            |            |            |            |
|  | SALA3       | * <i>Salix laevigata</i>          | 60         | 21.7       | 8.0        | 40.0       |
|  | ALRH2       | * <i>Alnus rhombifolia</i>        | 60         | 4.7        | 2.0        | 7.0        |
|  | POFR2       | * <i>Populus fremontii</i>        | 20         | 10.0       | 10.0       | 10.0       |
|  | FRLA        | <i>Fraxinus latifolia</i>         | 20         | 1.0        | 1.0        | 1.0        |
|  | ARME        | <i>Arbutus menziesii</i>          | 20         | 1.0        | 1.0        | 1.0        |
|  | ACNE2       | <i>Acer negundo</i>               | 20         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |                                   |            |            |            |            |
|  | SALA6       | <i>Salix lasiolepis</i>           | 80         | 13.3       | 1.0        | 25.0       |
|  | RUAR9       | <i>Rubus armeniacus</i>           | 80         | 9.3        | 0.2        | 28.0       |
|  | SAEX        | <i>Salix exigua</i>               | 40         | 8.5        | 5.0        | 12.0       |
|  | TODI        | <i>Toxicodendron diversilobum</i> | 40         | 0.6        | 0.2        | 1.0        |
|  | RUUR        | <i>Rubus ursinus</i>              | 20         | 75.0       | 75.0       | 75.0       |
|  | SASC        | <i>Salix scouleriana</i>          | 20         | 2.0        | 2.0        | 2.0        |
|  | VICA5       | <i>Vitis californica</i>          | 20         | 2.0        | 2.0        | 2.0        |
|  | HODI        | <i>Holodiscus discolor</i>        | 20         | 0.2        | 0.2        | 0.2        |
|  | BAPI        | <i>Baccharis pilularis</i>        | 20         | 0.2        | 0.2        | 0.2        |
|  | GEMO2       | <i>Genista monspessulana</i>      | 20         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |                                   |            |            |            |            |
|  | HEOR2       | <i>Heterotheca oregona</i>        | 40         | 3.0        | 3.0        | 3.0        |
|  | ARDO3       | <i>Artemisia douglasiana</i>      | 40         | 1.6        | 0.2        | 3.0        |
|  | BRDI3       | <i>Bromus diandrus</i>            | 40         | 0.2        | 0.2        | 0.2        |
|  | CAPY2       | <i>Carduus pycnocephalus</i>      | 40         | 0.2        | 0.2        | 0.2        |
|  | XAST        | <i>Xanthium strumarium</i>        | 20         | 3.0        | 3.0        | 3.0        |
|  | BASA4       | <i>Baccharis salicifolia</i>      | 20         | 1.0        | 1.0        | 1.0        |
|  | BRMA        | <i>Briza maxima</i>               | 20         | 1.0        | 1.0        | 1.0        |
|  | CRSE11      | <i>Croton setigerus</i>           | 20         | 1.0        | 1.0        | 1.0        |
|  | CYDA        | <i>Cynodon dactylon</i>           | 20         | 1.0        | 1.0        | 1.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Salix laevigata* / *Salix lasiolepis* Association**

n = 5

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>         | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|-------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                               |            |            |            |            |
|                     | PHAQ        | <i>Phalaris aquatica</i>      | 20         | 1.0        | 1.0        | 1.0        |
|                     | HIIN3       | <i>Hirschfeldia incana</i>    | 20         | 0.2        | 0.2        | 0.2        |
|                     | AVBA        | <i>Avena barbata</i>          | 20         | 0.2        | 0.2        | 0.2        |
|                     | JUPA2       | <i>Juncus patens</i>          | 20         | 0.2        | 0.2        | 0.2        |
|                     | PLLA        | <i>Plantago lanceolata</i>    | 20         | 0.2        | 0.2        | 0.2        |
|                     | EPBR3       | <i>Epilobium brachycarpum</i> | 20         | 0.2        | 0.2        | 0.2        |
|                     | BRNI        | <i>Brassica nigra</i>         | 20         | 0.2        | 0.2        | 0.2        |
|                     | EPILO       | <i>Epilobium</i>              | 20         | 0.2        | 0.2        | 0.2        |
|                     | EQUIS       | <i>Equisetum</i>              | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                               |            |            |            |            |
|                     | 2MOSS       | Moss                          | 40         | 0.2        | 0.2        | 0.2        |



**Salix lucida Alliance**  
**Shining willow groves**

Statewide (Sawyer et al. 2009)

*Salix lucida* is dominant or co-dominant in the tree or shrub canopy with *Acer macrophyllum*, *Alnus rhombifolia*, *Cornus sericea*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Quercus agrifolia*, *Salix* spp., and *Sambucus nigra*.

In California, *Salix lucida* stands appear to be limited to relatively moist coastal areas, permanently flooded bottomlands, saturated montane meadows, or along low-gradient streams. Disturbances during winter floods modify stands; the timing of seed dispersal and spring flood patterns determine seedling success. There are two subspecies of *Salix lucida*: *S. lucida* ssp. *lasiandra*, which is usually a tree, and *S. lucida* ssp. *caudata*, a montane shrub. Only *Salix lucida* ssp. *lasiandra* is included in this alliance.

Sonoma County

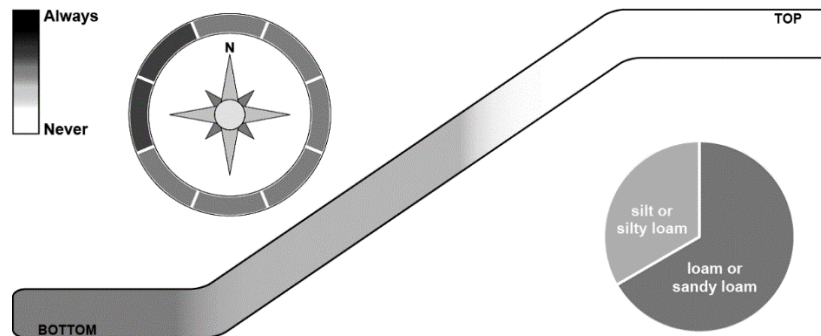
*Salix lucida* stands in Sonoma County are associated with permanently moist shores of swamps, rivers, creeks, lagoons, or ponds. Some stands also occur adjacent to fens.

**Local Alliance Summary (n = 6)**

**Elevation:** 57–550 ft, mean 228 ft

**SCV Global/State Rank:** G4/S3<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 72.5         | 50–90         | –          |
| <b>Herb</b>                          | 18.8         | 3–47          | <0.5–2     |
| <b>Shrub</b>                         | 34.0         | 0–75          | 1–5        |
| <b>Regenerating/understory tree*</b> | 4.4          | 0.2–10        | <0.5–5     |
| <b>Hardwood</b>                      | 39.0         | 17–50         | 2–15       |
| <b>Conifer</b>                       | 0.2          | 0–1           | 5–10       |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 4.2°  | 0–20° |
| Large rock cover  | 0.2%  | 0–1%  |
| Small rock cover  | 3.2%  | 0–12% |
| Bare ground cover | 21.5% | 0–40% |
| Litter cover      | 48.2% | 0–69% |

**Associations within this Alliance:**

*Salix lucida* ssp. *lasiandra* Provisional Association

**STAND TABLE**

***Salix lucida* Alliance**

n = 6

| Lifeform                               | Code   | Botanical Name                              | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | SALUL  | * <i>Salix lucida</i> ssp. <i>lasiandra</i> | 100 | 28.7 | 15.0 | 40.0 |
|  | ALRH2  | <i>Alnus rhombifolia</i>                    | 33  | 30.0 | 20.0 | 40.0 |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | SALUL  | * <i>Salix lucida</i> ssp. <i>lasiandra</i> | 67  | 5.0  | 2.0  | 10.0 |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>                        | 50  | 24.3 | 1.0  | 60.0 |
|  | RUAR9  | <i>Rubus armeniacus</i>                     | 33  | 37.5 | 10.0 | 65.0 |
|  | SALA6  | <i>Salix lasiolepis</i>                     | 33  | 12.5 | 7.0  | 18.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>           | 33  | 7.6  | 0.2  | 15.0 |
|  | VICA5  | <i>Vitis californica</i>                    | 33  | 5.0  | 5.0  | 5.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | XAST   | <i>Xanthium strumarium</i>                  | 50  | 0.8  | 0.2  | 2.0  |
|  | TYLA   | <i>Typha latifolia</i>                      | 33  | 5.0  | 3.0  | 7.0  |
|  | MEPU   | <i>Mentha pulegium</i>                      | 33  | 1.1  | 0.2  | 2.0  |
|  | COMA2  | <i>Conium maculatum</i>                     | 33  | 0.6  | 0.2  | 1.0  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 33  | 2.6  | 0.2  | 5.0  |
|  | 2LICHN | Lichen                                      | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Salix lucida* ssp. *lasiandra* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 72.5         | 50–90         | –          |
| Herb             | 18.8         | 3–47          | <0.5–2     |
| Shrub            | 34.0         | 0–75          | 1–5        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 4.4          | 0.2–10        | <0.5–5     |
| <b>Hardwood</b>                      | 39.0         | 17–50         | 2–15       |
| <b>Conifer</b>                       | 0.2          | 0–1           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), NW (2), variable (2)

**Macrotopography:** bottom (3), lower 1/3 of slope (2), middle 1/3 of slope (1)

**Microtopography:** concave (1), convex (1), flat (3), undulating (1)

**Parent material:** mixed alluvium (1), sandstone (1), sandy alluvium (1), sedimentary (2), silty alluvium (1)

**Soil texture:** loam or sandy loam (2), silt or silt loam (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (3), moderate/6-25° (1)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 228 ft. | 57–550 ft. |
| <b>Slope</b>             | 4.2°    | 0–20°      |
| <b>Large rock cover</b>  | 0.2%    | 0–1%       |
| <b>Small rock cover</b>  | 3.2%    | 0–12%      |
| <b>Bare ground cover</b> | 21.5%   | 0–40%      |
| <b>Litter cover</b>      | 48.2%   | 0–69%      |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0190, SONO0400, SONO0622, SONO0803, SONO0815, SONO0825

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Salix lucida* ssp. *lasiandra* Association**

n = 6

| Lifeform                               | Code  | Botanical Name                              | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            | SALUL | * <i>Salix lucida</i> ssp. <i>lasiandra</i> | 100 | 28.7 | 15.0 | 40.0 |
|  | ALRH2 | <i>Alnus rhombifolia</i>                    | 33  | 30.0 | 20.0 | 40.0 |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | SALUL | * <i>Salix lucida</i> ssp. <i>lasiandra</i> | 67  | 5.0  | 2.0  | 10.0 |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | RUUR  | <i>Rubus ursinus</i>                        | 50  | 24.3 | 1.0  | 60.0 |
|  | RUAR9 | <i>Rubus armeniacus</i>                     | 33  | 37.5 | 10.0 | 65.0 |
|  | SALA6 | <i>Salix lasiolepis</i>                     | 33  | 12.5 | 7.0  | 18.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i>           | 33  | 7.6  | 0.2  | 15.0 |
|  | VICA5 | <i>Vitis californica</i>                    | 33  | 5.0  | 5.0  | 5.0  |
| <b>Herb</b>                            |       |   |     |      |      |      |
|  | XAST  | <i>Xanthium strumarium</i>                  | 50  | 0.8  | 0.2  | 2.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Salix lucida* ssp. *lasiandra* Association**

n = 6

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>   | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|-------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                         |            |            |            |            |
|                     | TYLA        | <i>Typha latifolia</i>  | 33         | 5.0        | 3.0        | 7.0        |
|                     | MEPU        | <i>Mentha pulegium</i>  | 33         | 1.1        | 0.2        | 2.0        |
|                     | COMA2       | <i>Conium maculatum</i> | 33         | 0.6        | 0.2        | 1.0        |
| <b>Non-vascular</b> |             |                         |            |            |            |            |
|                     | 2MOSS       | Moss                    | 33         | 2.6        | 0.2        | 5.0        |
|                     | 2LICHN      | Lichen                  | 33         | 0.2        | 0.2        | 0.2        |

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## ***Sequoia sempervirens* Alliance**

### **Redwood forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Sequoia sempervirens* is dominant or co-dominant in the tree canopy with *Abies grandis*, *Acer macrophyllum*, *Alnus rubra*, *Arbutus menziesii*, *Chrysolepis chrysophylla*, *Notholithocarpus densiflorus*, *Picea sitchensis*, *Pseudotsuga menziesii*, *Tsuga heterophylla*, and *Umbellularia californica*.

*Sequoia sempervirens* occurs in moist coastal areas with heavy summer fog. Stands generally occur below 600 meters in elevation, from southern Oregon to the Santa Lucia Mountains in central California. Scattered stands also occur along streams, springs, seeps, and sheltered moist locations up to about 975 meters elevation, where they usually occur as mixed hardwood forests (Sawyer 2006, 2007). *Sequoia sempervirens* is probably limited in its northern extent by freezing temperatures and in its southern extent by low winter rainfall (Lanner 1999).

Ecologists differentiate forests on alluvial streamside terraces, where *Sequoia sempervirens* is usually the dominant canopy tree, from those in upland settings, where *Sequoia sempervirens* shares the canopy with other conifers and with hardwood trees (NatureServe 2007a). However, these differences are best understood when the associations are placed in three geographic regions (Sawyer et al. 2000b). *Tsuga heterophylla* plays an important role in the northern forest region, and it is absent from the other two regions, where *Notholithocarpus densiflorus* plays an important role. Additionally, redwood genetics in the southern forest region differs from that in the other regions (Sawyer et al. 2000a, b). Precipitation varies significantly between northern and southern regions with fog-drip playing an increasingly important role in the southern portion of the range (Olsen et al. 1990).

### Sonoma County

*Sequoia sempervirens* stands in Sonoma County are represented by seven associations, varying from riparian habitats and river terraces to mid- and upper-slope positions.

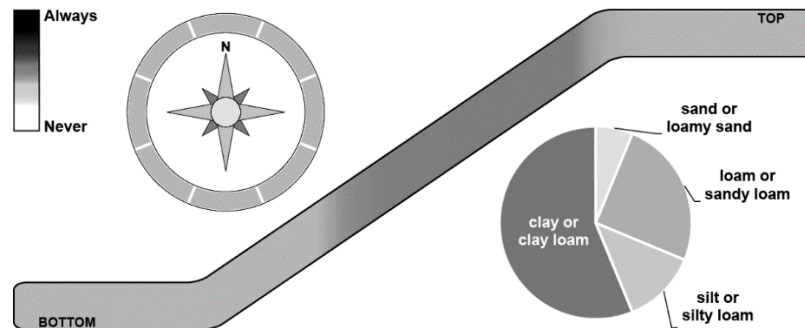
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### **Local Alliance Summary (n = 59)**

**Elevation:** 38–1605 ft, mean 654 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 69.1         | 30–99         | –          |
| <b>Herb</b>                          | 10.3         | 0–75          | <0.5–2     |
| <b>Shrub</b>                         | 5.5          | 0–46          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 9.8          | 0–50          | <0.5–20    |
| <b>Hardwood</b>                      | 13.4         | 0–40          | 5–50       |
| <b>Conifer</b>                       | 47.5         | 1–85          | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.3° | 0–38°  |
| <b>Large rock cover</b>  | 0.5%  | 0–10%  |
| <b>Small rock cover</b>  | 3.0%  | 0–63%  |
| <b>Bare ground cover</b> | 6.5%  | 0–45%  |
| <b>Litter cover</b>      | 87.2% | 20–98% |

**Associations within this Alliance:**

- Sequoia sempervirens* – *Acer macrophyllum* – *Umbellularia californica* Association
- Sequoia sempervirens* – *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association
- Sequoia sempervirens* – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Provisional Association
- Sequoia sempervirens* – *Pseudotsuga menziesii* – *Umbellularia californica* Association
- Sequoia sempervirens* – *Umbellularia californica* Association
- Sequoia sempervirens* / *Oxalis oregana* Association
- Sequoia sempervirens* / *Woodwardia fimbriata* Riparian Provisional Association

**STAND TABLE**

***Sequoia sempervirens* Alliance**

n = 59

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min | Max  |
|--|-------|---------------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                       |     |      |     |      |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 100 | 38.3 | 6.0 | 80.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 66  | 11.7 | 1.0 | 45.0 |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 64  | 9.9  | 0.2 | 40.0 |
|  | UMCA  | * <i>Umbellularia californica</i>     | 63  | 6.3  | 0.2 | 28.0 |
|  | ACMA3 | <i>Acer macrophyllum</i>              | 22  | 5.2  | 0.2 | 12.0 |
|  | ARME  | <i>Arbutus menziesii</i>              | 22  | 4.7  | 0.2 | 16.0 |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |     |      |
|  | SESE3 | * <i>Sequoia sempervirens</i>         | 92  | 3.5  | 0.2 | 20.2 |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 73  | 6.0  | 0.1 | 40.2 |
|  | UMCA  | * <i>Umbellularia californica</i>     | 53  | 1.8  | 0.2 | 5.2  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 46  | 2.1  | 0.2 | 10.2 |
| <b>Shrub</b>                           |       |                                       |     |      |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>     | 49  | 1.1  | 0.1 | 7.0  |
|  | VAOV2 | <i>Vaccinium ovatum</i>               | 39  | 5.1  | 0.2 | 36.0 |
|  | LOHI2 | <i>Lonicera hispidula</i>             | 32  | 0.4  | 0.1 | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Sequoia sempervirens* Alliance**

n = 59

| Lifeform     | Code   | Botanical Name                                   | Con | Avg | Min | Max  |
|--------------|--------|--|-----|-----|-----|------|
| Shrub        | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>   | 29  | 1.6 | 0.2 | 7.0  |
|              | RUUR   | <i>Rubus ursinus</i>                             | 22  | 1.3 | 0.2 | 5.0  |
| Herb         | POMU   | <i>Polystichum munitum</i>                       | 76  | 5.4 | 0.2 | 46.0 |
|              | PRHO2  | <i>Prosartes hookeri</i>                         | 34  | 0.5 | 0.2 | 4.0  |
|              | OXOR   | <i>Oxalis oregana</i>                            | 32  | 8.8 | 0.2 | 40.0 |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 31  | 0.9 | 0.2 | 6.0  |
|              | ATFI   | <i>Athyrium filix-femina</i>                     | 29  | 0.7 | 0.2 | 3.0  |
|              | CAREX  | <i>Carex</i>                                     | 27  | 0.4 | 0.2 | 1.0  |
|              | TRBOL  | <i>Trientalis borealis</i> ssp. <i>latifolia</i> | 24  | 0.7 | 0.2 | 5.0  |
|              | DRAR3  | <i>Dryopteris arguta</i>                         | 20  | 0.9 | 0.2 | 7.0  |
|              | TROV2  | <i>Trillium ovatum</i>                           | 20  | 0.3 | 0.2 | 1.0  |
| Non-vascular | 2MOSS  | Moss   | 78  | 2.6 | 0.2 | 15.0 |

***Sequoia sempervirens* – *Acer macrophyllum* – *Umbellularia californica*  
Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) and Mount St. Helena Flows and Valleys/263Am (4) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 64.1         | 47–85         | –          |
| Herb                          | 8.2          | 2–16          | <0.5–2     |
| Shrub                         | 2.6          | 0–10          | <0.5–5     |
| Regenerating/understory tree* | 6.3          | 2–14          | 1–10       |
| Hardwood                      | 14.6         | 5–25          | 5–35       |
| Conifer                       | 46.6         | 32–70         | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (3), SE (2), SW (1), variable (1)

**Macrotopography:** bottom (2), lower 1/3 of slope (2), lower to middle 1/3 of slope (1), middle 1/3 of slope (4)

**Microtopography:** concave (6), flat (1), undulating (2)

**Parent material:** Franciscan melange (4), metasedimentary (1), sandstone (1), volcanic (3)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (1), steep/>25° (5)

|                  | Mean    | Range       |
|------------------|---------|-------------|
| Elevation        | 627 ft. | 92–1168 ft. |
| Slope            | 22.4°   | 2–38°       |
| Large rock cover | 0.1%    | 0–1%        |
| Small rock cover | 0.6%    | 0–3%        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Bare ground cover | 3.9%  | 0–15%  |
| Litter cover      | 92.5% | 80–98% |

**Samples Used to Describe Association (n=9)**

**Rapid Assessments:** SONO0151, SONO0315, SONO0541, SONO0849, SONO0866, SONO0998

**Relevés:** SONO0018, SONO0256, SONO2194

SCV Global/State Rank: G3?/S3?¹

**STAND TABLE**

***Sequoia sempervirens* – *Acer macrophyllum* – *Umbellularia californica* Association**

n = 9

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 100 | 44.0 | 22.0 | 70.0 |
|  | ACMA3  | * <i>Acer macrophyllum</i>                       | 100 | 6.0  | 1.0  | 12.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 78  | 9.6  | 1.0  | 18.0 |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 67  | 2.2  | 0.2  | 6.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 44  | 6.0  | 2.0  | 14.0 |
|  | ARME   | <i>Arbutus menziesii</i>                         | 33  | 2.4  | 0.2  | 5.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 100 | 2.4  | 0.2  | 7.2  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 78  | 2.5  | 0.2  | 13.2 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 67  | 1.3  | 0.2  | 4.2  |
|  | ACMA3  | * <i>Acer macrophyllum</i>                       | 56  | 0.4  | 0.2  | 1.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 33  | 0.6  | 0.4  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 56  | 0.4  | 0.2  | 1.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>   | 44  | 2.4  | 0.2  | 7.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 44  | 0.4  | 0.2  | 1.0  |
|  | CAOC5  | <i>Calycanthus occidentalis</i>                  | 22  | 1.1  | 0.2  | 2.0  |
|  | RUUR   | <i>Rubus ursinus</i>                             | 22  | 1.1  | 0.2  | 2.0  |
|  | RUPA   | <i>Rubus parviflorus</i>                         | 22  | 0.6  | 0.2  | 1.0  |
|  | ROGY   | <i>Rosa gymnocarpa</i>                           | 22  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>                       | 67  | 1.9  | 0.2  | 8.0  |
|  | PRHO2  | <i>Prosartes hookeri</i>                         | 56  | 0.6  | 0.2  | 2.0  |
|  | OXOR   | <i>Oxalis oregana</i>                            | 44  | 5.1  | 0.2  | 10.0 |
|  | ATFI   | <i>Athyrium filix-femina</i>                     | 44  | 0.4  | 0.2  | 1.0  |
|  | CAREX  | <i>Carex</i>                                     | 44  | 0.4  | 0.2  | 1.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33  | 0.2  | 0.2  | 0.2  |
|  | TRBOL  | <i>Trientalis borealis</i> ssp. <i>latifolia</i> | 33  | 0.2  | 0.2  | 0.2  |
|  | POCA25 | <i>Polystichum californicum</i>                  | 22  | 1.6  | 0.2  | 3.0  |
|  | TRILL  | <i>Trillium</i>                                  | 22  | 1.1  | 0.2  | 2.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

***Sequoia sempervirens* – *Acer macrophyllum* – *Umbellularia californica* Association**

n = 9

| Lifeform            | Code  | Botanical Name               | Con | Avg | Min | Max |
|---------------------|-------|------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |       |                              |     |     |     |     |
|                     | HEHE  | <i>Hedera helix</i>          | 22  | 0.6 | 0.2 | 1.0 |
|                     | ADBI  | <i>Adenocaulon bicolor</i>   | 22  | 0.2 | 0.2 | 0.2 |
|                     | GALIU | <i>Galium</i>                | 22  | 0.2 | 0.2 | 0.2 |
|                     | GAAP2 | <i>Galium aparine</i>        | 22  | 0.2 | 0.2 | 0.2 |
|                     | TROV2 | <i>Trillium ovatum</i>       | 22  | 0.2 | 0.2 | 0.2 |
|                     | EPHE  | <i>Epipactis helleborine</i> | 22  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |       |                              |     |     |     |     |
|                     | 2MOSS | Moss                         | 78  | 1.9 | 0.2 | 5.0 |

***Sequoia sempervirens* – *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (10) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.9         | 35–90         | –          |
| <b>Herb</b>                          | 15.7         | 0–75          | <0.5–2     |
| <b>Shrub</b>                         | 3.5          | 0–14          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 15.6         | 3–50          | <0.5–20    |
| <b>Hardwood</b>                      | 16.0         | 3–40          | 10–35      |
| <b>Conifer</b>                       | 42.9         | 12–70         | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (4), NW (2), SE (1), SW (2), variable (2)

**Macrotopography:** bottom (1), bottom to mid 1/3 of slope (1), bottom to upper 1/3 of slope (1), entire slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (2), middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (3)

**Microtopography:** concave (3), convex (3), undulating (4)

**Parent material:** blue schist (1), Franciscan melange (4), gravelly alluvium (1), sandstone (4), volcanic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (8), steep/>25° (2)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 547 ft. | 97–1289 ft. |
| <b>Slope</b>             | 18.3°   | 5–35°       |
| <b>Large rock cover</b>  | 0.0%    | 0–0%        |
| <b>Small rock cover</b>  | 0.5%    | 0–4%        |
| <b>Bare ground cover</b> | 2.0%    | 0–6%        |
| <b>Litter cover</b>      | 94.7%   | 88–97%      |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** SONO0100, SONO0389, SONO0627, SONO0712, SONO0968, SONO0972, SONO0978, SONO0992, SONO2191

**Relevés:** SONO0257, SONO2196

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Sequoia sempervirens* – *Notholithocarpus densiflorus* / *Vaccinium ovatum* Association**

n = 11

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            |             |  |            |            |            |            |
|  | SESE3       | * <i>Sequoia sempervirens</i>                    | 100        | 37.5       | 12.0       | 68.0       |
|  | NODE3       | * <i>Notholithocarpus densiflorus</i>            | 91         | 13.8       | 3.0        | 40.0       |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                   | 55         | 1.8        | 1.0        | 4.0        |
|  | UMCA        | * <i>Umbellularia californica</i>                | 45         | 2.4        | 0.2        | 5.0        |
|  | ARME        | <i>Arbutus menziesii</i>                         | 27         | 4.4        | 0.2        | 10.0       |
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | SESE3       | * <i>Sequoia sempervirens</i>                    | 100        | 4.2        | 0.2        | 10.2       |
|  | NODE3       | * <i>Notholithocarpus densiflorus</i>            | 91         | 12.7       | 2.2        | 40.2       |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                   | 36         | 1.0        | 0.2        | 3.2        |
|  | UMCA        | * <i>Umbellularia californica</i>                | 36         | 1.0        | 0.2        | 2.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | VAOV2       | <i>Vaccinium ovatum</i>                          | 82         | 2.0        | 0.2        | 4.0        |
|  | COCOC       | <i>Corylus cornuta</i> var. <i>californica</i>   | 45         | 1.2        | 0.2        | 3.0        |
|  | TODI        | <i>Toxicodendron diversilobum</i>                | 45         | 0.7        | 0.2        | 2.0        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | POMU        | <i>Polystichum munitum</i>                       | 73         | 11.5       | 2.0        | 35.0       |
|  | OXOR        | <i>Oxalis oregana</i>                            | 73         | 7.2        | 0.2        | 40.0       |
|  | TROV2       | <i>Trillium ovatum</i>                           | 73         | 0.2        | 0.2        | 0.2        |
|  | ATFI        | <i>Athyrium filix-femina</i>                     | 36         | 0.4        | 0.2        | 1.0        |
|  | DRAR3       | <i>Dryopteris arguta</i>                         | 27         | 0.5        | 0.2        | 1.0        |
|  | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 27         | 0.5        | 0.2        | 1.0        |
| <b>Non-vascular</b>                    |             |  |            |            |            |            |
|  | 2MOSS       | Moss   | 91         | 2.9        | 0.2        | 12.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus*  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (17) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 67.9         | 30–99         | –          |
| <b>Herb</b>                          | 6.6          | 0–60          | <0.5–2     |
| <b>Shrub</b>                         | 8.2          | 0–46          | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 10.0         | 0–27          | 2–15       |
| <b>Hardwood</b>                      | 17.3         | 1–36          | 5–35       |
| <b>Conifer</b>                       | 45.1         | 1–75          | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (11), SE (1), SW (4)

**Macrotopography:** lower 1/3 of slope (1), lower 1/3 of slope to ridgetop (1), lower to upper 1/3 of slope (3), middle 1/3 of slope (5), middle 1/3 of slope to ridgetop (2), middle to upper 1/3 of slope (1), upper 1/3 of slope (3), upper 1/3 of slope to ridgetop (2)

**Microtopography:** concave (3), convex (3), flat (4), undulating (8)

**Parent material:** Franciscan melange (8), sandstone (9), sedimentary (1)

**Soil texture:** clay or clay loam (2), loam or sandy loam (3), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (12), steep/>25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 819 ft. | 204–1605 ft. |
| <b>Slope</b>             | 17.5°   | 3–34°        |
| <b>Large rock cover</b>  | 0.1%    | 0–1%         |
| <b>Small rock cover</b>  | 1.4%    | 0–8%         |
| <b>Bare ground cover</b> | 6.2%    | 0–26%        |
| <b>Litter cover</b>      | 89.7%   | 65–98%       |

**Samples Used to Describe Association (n=18)**

**Rapid Assessments:** MILOB102, SONO0006, SONO0035, SONO0122, SONO0271, SONO0592, SONO0739, SONO0867, SONO0902, SONO0911, SONO0912, SONO0951, SONO0970, SONO0976, SONO0993

**Relevés:** SONO0081, SONO0252, SONO2195

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Provisional Association**

n = 18

| Lifeform | Code  | Botanical Name                        | Con | Avg  | Min | Max  |
|----------|-------|---------------------------------------|-----|------|-----|------|
| Tree     | SESE3 | * <i>Sequoia sempervirens</i>         | 100 | 27.9 | 6.0 | 63.0 |
|          | PSME  | * <i>Pseudotsuga menziesii</i>        | 100 | 17.1 | 1.0 | 45.0 |
|          | NODE3 | * <i>Notholithocarpus densiflorus</i> | 94  | 12.8 | 1.0 | 36.0 |
|          | UMCA  | * <i>Umbellularia californica</i>     | 50  | 3.8  | 1.0 | 6.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Provisional Association**

n = 18

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min | Max  |
|--|--------|--|-----|------|-----|------|
| <b>Tree</b>                            |        |  |     |      |     |      |
|  | TOCA   | <i>Torreya californica</i>                       | 22  | 7.8  | 1.0 | 25.0 |
|  | ARME   | <i>Arbutus menziesii</i>                         | 22  | 4.1  | 0.2 | 10.0 |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |     |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 94  | 4.7  | 0.2 | 17.0 |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 78  | 3.6  | 0.4 | 15.2 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 67  | 2.7  | 0.2 | 10.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 39  | 0.9  | 0.2 | 4.0  |
| <b>Shrub</b>                           |        |  |     |      |     |      |
|  | VAOV2  | <i>Vaccinium ovatum</i>                          | 50  | 10.7 | 0.2 | 36.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 33  | 0.5  | 0.2 | 2.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 28  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |        |  |     |      |     |      |
|  | POMU   | <i>Polystichum munitum</i>                       | 72  | 4.4  | 0.2 | 46.0 |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 44  | 0.7  | 0.2 | 2.0  |
|  | PRHO2  | <i>Prosartes hookeri</i>                         | 39  | 0.3  | 0.2 | 1.0  |
|  | CAREX  | <i>Carex</i>                                     | 28  | 0.2  | 0.2 | 0.2  |
|  | ATFI   | <i>Athyrium filix-femina</i>                     | 22  | 0.4  | 0.2 | 1.0  |
|  | GAAP2  | <i>Galium aparine</i>                            | 22  | 0.2  | 0.2 | 0.2  |
|  | TRBOL  | <i>Trientalis borealis</i> ssp. <i>latifolia</i> | 22  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |     |      |
|  | 2MOSS  | Moss   | 78  | 2.0  | 0.2 | 7.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Umbellularia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 82.6         | 75–98         | –          |
| <b>Herb</b>                          | 15.8         | 2–47          | <0.5–1     |
| <b>Shrub</b>                         | 6.5          | 0.2–23        | <0.5–5     |
| <b>Regenerating/understory tree*</b> | 4.2          | 0.2–10        | 2–10       |
| <b>Hardwood</b>                      | 6.8          | 0–20          | 10–50      |
| <b>Conifer</b>                       | 71.6         | 64–85         | 10–35      |

\*Includes seedlings and saplings

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**Summary of Environmental Data**

**Aspect:** NE (2), NW (2), SW (1)  
**Macrotopography:** bottom (1), lower 1/3 of slope (2), middle 1/3 of slope (2)  
**Microtopography:** concave (3), flat (2)  
**Parent material:** Franciscan melange (2), sandstone (1), volcanic (2)  
**Soil texture:** clay or clay loam (2)  
**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2), steep/>25° (2)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 402 ft. | 66–1121 ft. |
| <b>Slope</b>             | 16.6°   | 4–29°       |
| <b>Large rock cover</b>  | 0.1%    | 0–0.2%      |
| <b>Small rock cover</b>  | 0.8%    | 0–2%        |
| <b>Bare ground cover</b> | 6.3%    | 0–20%       |
| <b>Litter cover</b>      | 90.3%   | 76–98%      |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0005, SONO0459, SONO0823, SONO0842  
**Relevés:** SONO0254

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Umbellularia californica* Association**

n = 5

| Lifeform                               | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|--|-------|--|-----|------|------|------|
| <b>Tree</b>                            |       |  |     |      |      |      |
|  | SESE3 | * <i>Sequoia sempervirens</i>                  | 100 | 48.6 | 14.0 | 75.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 100 | 15.4 | 10.0 | 20.0 |
|  | UMCA  | * <i>Umbellularia californica</i>              | 80  | 3.5  | 1.0  | 5.0  |
|  | ARME  | <i>Arbutus menziesii</i>                       | 40  | 9.5  | 3.0  | 16.0 |
|  | ABGR  | * <i>Abies grandis</i>                         | 20  | 31.0 | 31.0 | 31.0 |
|  | TOCA  | * <i>Torreya californica</i>                   | 20  | 6.0  | 6.0  | 6.0  |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i>          | 20  | 0.2  | 0.2  | 0.2  |
|  | 2SNAG | Standing snag                                  | 20  | 0.1  | 0.1  | 0.1  |
| <b>Regenerating or Understory Tree</b> |       |  |     |      |      |      |
|  | SESE3 | * <i>Sequoia sempervirens</i>                  | 100 | 0.8  | 0.2  | 2.0  |
|  | UMCA  | * <i>Umbellularia californica</i>              | 60  | 3.4  | 3.0  | 4.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 60  | 0.8  | 0.2  | 1.2  |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i>          | 40  | 0.3  | 0.2  | 0.4  |
|  | ABGR  | * <i>Abies grandis</i>                         | 20  | 4.0  | 4.0  | 4.0  |
|  | TOCA  | * <i>Torreya californica</i>                   | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |  |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>              | 60  | 0.8  | 0.1  | 2.0  |
|  | COCOC | <i>Corylus cornuta</i> var. <i>californica</i> | 40  | 2.6  | 0.2  | 5.0  |
|  | VAOV2 | <i>Vaccinium ovatum</i>                        | 40  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Sequoia sempervirens* – *Pseudotsuga menziesii* – *Umbellularia californica* Association**

n = 5

| Lifeform     | Code  | Botanical Name                                      | Con                        | Avg  | Min  | Max  |      |
|--------------|-------|---|----------------------------|------|------|------|------|
| Shrub        | LOHI2 | <i>Lonicera hispidula</i>                           | 40                         | 0.2  | 0.2  | 0.2  |      |
|              | FRPU7 | <i>Frangula purshiana</i>                           | 20                         | 2.0  | 2.0  | 2.0  |      |
|              | GASH  | <i>Gaultheria shallon</i>                           | 20                         | 2.0  | 2.0  | 2.0  |      |
|              | CAOC5 | <i>Calycanthus occidentalis</i>                     | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | HODI  | <i>Holodiscus discolor</i>                          | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | RHOC  | <i>Rhododendron occidentale</i>                     | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | RIBES | <i>Ribes</i>  | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | ROSA5 | <i>Rosa</i>   | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | RUPA  | <i>Rubus parviflorus</i>                            | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | RUUR  | <i>Rubus ursinus</i>                                | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | SYAL  | <i>Symphoricarpos albus</i>                         | 20                         | 0.2  | 0.2  | 0.2  |      |
|              | Herb  | POMU  | <i>Polystichum munitum</i> | 100  | 11.4 | 1.0  | 30.0 |
| DRAR3        |       | <i>Dryopteris arguta</i>                            | 60                         | 0.2  | 0.2  | 0.2  |      |
| PRHO2        |       | <i>Prosartes hookeri</i>                            | 60                         | 0.2  | 0.2  | 0.2  |      |
| OXOR         |       | <i>Oxalis oregana</i>                               | 40                         | 11.1 | 0.2  | 22.0 |      |
| HEHE         |       | <i>Hedera helix</i>                                 | 40                         | 9.1  | 0.2  | 18.0 |      |
| TRBOL        |       | <i>Trientalis borealis</i> ssp. <i>latifolia</i>    | 40                         | 0.6  | 0.2  | 1.0  |      |
| ASCA2        |       | <i>Asarum caudatum</i>                              | 40                         | 0.2  | 0.2  | 0.2  |      |
| SACR2        |       | <i>Sanicula crassicaulis</i>                        | 40                         | 0.2  | 0.2  | 0.2  |      |
| SCBI         |       | <i>Scoliopus bigelovii</i>                          | 20                         | 1.0  | 1.0  | 1.0  |      |
| STAJ         |       | <i>Stachys ajugoides</i>                            | 20                         | 1.0  | 1.0  | 1.0  |      |
| MAST4        |       | <i>Maianthemum stellatum</i>                        | 20                         | 1.0  | 1.0  | 1.0  |      |
| CAREX        |       | <i>Carex</i>  | 20                         | 0.2  | 0.2  | 0.2  |      |
| MARA7        |       | <i>Maianthemum racemosum</i>                        | 20                         | 0.2  | 0.2  | 0.2  |      |
| TITRU        |       | <i>Tiarella trifoliata</i> var. <i>unifoliata</i>   | 20                         | 0.2  | 0.2  | 0.2  |      |
| PTAQP2       |       | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 20                         | 0.2  | 0.2  | 0.2  |      |
| MYOSO        |       | <i>Myosotis</i>                                     | 20                         | 0.2  | 0.2  | 0.2  |      |
| VIGL         |       | <i>Viola glabella</i>                               | 20                         | 0.2  | 0.2  | 0.2  |      |
| TROV         |       | <i>Trichostema ovatum</i>                           | 20                         | 0.2  | 0.2  | 0.2  |      |
| GACAC        |       | <i>Galium californicum</i> ssp. <i>californicum</i> | 20                         | 0.2  | 0.2  | 0.2  |      |
| GALIU        |       | <i>Galium</i>                                       | 20                         | 0.2  | 0.2  | 0.2  |      |
| CAOB3        |       | <i>Carex obnupta</i>                                | 20                         | 0.2  | 0.2  | 0.2  |      |
| BROMU        |       | <i>Bromus</i>                                       | 20                         | 0.2  | 0.2  | 0.2  |      |
| ATFI         |       | <i>Athyrium filix-femina</i>                        | 20                         | 0.2  | 0.2  | 0.2  |      |
| ADBI         |       | <i>Adenocaulon bicolor</i>                          | 20                         | 0.2  | 0.2  | 0.2  |      |
| COMA25       |       | <i>Corallorhiza maculata</i>                        | 20                         | 0.2  | 0.2  | 0.2  |      |
| Non-vascular |       | 2MOSS   | Moss                       | 80   | 0.6  | 0.2  | 1.0  |
|              |       | 2LICHN  | Lichen                     | 20   | 0.2  | 0.2  | 0.2  |

***Sequoia sempervirens* – *Umbellularia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (3), and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 68.2         | 59–80         | –          |
| <b>Herb</b>                          | 1.7          | 0–5           | <0.5–0.5   |
| <b>Shrub</b>                         | 5.3          | 0.2–14        | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 5.6          | 0–15          | 2–10       |
| <b>Hardwood</b>                      | 3.6          | 0–8           | 5–35       |
| <b>Conifer</b>                       | 60.2         | 38–80         | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (2), SE (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (2), flat (1), undulating (2)

**Parent material:** Franciscan melange (2), metamorphic (1), rhyolite (1), silty alluvium (1)

**Soil texture:** clay or clay loam (1), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (2), steep/>25° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 786 ft. | 68–1041 ft. |
| <b>Slope</b>             | 12.2°   | 2–26°       |
| <b>Large rock cover</b>  | 1.4%    | 0–5%        |
| <b>Small rock cover</b>  | 0.4%    | 0–2%        |
| <b>Bare ground cover</b> | 8.6%    | 4–16%       |
| <b>Litter cover</b>      | 87.0%   | 75–94%      |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** MILOB112, SONO0814, SONO0988

**Relevés:** SONO0253, SONO2193

**SCV Global/State Rank:** G3?/S3?¹

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Sequoia sempervirens* – *Umbellularia californica* Association**

n = 5

| Lifeform                               | Code   | Botanical Name                                      | Con                        | Avg  | Min  | Max  |     |
|--|--------|---|----------------------------|------|------|------|-----|
| Tree                                   | SESE3  | * <i>Sequoia sempervirens</i>                       | 100                        | 60.2 | 38.0 | 80.0 |     |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 80                         | 2.3  | 0.2  | 5.0  |     |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>               | 40                         | 1.5  | 1.0  | 2.0  |     |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 20                         | 2.0  | 2.0  | 2.0  |     |
|  | QUWI2  | * <i>Quercus wislizeni</i>                          | 20                         | 0.2  | 0.2  | 0.2  |     |
| <b>Regenerating or Understory Tree</b> |        |   |                            |      |      |      |     |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 100                        | 3.0  | 0.2  | 5.2  |     |
|  | SESE3  | * <i>Sequoia sempervirens</i>                       | 100                        | 2.4  | 0.2  | 5.0  |     |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>               | 20                         | 4.2  | 4.2  | 4.2  |     |
|  | QUWI2  | * <i>Quercus wislizeni</i>                          | 20                         | 0.4  | 0.4  | 0.4  |     |
|  | TOCA   | <i>Torreya californica</i>                          | 20                         | 0.4  | 0.4  | 0.4  |     |
|  | ARME   | <i>Arbutus menziesii</i>                            | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 20                         | 0.2  | 0.2  | 0.2  |     |
| Shrub                                  | TODI   | <i>Toxicodendron diversilobum</i>                   | 80                         | 4.1  | 0.2  | 7.0  |     |
|  | RUUR   | <i>Rubus ursinus</i>                                | 40                         | 3.0  | 1.0  | 5.0  |     |
|  | LOHI2  | <i>Lonicera hispidula</i>                           | 40                         | 0.2  | 0.2  | 0.2  |     |
|  | ARCA10 | <i>Aristolochia californica</i>                     | 20                         | 2.0  | 2.0  | 2.0  |     |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>      | 20                         | 2.0  | 2.0  | 2.0  |     |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | COPA14 | <i>Cotoneaster pannosus</i>                         | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | FRCAC5 | <i>Frangula californica</i> ssp. <i>californica</i> | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | ROSA5  | <i>Rosa</i>   | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | RUAR9  | <i>Rubus armeniacus</i>                             | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | RULE   | <i>Rubus leucodermis</i>                            | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | RUPA   | <i>Rubus parviflorus</i>                            | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | SYMO   | <i>Symphoricarpos mollis</i>                        | 20                         | 0.2  | 0.2  | 0.2  |     |
|  | Herb   | POMU  | <i>Polystichum munitum</i> | 80   | 0.9  | 0.2  | 2.0 |
|  |        | CAREX   | <i>Carex</i>               | 40   | 0.6  | 0.2  | 1.0 |
| PRHO2                                  |        | <i>Prosartes hookeri</i>                            | 40                         | 0.2  | 0.2  | 0.2  |     |
| ATFI                                   |        | <i>Athyrium filix-femina</i>                        | 20                         | 2.0  | 2.0  | 2.0  |     |
| ADBI                                   |        | <i>Adenocaulon bicolor</i>                          | 20                         | 1.0  | 1.0  | 1.0  |     |
| PETR7                                  |        | <i>Pentagramma triangularis</i>                     | 20                         | 1.0  | 1.0  | 1.0  |     |
| TRBOL                                  |        | <i>Trientalis borealis</i> ssp. <i>latifolia</i>    | 20                         | 1.0  | 1.0  | 1.0  |     |
| MAST4                                  |        | <i>Maianthemum stellatum</i>                        | 20                         | 0.2  | 0.2  | 0.2  |     |
| VIOLA                                  |        | <i>Viola</i>  | 20                         | 0.2  | 0.2  | 0.2  |     |
| OSBE                                   |        | <i>Osmorhiza berteroi</i>                           | 20                         | 0.2  | 0.2  | 0.2  |     |
| GAAP2                                  |        | <i>Galium aparine</i>                               | 20                         | 0.2  | 0.2  | 0.2  |     |
| DRAR3                                  |        | <i>Dryopteris arguta</i>                            | 20                         | 0.2  | 0.2  | 0.2  |     |
| CLDO2                                  |        | <i>Clinopodium douglasii</i>                        | 20                         | 0.2  | 0.2  | 0.2  |     |
| CAGL7                                  |        | <i>Carex globosa</i>                                | 20                         | 0.2  | 0.2  | 0.2  |     |
| BRCA5                                  |        | <i>Bromus carinatus</i>                             | 20                         | 0.2  | 0.2  | 0.2  |     |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.



**STAND TABLE** continued

***Sequoia sempervirens* – *Umbellularia californica* Association**

n = 5

| Lifeform            | Code   | Botanical Name           | Con | Avg | Min | Max |
|---------------------|--------|--------------------------|-----|-----|-----|-----|
| Herb                | STAJ   | <i>Stachys ajugoides</i> | 20  | 0.2 | 0.2 | 0.2 |
|                     | GALIU  | <i>Galium</i>            | 20  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |                          |     |     |     |     |
|                     | 2LICHN | Lichen                   | 60  | 0.2 | 0.2 | 0.2 |
|                     | 2MOSS  | Moss                     | 40  | 1.0 | 1.0 | 1.0 |

***Sequoia sempervirens* / *Oxalis oregana* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 73.3         | 72–75         | –          |
| <b>Herb</b>                          | 29.7         | 23–40         | <0.5–2     |
| <b>Shrub</b>                         | 1.1          | 0.2–2         | 1–5        |
| <b>Regenerating/understory tree*</b> | 4.7          | 1–7           | 2–10       |
| <b>Hardwood</b>                      | 17.3         | 2–25          | 15–50      |
| <b>Conifer</b>                       | 44.7         | 40–50         | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** Flat (1), NE (1), SE (1)

**Macrotopography:** bottom (2), bottom to lower 1/3 of slope (1)

**Microtopography:** concave (2), flat (1)

**Parent material:** Franciscan melange (1), metasedimentary (1), sandstone (1)

**Soil texture:** no data

**Slope steepness:** flat/0° (1), gentle/1-5° (1), moderate/6-25° (1)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 241 ft. | 38–467 ft. |
| <b>Slope</b>             | 6.7°    | 0–15°      |
| <b>Large rock cover</b>  | 0.0%    | 0–0%       |
| <b>Small rock cover</b>  | 0.4%    | 0–0.4%     |
| <b>Bare ground cover</b> | 8.7%    | 2–20%      |
| <b>Litter cover</b>      | 87.3%   | 75–95%     |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0099, SONO0879

**Relevés:** SONO0255

**SCV Global/State Rank:** G3/S3<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Sequoia sempervirens* / *Oxalis oregana* Association**

n = 3

| Lifeform                               | Code   | Botanical Name                                    | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | SESE3  | * <i>Sequoia sempervirens</i>                     | 100 | 43.3 | 40.0 | 50.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                 | 100 | 15.7 | 2.0  | 25.0 |
|  | ALRU2  | * <i>Alnus rubra</i>                              | 33  | 5.0  | 5.0  | 5.0  |
|  | TOCA   | * <i>Torreya californica</i>                      | 33  | 4.0  | 4.0  | 4.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | SESE3  | * <i>Sequoia sempervirens</i>                     | 100 | 2.5  | 0.2  | 5.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                 | 67  | 2.8  | 0.4  | 5.2  |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>               | 67  | 0.2  | 0.1  | 0.2  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                      | 33  | 1.2  | 1.2  | 1.2  |
|  | TOCA   | * <i>Torreya californica</i>                      | 33  | 0.2  | 0.2  | 0.2  |
|  | ALRU2  | * <i>Alnus rubra</i>                              | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | VAOV2  | <i>Vaccinium ovatum</i>                           | 67  | 0.6  | 0.2  | 1.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>    | 33  | 1.0  | 1.0  | 1.0  |
|  | PHCA11 | <i>Physocarpus capitatus</i>                      | 33  | 1.0  | 1.0  | 1.0  |
|  | MOCA6  | <i>Morella californica</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|  | ROSA5  | <i>Rosa</i>                                       | 33  | 0.2  | 0.2  | 0.2  |
|  | RULE   | <i>Rubus leucodermis</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|  | LOHI2  | <i>Lonicera hispidula</i>                         | 33  | 0.1  | 0.1  | 0.1  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | OXOR   | <i>Oxalis oregana</i>                             | 100 | 21.7 | 15.0 | 30.0 |
|  | POMU   | <i>Polystichum munitum</i>                        | 100 | 4.0  | 2.0  | 7.0  |
|  | ATFI   | <i>Athyrium filix-femina</i>                      | 67  | 2.0  | 1.0  | 3.0  |
|  | ADBI   | <i>Adenocaulon bicolor</i>                        | 67  | 1.5  | 1.0  | 2.0  |
|  | OSBE   | <i>Osmorhiza berteroi</i>                         | 67  | 0.2  | 0.2  | 0.2  |
|  | CAREX  | <i>Carex</i>                                      | 67  | 0.2  | 0.2  | 0.2  |
|  | JUNCU  | <i>Juncus</i>                                     | 67  | 0.2  | 0.2  | 0.2  |
|  | ARCA2  | <i>Aralia californica</i>                         | 33  | 1.0  | 1.0  | 1.0  |
|  | MAST4  | <i>Maianthemum stellatum</i>                      | 33  | 1.0  | 1.0  | 1.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 33  | 1.0  | 1.0  | 1.0  |
|  | TITRU  | <i>Tiarella trifoliata</i> var. <i>unifoliata</i> | 33  | 1.0  | 1.0  | 1.0  |
|  | STAJ   | <i>Stachys ajugoides</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | VIGL   | <i>Viola glabella</i>                             | 33  | 0.2  | 0.2  | 0.2  |
|  | VIOLA  | <i>Viola</i>                                      | 33  | 0.2  | 0.2  | 0.2  |
|  | TROV2  | <i>Trillium ovatum</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|  | EQUIS  | <i>Equisetum</i>                                  | 33  | 0.2  | 0.2  | 0.2  |
|  | TRBOL  | <i>Trientalis borealis</i> ssp. <i>latifolia</i>  | 33  | 0.2  | 0.2  | 0.2  |
|  | WOFI   | <i>Woodwardia fimbriata</i>                       | 33  | 0.2  | 0.2  | 0.2  |
|  | PRSM   | <i>Prosartes smithii</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | GALIU  | <i>Galium</i>                                     | 33  | 0.2  | 0.2  | 0.2  |
|  | BROMU  | <i>Bromus</i>                                     | 33  | 0.2  | 0.2  | 0.2  |
|  | ASCA2  | <i>Asarum caudatum</i>                            | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Sequoia sempervirens* / *Oxalis oregana* Association**

n = 3

| Lifeform            | Code   | Botanical Name             | Con | Avg | Min | Max |
|---------------------|--------|----------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |        |                            |     |     |     |     |
|                     | ADAL   | <i>Adiantum aleuticum</i>  | 33  | 0.2 | 0.2 | 0.2 |
|                     | JUPA2  | <i>Juncus patens</i>       | 33  | 0.2 | 0.2 | 0.2 |
|                     | SCBI   | <i>Scoliopus bigelovii</i> | 33  | 0.2 | 0.2 | 0.2 |
|                     | CYGR   | <i>Cynoglossum grande</i>  | 33  | 0.1 | 0.1 | 0.1 |
|                     | VICIA  | <i>Vicia</i>               | 33  | 0.1 | 0.1 | 0.1 |
|                     | WISE3  | <i>Viola sempervirens</i>  | 33  | 0.1 | 0.1 | 0.1 |
| <b>Non-vascular</b> |        |                            |     |     |     |     |
|                     | 2MOSS  | Moss                       | 100 | 1.7 | 0.2 | 3.0 |
|                     | 2LICHN | Lichen                     | 33  | 0.2 | 0.2 | 0.2 |

***Sequoia sempervirens* / *Woodwardia fimbriata* Riparian Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (6) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 54.5         | 7–75          | –          |
| <b>Herb</b>                          | 11.3         | 7–15          | <0.5–2     |
| <b>Shrub</b>                         | 8.7          | 1–23          | 1–5        |
| <b>Regenerating/understory tree*</b> | 12.9         | 0.2–40        | 2–15       |
| <b>Hardwood</b>                      | 10.8         | 2–36          | 5–35       |
| <b>Conifer</b>                       | 31.0         | 23–45         | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SW (1), variable (3)

**Macrotopography:** bottom (3), lower 1/3 of slope (2), middle 1/3 of slope (1)

**Microtopography:** concave (5), undulating (1)

**Parent material:** Franciscan melange (1), metamorphic (1), mixed alluvium (2), serpentine (1), siltstone (1)

**Soil texture:** loam or sandy loam (1), sand (1)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (2)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 624 ft. | 396–1144 ft. |
| <b>Slope</b>             | 5.4°    | 1–14°        |
| <b>Large rock cover</b>  | 3.1%    | 1–10%        |
| <b>Small rock cover</b>  | 22.0%   | 0–63%        |
| <b>Bare ground cover</b> | 18.2%   | 5–45%        |
| <b>Litter cover</b>      | 54.0%   | 20–74%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0189, SONO0209, SONO0593, SONO0632, SONO0719, SONO0817

**Relevés:** none

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

SCV Global/State Rank: G2?/S2?¹

**STAND TABLE**

***Sequoia sempervirens* / *Woodwardia fimbriata* Riparian Provisional Association**

n = 6

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 100 | 24.7 | 17.0 | 35.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 100 | 6.2  | 2.0  | 12.0 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 83  | 10.0 | 2.0  | 28.0 |
|  | ACMA3  | * <i>Acer macrophyllum</i>                       | 50  | 3.4  | 0.2  | 5.0  |
|  | ALRH2  | <i>Alnus rhombifolia</i>                         | 50  | 1.4  | 0.2  | 2.0  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 33  | 2.6  | 0.2  | 5.0  |
|  | FRLA   | <i>Fraxinus latifolia</i>                        | 33  | 1.6  | 0.2  | 3.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 83  | 4.4  | 0.2  | 15.2 |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 67  | 7.2  | 0.2  | 26.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 67  | 3.7  | 1.2  | 10.2 |
|  | UMCA   | * <i>Umbellularia californica</i>                | 67  | 2.0  | 0.4  | 4.2  |
|  | ACMA3  | * <i>Acer macrophyllum</i>                       | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 83  | 0.9  | 0.2  | 2.0  |
|  | RUUR   | <i>Rubus ursinus</i>                             | 50  | 2.4  | 0.2  | 5.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 50  | 1.1  | 0.2  | 3.0  |
|  | RUAR9  | <i>Rubus armeniacus</i>                          | 33  | 1.6  | 0.2  | 3.0  |
|  | RHOC   | <i>Rhododendron occidentale</i>                  | 33  | 0.6  | 0.2  | 1.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | WOFI   | <i>Woodwardia fimbriata</i>                      | 100 | 2.7  | 0.2  | 6.0  |
|  | POMU   | <i>Polystichum munitum</i>                       | 83  | 2.1  | 0.2  | 4.0  |
|  | CANU5  | <i>Carex nudata</i>                              | 50  | 1.8  | 0.2  | 5.0  |
|  | WHMO   | <i>Whipplea modesta</i>                          | 50  | 1.8  | 0.2  | 5.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33  | 3.5  | 1.0  | 6.0  |
|  | CAREX  | <i>Carex</i>                                     | 33  | 0.6  | 0.2  | 1.0  |
|  | JUNCU  | <i>Juncus</i>                                    | 33  | 0.2  | 0.2  | 0.2  |
|  | PETR7  | <i>Pentagramma triangularis</i>                  | 33  | 0.2  | 0.2  | 0.2  |
|  | CYPER  | <i>Cyperus</i>                                   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 83  | 8.0  | 1.0  | 15.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Umbellularia californica* Alliance**  
**California bay forest**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Umbellularia californica* is dominant or co-dominant in the tree or tall shrub canopy with *Acer macrophyllum*, *Aesculus californica*, *Alnus rhombifolia*, *Alnus rubra*, *Arbutus menziesii*, *Corylus cornuta*, *Juglans californica*, *Notholithocarpus densiflorus*, *Pinus sabiniana*, *Platanus racemosa*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus wislizeni*, and *Sequoia sempervirens*.

In many cases, *Umbellularia californica* is the only tree species in older stands with few shrubs and herbs present (McBride 1974). Stands occur near the coast and inland in both mesic and riparian settings, usually in a patchwork with stands of other evergreen forest or chaparral alliances. Coastal stands have characteristically wind-pruned trees or shrubs, and both coastal and inland stands typically have dense, clonally sprouted plants. The stands may be shrubby, as on ultramafic soils such as in the western Klamath Mountains, or they may be trees within a larger matrix of chaparral, as in central and southern California. Historically productive stands were cleared for agriculture and residential development (Stein 1990b).

Sonoma County

*Umbellularia californica* stands in Sonoma County are represented by six associations ranging from riparian settings to wind-blown upper slopes near the ocean.

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**Local Alliance Summary (n = 31)**

**Elevation:** 88–2098 ft, mean 946 ft

**SCV Global/State Rank:** G4/S3S4?<sup>2</sup>

**Noteworthy Taxa**

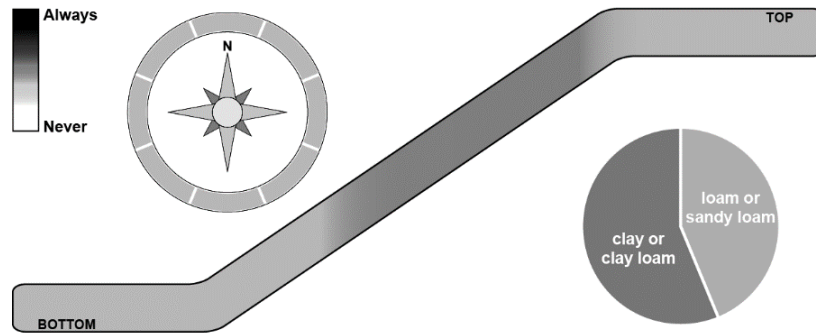
- Arctostaphylos bakeri* ssp. *bakeri*  
CA rare plant rank: 1B.1  
NatureServe global/state rank: G2T1/S1
- Ceanothus confusus*  
CA rare plant rank: 1B.1  
NatureServe global/state rank: G1/S1
- Ceanothus sonomensis*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G2/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 61.2         | 30–95         | –          |
| <b>Herb</b>                          | 11.1         | 0–53          | <0.5–2     |
| <b>Shrub</b>                         | 9.5          | 0–60          | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 6.7          | 0–32          | <0.5–20    |
| <b>Hardwood</b>                      | 37.9         | 0–67          | 5–35       |
| <b>Conifer</b>                       | 5.1          | 0–16          | 5–50       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.0° | 2–38°  |
| <b>Large rock cover</b>  | 4.9%  | 0–55%  |
| <b>Small rock cover</b>  | 8.1%  | 0–44%  |
| <b>Bare ground cover</b> | 16.1% | 0–51%  |
| <b>Litter cover</b>      | 68.3% | 10–97% |

**Associations within this Alliance:**

- Umbellularia californica* – *Acer macrophyllum* Association
- Umbellularia californica* – *Notholithocarpus densiflorus* Association
- Umbellularia californica* – *Pseudotsuga menziesii* / *Rhododendron occidentale* Association
- Umbellularia californica* – *Quercus agrifolia* Provisional Association
- Umbellularia californica* (Pure – Coastal) Provisional Association
- Umbellularia californica* / *Polystichum munitum* Association

**STAND TABLE**

***Umbellularia californica* Alliance**

n = 31

| Lifeform    | Code | Botanical Name                    | Con | Avg  | Min | Max  |
|-------------|------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b> | UMCA | * <i>Umbellularia californica</i> | 97  | 32.8 | 4.0 | 67.0 |
|             | PSME | * <i>Pseudotsuga menziesii</i>    | 55  | 7.7  | 0.2 | 16.0 |
|             | QUAG | * <i>Quercus agrifolia</i>        | 39  | 9.4  | 0.2 | 23.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Umbellularia californica* Alliance**

n = 31

| Lifeform                               | Code  | Botanical Name                                 | Con | Avg | Min | Max  |
|--|-------|--|-----|-----|-----|------|
| <b>Regenerating or Understory Tree</b> |       |  |     |     |     |      |
|  | UMCA  | * <i>Umbellularia californica</i>              | 81  | 7.2 | 0.2 | 33.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 45  | 1.3 | 0.2 | 3.2  |
|  | NODE3 | <i>Notholithocarpus densiflorus</i>            | 39  | 1.9 | 0.2 | 8.2  |
|  | QUAG  | * <i>Quercus agrifolia</i>                     | 23  | 1.3 | 0.2 | 6.0  |
| <b>Shrub</b>                           |       |  |     |     |     |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>              | 84  | 2.9 | 0.2 | 30.0 |
|  | RUUR  | <i>Rubus ursinus</i>                           | 35  | 2.3 | 0.2 | 8.0  |
|  | COCOC | <i>Corylus cornuta</i> var. <i>californica</i> | 29  | 2.6 | 0.2 | 10.0 |
|  | LOHI2 | <i>Lonicera hispidula</i>                      | 29  | 0.9 | 0.2 | 3.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                 | 26  | 1.2 | 0.2 | 5.0  |
| <b>Herb</b>                            |       |  |     |     |     |      |
|  | POMU  | <i>Polystichum munitum</i>                     | 52  | 9.1 | 0.2 | 45.0 |
|  | ATFI  | <i>Athyrium filix-femina</i>                   | 29  | 1.5 | 0.2 | 7.0  |
|  | PETR7 | <i>Pentagramma triangularis</i>                | 23  | 0.2 | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |       |  |     |     |     |      |
|  | 2MOSS | Moss   | 68  | 5.2 | 0.2 | 25.0 |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe global/state rank: G2T1/S1

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe global/state rank: G1/S1

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Umbellularia californica* – *Acer macrophyllum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.3         | 32–65         | –          |
| <b>Herb</b>                          | 9.5          | 2–28          | <0.5–2     |
| <b>Shrub</b>                         | 2.6          | 0.2–5         | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 7.3          | 0–19          | 0.5–5      |
| <b>Hardwood</b>                      | 36.8         | 5–60          | 5–35       |
| <b>Conifer</b>                       | 6.5          | 0–16          | 20–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (1), SW (1)

**Macrotopography:** bottom (1), bottom to lower 1/3 of slope (2), middle 1/3 of slope (1)

**Microtopography:** concave (4)

**Parent material:** Franciscan melange (2), volcanic (2)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1217 ft. | 443–1835 ft. |
| <b>Slope</b>             | 7.0°     | 2–12°        |
| <b>Large rock cover</b>  | 6.9%     | 0–27%        |
| <b>Small rock cover</b>  | 3.3%     | 0–8%         |
| <b>Bare ground cover</b> | 18.0%    | 6–51%        |
| <b>Litter cover</b>      | 68.8%    | 40–89%       |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0366, SONO0851, SONO1000

**Relevés:** SONO0540

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Umbellularia californica* – *Acer macrophyllum* Association**

n = 4

| Lifeform                               | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|--|-------|--|-----|------|------|------|
| <b>Tree</b>                            |       |  |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i>              | 100 | 27.8 | 4.0  | 53.0 |
|  | ACMA3 | * <i>Acer macrophyllum</i>                     | 100 | 10.3 | 5.0  | 20.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 50  | 13.0 | 10.0 | 16.0 |
|  | ARME  | <i>Arbutus menziesii</i>                       | 25  | 4.0  | 4.0  | 4.0  |
| <b>Regenerating or Understory Tree</b> |       |  |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i>              | 75  | 8.5  | 0.2  | 19.0 |
|  | NODE3 | <i>Notholithocarpus densiflorus</i>            | 25  | 5.0  | 5.0  | 5.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 25  | 0.2  | 0.2  | 0.2  |
|  | ACMA3 | * <i>Acer macrophyllum</i>                     | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |  |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>              | 100 | 2.1  | 0.2  | 5.0  |
|  | COCOC | <i>Corylus cornuta</i> var. <i>californica</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | RUUR  | <i>Rubus ursinus</i>                           | 25  | 2.0  | 2.0  | 2.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>                      | 25  | 1.0  | 1.0  | 1.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                 | 25  | 0.2  | 0.2  | 0.2  |
|  | ROGY  | <i>Rosa gymnocarpa</i>                         | 25  | 0.2  | 0.2  | 0.2  |
|  | SYAL  | <i>Symphoricarpos albus</i>                    | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |  |     |      |      |      |
|  | ATFI  | <i>Athyrium filix-femina</i>                   | 50  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

***Umbellularia californica* – *Acer macrophyllum* Association**

n = 4

| Lifeform     | Code  | Botanical Name  | Con | Avg  | Min  | Max  |
|--------------|-------|---|-----|------|------|------|
| Herb         | POMU  | <i>Polystichum munitum</i>                                | 50  | 1.0  | 1.0  | 1.0  |
|              | WOFI  | <i>Woodwardia fimbriata</i>                               | 25  | 24.0 | 24.0 | 24.0 |
|              | POLYS | <i>Polystichum</i>  | 25  | 2.0  | 2.0  | 2.0  |
|              | CAREX | <i>Carex</i>  | 25  | 1.0  | 1.0  | 1.0  |
|              | MIGU  | <i>Mimulus guttatus</i>                                   | 25  | 0.2  | 0.2  | 0.2  |
|              | CABO2 | <i>Carex bolanderi</i>                                    | 25  | 0.2  | 0.2  | 0.2  |
|              | PETR7 | <i>Pentagramma triangularis</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|              | STAL  | <i>Stachys albens</i>                                     | 25  | 0.2  | 0.2  | 0.2  |
|              | JUNCU | <i>Juncus</i>   | 25  | 0.2  | 0.2  | 0.2  |
|              | HOMA4 | <i>Hoita macrostachya</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|              | EQUIS | <i>Equisetum</i>  | 25  | 0.2  | 0.2  | 0.2  |
|              | ERPHP | <i>Erigeron philadelphicus</i> var. <i>philadelphicus</i> | 25  | 0.2  | 0.2  | 0.2  |
| Non-vascular | 2MOSS | Moss  | 75  | 9.7  | 0.2  | 24.0 |

***Umbellularia californica* – *Notholithocarpus densiflorus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 50.0         | 50            | –          |
| Herb                          | 26.0         | 26            | 0.5–1      |
| Shrub                         | 2.0          | 2             | 1–2        |
| Regenerating/understory tree* | 3.0          | 3             | 2–5        |
| Hardwood                      | 20.0         | 20            | 15–20      |
| Conifer                       | 3.0          | 3             | 15–20      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1)

**Macrotopography:** middle 1/3 of slope (1)

**Microtopography:** concave (1)

**Parent material:** mixed alluvium (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (1)

|                   | Mean    | Range   |
|-------------------|---------|---------|
| Elevation         | 510 ft. | 510 ft. |
| Slope             | 18.0°   | 18°     |
| Large rock cover  | 0.0%    | 0%      |
| Small rock cover  | 0.0%    | 0%      |
| Bare ground cover | 0.0%    | 0%      |
| Litter cover      | 96.0%   | 96%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0004  
**Relevés:** none

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

**STAND TABLE**

***Umbellularia californica* – *Notholithocarpus densiflorus* Association**

n = 1

| Lifeform                               | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|--|-------|---------------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                       |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i>     | 100 | 12.0 | 12.0 | 12.0 |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 8.0  | 8.0  | 8.0  |
|  | SESE3 | <i>Sequoia sempervirens</i>           | 100 | 2.0  | 2.0  | 2.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 100 | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |       |                                       |     |      |      |      |
|  | NODE3 | * <i>Notholithocarpus densiflorus</i> | 100 | 2.0  | 2.0  | 2.0  |
|  | UMCA  | * <i>Umbellularia californica</i>     | 100 | 1.0  | 1.0  | 1.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>        | 100 | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                       |     |      |      |      |
|  | VAOV2 | <i>Vaccinium ovatum</i>               | 100 | 1.0  | 1.0  | 1.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>     | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                                       |     |      |      |      |
|  | WHMO  | <i>Whipplea modesta</i>               | 100 | 20.0 | 20.0 | 20.0 |
|  | POMU  | <i>Polystichum munitum</i>            | 100 | 3.0  | 3.0  | 3.0  |
|  | ATFI  | <i>Athyrium filix-femina</i>          | 100 | 1.0  | 1.0  | 1.0  |
|  | BRCA5 | <i>Bromus carinatus</i>               | 100 | 0.2  | 0.2  | 0.2  |
|  | LETA  | <i>Leontodon taraxacoides</i>         | 100 | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Umbellularia californica* – *Pseudotsuga menziesii* / *Rhododendron occidentale* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 55–75         | –          |
| <b>Herb</b>                          | 6.0          | 2–10          | <0.5–0.5   |
| <b>Shrub</b>                         | 15.0         | 15–15         | 2–5        |
| <b>Regenerating/understory tree*</b> | 10.0         | 0–20          | 5–10       |
| <b>Hardwood</b>                      | 30.0         | 20–40         | 10–15      |
| <b>Conifer</b>                       | 4.0          | 3–5           | 20–35      |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** NE (1), variable (1)  
**Macrotopography:** bottom (1), middle 1/3 of slope (1)  
**Microtopography:** concave (2)  
**Parent material:** serpentine (1), volcanic (1)  
**Soil texture:** loam or sandy loam (1)  
**Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 850 ft. | 561–1138 ft. |
| <b>Slope</b>             | 4.0°    | 4–4°         |
| <b>Large rock cover</b>  | 28.0%   | 1–55%        |
| <b>Small rock cover</b>  | 17.0%   | 5–29%        |
| <b>Bare ground cover</b> | 11.6%   | 0–23%        |
| <b>Litter cover</b>      | 40.0%   | 10–70%       |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** MILOB006, SONO0811  
**Relevés:** none

**SCV Global/State Rank:** G2?/S2??<sup>1</sup>

**STAND TABLE**

***Umbellularia californica* – *Pseudotsuga menziesii* / *Rhododendron occidentale* Association**

n = 2

| Lifeform                               | Code   | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                  | 100 | 25.0 | 20.0 | 30.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                     | 100 | 2.0  | 1.0  | 3.0  |
|  | ARME   | <i>Arbutus menziesii</i>                           | 50  | 5.0  | 5.0  | 5.0  |
|  | HESA17 | <i>Hesperocyparis sargentii</i>                    | 50  | 5.0  | 5.0  | 5.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                         | 50  | 5.0  | 5.0  | 5.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                  | 50  | 10.0 | 10.0 | 10.0 |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>                | 50  | 8.2  | 8.2  | 8.2  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                     | 50  | 1.0  | 1.0  | 1.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                         | 50  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | RHOC   | <i>Rhododendron occidentale</i>                    | 100 | 10.5 | 7.0  | 14.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                     | 100 | 2.6  | 0.2  | 5.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|  | CAOC5  | <i>Calycanthus occidentalis</i>                    | 50  | 20.0 | 20.0 | 20.0 |
|  | RUUR   | <i>Rubus ursinus</i>                               | 50  | 3.0  | 3.0  | 3.0  |
|  | FRCAT2 | <i>Frangula californica</i> ssp. <i>tomentella</i> | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Umbellularia californica* – *Pseudotsuga menziesii* / *Rhododendron occidentale* Association**

n = 2

| Lifeform     | Code  | Botanical Name                  | Con | Avg  | Min | Max  |
|--------------|-------|---------------------------------|-----|------|-----|------|
| Herb         |       |                                 |     |      |     |      |
|              | CAREX | <i>Carex</i>                    | 100 | 1.6  | 0.2 | 3.0  |
|              | POMU  | <i>Polystichum munitum</i>      | 100 | 1.1  | 0.2 | 2.0  |
|              | WOFI  | <i>Woodwardia fimbriata</i>     | 50  | 5.0  | 5.0 | 5.0  |
|              | ADJO  | <i>Adiantum jordanii</i>        | 50  | 0.2  | 0.2 | 0.2  |
|              | AGEX  | <i>Agrostis exarata</i>         | 50  | 0.2  | 0.2 | 0.2  |
|              | EHHER | <i>Ehrharta erecta</i>          | 50  | 0.2  | 0.2 | 0.2  |
|              | ELGL  | <i>Elymus glaucus</i>           | 50  | 0.2  | 0.2 | 0.2  |
|              | JUOX  | <i>Juncus oxymersis</i>         | 50  | 0.2  | 0.2 | 0.2  |
|              | METO  | <i>Melica torreyana</i>         | 50  | 0.2  | 0.2 | 0.2  |
|              | PETR7 | <i>Pentagramma triangularis</i> | 50  | 0.2  | 0.2 | 0.2  |
|              | STAJ  | <i>Stachys ajugoides</i>        | 50  | 0.2  | 0.2 | 0.2  |
|              | STAL  | <i>Stachys albens</i>           | 50  | 0.2  | 0.2 | 0.2  |
| Non-vascular |       |                                 |     |      |     |      |
|              | 2MOSS | Moss                            | 100 | 13.0 | 1.0 | 25.0 |

***Umbellularia californica* – *Quercus agrifolia* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 60.8         | 30–80         | –          |
| Herb                          | 11.4         | 1–20          | <0.5–2     |
| Shrub                         | 8.8          | 4–16          | <0.5–5     |
| Regenerating/understory tree* | 1.6          | 0–6           | 2–5        |
| Hardwood                      | 37.0         | 28–43         | 10–35      |
| Conifer                       | 6.2          | 0–12          | 20–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (3), SW (1), variable (1)

**Macrotopography:** lower 1/3 of slope (2), middle 1/3 of slope (2), upper 1/3 of slope (2)

**Microtopography:** concave (2), convex (3), undulating (1)

**Parent material:** Franciscan melange (3), serpentine (1), volcanic (2)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (5)

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 935 ft. | 638–1676 ft. |
| Slope             | 12.2°   | 3–18°        |
| Large rock cover  | 1.3%    | 0–3%         |
| Small rock cover  | 4.8%    | 1–15%        |
| Bare ground cover | 6.6%    | 1–16%        |
| Litter cover      | 84.8%   | 71–96%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** MILOB104, MILOB117, SERP0006, SONO0208, SONO0368, SONO0628  
**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Umbellularia californica* – *Quercus agrifolia* Provisional Association**

n = 6

| Lifeform                               | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|--|-------|--|-----|------|------|------|
| <b>Tree</b>                            |       |  |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i>              | 100 | 20.2 | 14.0 | 30.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>                     | 100 | 15.3 | 10.0 | 23.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 50  | 9.7  | 7.0  | 12.0 |
| <b>Regenerating or Understory Tree</b> |       |  |     |      |      |      |
|  | UMCA  | * <i>Umbellularia californica</i>              | 83  | 2.4  | 0.2  | 5.2  |
|  | QUAG  | * <i>Quercus agrifolia</i>                     | 67  | 1.7  | 0.2  | 6.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                 | 50  | 1.0  | 0.4  | 2.2  |
| <b>Shrub</b>                           |       |  |     |      |      |      |
|  | TODI  | <i>Toxicodendron diversilobum</i>              | 83  | 8.4  | 1.0  | 30.0 |
|  | LOHI2 | <i>Lonicera hispidula</i>                      | 50  | 1.7  | 1.0  | 3.0  |
|  | COCOC | <i>Corylus cornuta</i> var. <i>californica</i> | 33  | 5.5  | 3.0  | 8.0  |
|  | RUUR  | <i>Rubus ursinus</i>                           | 33  | 2.1  | 0.2  | 4.0  |
|  | HODI  | <i>Holodiscus discolor</i>                     | 33  | 0.6  | 0.2  | 1.0  |
|  | ROGY  | <i>Rosa gymnocarpa</i>                         | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |  |     |      |      |      |
|  | POMU  | <i>Polystichum munitum</i>                     | 50  | 6.0  | 1.0  | 15.0 |
|  | GALIU | <i>Galium</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|  | CYGR  | <i>Cynoglossum grande</i>                      | 33  | 0.2  | 0.2  | 0.2  |
|  | FRVE  | <i>Fragaria vesca</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | METO  | <i>Melica torreyana</i>                        | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |       |  |     |      |      |      |
|  | 2MOSS | Moss   | 67  | 3.0  | 1.0  | 6.0  |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G2T1/S1

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Umbellularia californica* (Pure – Coastal) Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (5), and Mount St. Helena Flows and Valleys/263Am (4) USDA Ecological Subsections (Miles and Goudey 1997).

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.6         | 30–71         | –          |
| <b>Herb</b>                          | 4.6          | 2–7           | <0.5–2     |
| <b>Shrub</b>                         | 3.7          | 0–8           | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 6.1          | 0.2–32        | <0.5–20    |
| <b>Hardwood</b>                      | 44.0         | 11–67         | 10–35      |
| <b>Conifer</b>                       | 4.6          | 0–15          | 15–35      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (2), SE (2), SW (1), variable (3)

**Macrotopography:** bottom to upper 1/3 of slope (1), lower to upper 1/3 of slope (2), middle 1/3 of slope (2), middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (7), flat (1), undulating (1)

**Parent material:** Franciscan melange (5), metasedimentary (1), sedimentary (1), ultramafic (1), volcanic (2)

**Soil texture:** clay or clay loam (2), loam or sandy loam (3)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (2), steep/>25° (5)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1014 ft. | 138–2098 ft. |
| <b>Slope</b>             | 18.6°    | 2–38°        |
| <b>Large rock cover</b>  | 2.4%     | 0–10%        |
| <b>Small rock cover</b>  | 6.9%     | 0–30%        |
| <b>Bare ground cover</b> | 22.1%    | 1–43%        |
| <b>Litter cover</b>      | 66.2%    | 50–88%       |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** SONO0096, SONO0109, SONO0124, SONO0316, SONO0371, SONO0387, SONO0655, SONO0718, SONO0987

**Relevés:** SONO0082

**SCV Global/State Rank:** G3G4?/S3S4?¹

**STAND TABLE**

***Umbellularia californica* (Pure – Coastal) Provisional Association**

n = 10

| Lifeform    | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|-------------|-------|---------------------------------------|-----|------|------|------|
| <b>Tree</b> |       |                                       |     |      |      |      |
|             | UMCA  | * <i>Umbellularia californica</i>     | 100 | 42.3 | 10.0 | 67.0 |
|             | PSME  | * <i>Pseudotsuga menziesii</i>        | 50  | 8.4  | 0.2  | 15.0 |
|             | NODE3 | * <i>Notholithocarpus densiflorus</i> | 30  | 4.3  | 1.0  | 10.0 |
|             | QUGA4 | <i>Quercus garryana</i>               | 30  | 2.1  | 0.2  | 3.0  |
|             | QUAG  | <i>Quercus agrifolia</i>              | 20  | 4.1  | 0.2  | 8.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Umbellularia californica* (Pure – Coastal) Provisional Association**

n = 10

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg | Min | Max  |
|--|--------|--|-----|-----|-----|------|
| <b>Tree</b>                            |        |  |     |     |     |      |
|  | QUKE   | <i>Quercus kelloggii</i>                         | 20  | 2.0 | 1.0 | 3.0  |
|  | ARME   | <i>Arbutus menziesii</i>                         | 20  | 2.0 | 2.0 | 2.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |     |     |      |
|  | UMCA   | * <i>Umbellularia californica</i>                | 90  | 6.0 | 0.2 | 33.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 40  | 1.9 | 1.0 | 3.2  |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 30  | 0.8 | 0.2 | 2.0  |
|  | SESE3  | <i>Sequoia sempervirens</i>                      | 20  | 0.2 | 0.2 | 0.2  |
| <b>Shrub</b>                           |        |  |     |     |     |      |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 80  | 1.7 | 0.2 | 5.0  |
|  | RUUR   | <i>Rubus ursinus</i>                             | 30  | 3.1 | 0.2 | 8.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                   | 30  | 1.3 | 1.0 | 2.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                        | 30  | 0.5 | 0.2 | 1.0  |
|  | RUAR9  | <i>Rubus armeniacus</i>                          | 20  | 2.1 | 0.2 | 4.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>   | 20  | 0.6 | 0.2 | 1.0  |
|  | ROGY   | <i>Rosa gymnocarpa</i>                           | 20  | 0.6 | 0.2 | 1.0  |
| <b>Herb</b>                            |        |  |     |     |     |      |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 40  | 0.2 | 0.2 | 0.2  |
|  | POMU   | <i>Polystichum munitum</i>                       | 30  | 1.5 | 0.2 | 4.0  |
|  | CYEC   | <i>Cynosurus echinatus</i>                       | 30  | 1.4 | 0.2 | 3.0  |
|  | ELGL   | <i>Elymus glaucus</i>                            | 30  | 1.1 | 0.2 | 2.0  |
|  | CAREX  | <i>Carex</i>                                     | 30  | 0.2 | 0.2 | 0.2  |
|  | DRAR3  | <i>Dryopteris arguta</i>                         | 30  | 0.2 | 0.2 | 0.2  |
|  | PETR7  | <i>Pentagramma triangularis</i>                  | 30  | 0.2 | 0.2 | 0.2  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                  | 20  | 0.6 | 0.2 | 1.0  |
|  | METO   | <i>Melica torreyana</i>                          | 20  | 0.6 | 0.2 | 1.0  |
|  | STACH  | <i>Stachys</i>                                   | 20  | 0.6 | 0.2 | 1.0  |
|  | TOAR   | <i>Torilis arvensis</i>                          | 20  | 0.6 | 0.2 | 1.0  |
|  | VIOLA  | <i>Viola</i>                                     | 20  | 0.6 | 0.2 | 1.0  |
|  | CAPY2  | <i>Carduus pycnocephalus</i>                     | 20  | 0.2 | 0.2 | 0.2  |
|  | IRIS   | <i>Iris</i>                                      | 20  | 0.2 | 0.2 | 0.2  |
|  | ATFI   | <i>Athyrium filix-femina</i>                     | 20  | 0.2 | 0.2 | 0.2  |
|  | ADBI   | <i>Adenocaulon bicolor</i>                       | 20  | 0.2 | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |     |     |      |
|  | 2MOSS  | Moss   | 80  | 3.5 | 1.0 | 12.0 |
|  | 2LICHN | Lichen   | 20  | 0.2 | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Umbellularia californica* / *Polystichum munitum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) USDA Ecological Subsection (Miles and Goudey 1997).

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 81.8         | 66–95         | –          |
| <b>Herb</b>                          | 34.5         | 15–53         | 0.5–2      |
| <b>Shrub</b>                         | 13.9         | 0.2–45        | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 6.0          | 0–20          | 2–20       |
| <b>Hardwood</b>                      | 52.0         | 35–65         | 10–35      |
| <b>Conifer</b>                       | 8.8          | 5–15          | 10–50      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), variable (2)

**Macrotopography:** lower to upper 1/3 of slope (1), middle 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (1), undulating (3)

**Parent material:** Franciscan melange (4)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (3), steep/>25° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 665 ft. | 471–865 ft. |
| <b>Slope</b>             | 21.5°   | 18–26°      |
| <b>Large rock cover</b>  | 0.1%    | 0–0.2%      |
| <b>Small rock cover</b>  | 1.0%    | 0–2%        |
| <b>Bare ground cover</b> | 11.1%   | 0–38%       |
| <b>Litter cover</b>      | 85.5%   | 58–97%      |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** MILOB106, MILOB120, SONO0162, SONO0971

**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Umbellularia californica* / *Polystichum munitum* Association**

n = 4

| Lifeform | Code  | Botanical Name                        | Con | Avg  | Min  | Max  |
|----------|-------|---------------------------------------|-----|------|------|------|
| Tree     | UMCA  | * <i>Umbellularia californica</i>     | 100 | 50.3 | 35.0 | 65.0 |
|          | PSME  | * <i>Pseudotsuga menziesii</i>        | 75  | 8.3  | 3.0  | 15.0 |
|          | NODE3 | * <i>Notholithocarpus densiflorus</i> | 50  | 0.6  | 0.2  | 1.0  |
|          | QUAG  | * <i>Quercus agrifolia</i>            | 50  | 0.6  | 0.2  | 1.0  |
|          | SESE3 | * <i>Sequoia sempervirens</i>         | 25  | 8.0  | 8.0  | 8.0  |
|          | FRLA  | <i>Fraxinus latifolia</i>             | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Umbellularia californica* / *Polystichum munitum* Association**

n = 4

| Lifeform                               | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | NODE3  | * <i>Notholithocarpus densiflorus</i>            | 100 | 1.1  | 0.2  | 3.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                | 75  | 9.2  | 0.4  | 22.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                   | 50  | 1.2  | 0.2  | 2.2  |
|  | SESE3  | * <i>Sequoia sempervirens</i>                    | 25  | 2.2  | 2.2  | 2.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>                       | 25  | 0.4  | 0.4  | 0.4  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>                             | 100 | 1.9  | 0.2  | 4.0  |
|  | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>   | 75  | 3.5  | 0.2  | 10.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                | 75  | 2.1  | 0.2  | 6.0  |
|  | RUPA   | <i>Rubus parviflorus</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|  | VAOV2  | <i>Vaccinium ovatum</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|  | SARAR3 | <i>Sambucus racemosa</i> var. <i>racemosa</i>    | 25  | 35.0 | 35.0 | 35.0 |
|  | RISA   | <i>Ribes sanguineum</i>                          | 25  | 1.0  | 1.0  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                   | 25  | 0.2  | 0.2  | 0.2  |
|  | LONIC  | <i>Lonicera</i>                                  | 25  | 0.2  | 0.2  | 0.2  |
|  | RUSP   | <i>Rubus spectabilis</i>                         | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | POMU   | <i>Polystichum munitum</i>                       | 100 | 29.0 | 6.0  | 45.0 |
|  | TRBOL  | <i>Trientalis borealis</i> ssp. <i>latifolia</i> | 75  | 0.5  | 0.2  | 1.0  |
|  | ATFI   | <i>Athyrium filix-femina</i>                     | 50  | 1.6  | 0.2  | 3.0  |
|  | DRAR3  | <i>Dryopteris arguta</i>                         | 50  | 0.6  | 0.2  | 1.0  |
|  | CYGR   | <i>Cynoglossum grande</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|  | OXOR   | <i>Oxalis oregana</i>                            | 25  | 20.0 | 20.0 | 20.0 |
|  | MAOR3  | <i>Marah oreganus</i>                            | 25  | 5.0  | 5.0  | 5.0  |
|  | SACR2  | <i>Sanicula crassicaulis</i>                     | 25  | 1.0  | 1.0  | 1.0  |
|  | FEOC   | <i>Festuca occidentalis</i>                      | 25  | 0.2  | 0.2  | 0.2  |
|  | STAJ   | <i>Stachys ajugoides</i>                         | 25  | 0.2  | 0.2  | 0.2  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 25  | 0.2  | 0.2  | 0.2  |
|  | TROV2  | <i>Trillium ovatum</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | FRVE   | <i>Fragaria vesca</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|  | CLAN2  | <i>Clintonia andrewsiana</i>                     | 25  | 0.2  | 0.2  | 0.2  |
|  | CLDO2  | <i>Clinopodium douglasii</i>                     | 25  | 0.2  | 0.2  | 0.2  |
|  | BRVU   | <i>Bromus vulgaris</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | BRLA3  | <i>Bromus laevipes</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | GAAP2  | <i>Galium aparine</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|  | DEOD   | <i>Delairea odorata</i>                          | 25  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 50  | 3.0  | 2.0  | 4.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

## Shrub Alliance Descriptions



This *Lupinus arboreus* Shrubland Association stand was photographed on a coastal bluff at Fort Ross State Historic Park.

## ***Adenostoma fasciculatum* Alliance**

### **Chamise chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Adenostoma fasciculatum* is dominant in the shrub canopy with *Adenostoma sparsifolium*, *Arctostaphylos glandulosa*, *Arctostaphylos manzanita*, *Arctostaphylos viscida*, *Ceanothus* spp., *Diplacus aurantiacus*, *Eriodictyon californicum*, *Eriogonum fasciculatum*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus wislizeni*, *Salvia apiana*, *Salvia leucophylla*, *Salvia mellifera*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover.

This alliance occurs across cismontane California in a variety of topographic settings from coastal bluffs to steep, lower montane slopes. In stands older than 60 years of age, little new growth is produced as dead stem biomass increases. In earlier treatments, several chaparral series were assigned to mixed alliances other than *Adenostoma fasciculatum* when other shrubs were co-dominant (Sawyer and Keeler-Wolf 1995). Following extensive review and the analysis of many more plots, most mixed stands where another indicator species is either strongly dominant or co-dominant with *A. fasciculatum* were treated as part of other alliances. The few exceptions include the *Adenostoma fasciculatum* – *Salvia mellifera* and *Adenostoma fasciculatum* – *Salvia apiana* Alliances.

### Sonoma County

*Adenostoma fasciculatum* stands are located primarily in the interior of the county, away from cool coastal summer air masses. Most of these inland stands are located on steep, south-facing slopes. The few stands that are close to the coast tend to be on serpentine or on extremely steep, south-facing, rocky slopes over 1000 ft in elevation. Stands at Camp Meeker and Black Mountain are examples of stands with coastal influence. In Sonoma County, *Adenostoma fasciculatum* stands tend to mix with low cover of several *Arctostaphylos* species.

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### **Local Alliance Summary (n = 31)**

**Elevation:** 254–3809 ft, mean 1351 ft

**SCV Global/State Rank:** G5/S5<sup>2</sup>

#### **Noteworthy Taxa**

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

*Cordylanthus tenuis* ssp. *capillaris*

CA rare plant rank: 1B.2

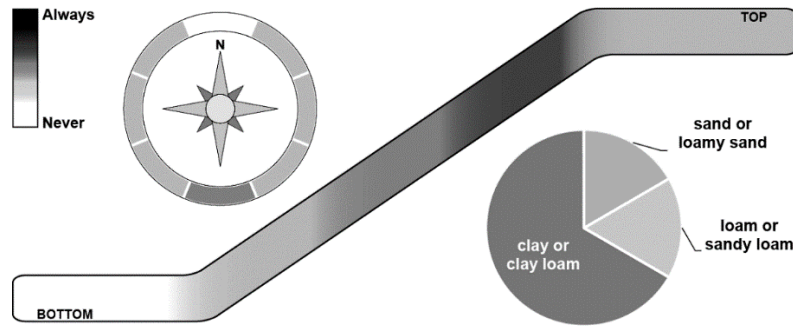
NatureServe global/state rank: G4G5T1/S1

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 61.9         | 30–90         | –          |
| <b>Herb</b>                          | 11.2         | 0–50          | <0.5–1     |
| <b>Shrub</b>                         | 56.6         | 22–85         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.9          | 0–6           | <0.5–5     |
| <b>Hardwood</b>                      | 0.8          | 0–5           | 2–10       |
| <b>Conifer</b>                       | 0.5          | 0–5           | 5–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 20.9° | 4–40° |
| <b>Large rock cover</b>  | 4.8%  | 0–20% |
| <b>Small rock cover</b>  | 23.7% | 2–65% |
| <b>Bare ground cover</b> | 35.8% | 2–84% |
| <b>Litter cover</b>      | 33.8% | 2–92% |

**Associations within this Alliance:**

- Adenostoma fasciculatum* – *Arctostaphylos manzanita* Association
- Adenostoma fasciculatum* – *Arctostaphylos stanfordiana* / *Salvia sonomensis* Provisional Association
- Adenostoma fasciculatum* – *Diplacus aurantiacus* Association
- Adenostoma fasciculatum* Association
- Adenostoma fasciculatum* Serpentine Association

**STAND TABLE**

***Adenostoma fasciculatum* Alliance**

n = 31

| Lifeform | Code | Botanical Name                    | Con | Avg | Min | Max |
|----------|------|-----------------------------------|-----|-----|-----|-----|
| Tree     | QUAG | * <i>Quercus agrifolia</i>        | 26  | 1.0 | 0.2 | 3.0 |
|          | UMCA | * <i>Umbellularia californica</i> | 23  | 2.5 | 0.2 | 6.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Adenostoma fasciculatum* Alliance**

n = 31

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 35  | 0.9  | 0.2  | 2.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 32  | 1.5  | 0.2  | 4.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 100 | 41.6 | 13.0 | 80.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 52  | 2.1  | 0.2  | 10.0 |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 48  | 1.3  | 0.2  | 5.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 45  | 1.9  | 0.2  | 7.0  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 42  | 6.9  | 0.2  | 35.0 |
|  | ARST   | <i>Arctostaphylos stanfordiana</i>                  | 35  | 2.6  | 1.0  | 6.0  |
|  | QUDU4  | <i>Quercus durata</i>                               | 26  | 4.1  | 0.2  | 15.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 23  | 6.2  | 0.2  | 25.0 |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 23  | 2.6  | 0.2  | 9.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | SASO   | <i>Salvia sonomensis</i>                            | 32  | 19.8 | 4.0  | 45.0 |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 29  | 2.8  | 0.2  | 10.0 |
|  | AVBA   | <i>Avena barbata</i>                                | 26  | 1.1  | 0.2  | 2.0  |
|  | BRDI2  | <i>Brachypodium distachyon</i>                      | 23  | 9.0  | 0.2  | 25.0 |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 48  | 2.5  | 0.2  | 10.0 |
|  | 2LICHN | Lichen  | 48  | 1.4  | 0.2  | 7.0  |

**Noteworthy Taxa**

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Cordylanthus tenuis* ssp. *capillaris*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4G5T1/S1

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Adenostoma fasciculatum* – *Arctostaphylos manzanita* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 65.8         | 50–80         | –          |
| <b>Herb</b>             | 7.8          | 1–15          | <0.5–0.5   |
| <b>Shrub</b>            | 60.8         | 39–76         | 1–5        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 1.7          | 0–5           | 2–5        |
| <b>Hardwood</b>                      | 1.3          | 0–4           | 2–10       |
| <b>Conifer</b>                       | 0.7          | 0–4           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2), SE (2), SW (2)

**Macrotopography:** lower to upper 1/3 of slope (1), middle 1/3 of slope (2), upper 1/3 of slope (3)

**Microtopography:** concave (2), convex (3), undulating (1)

**Parent material:** Franciscan melange (1), sandstone (2), volcanic (3)

**Soil texture:** no data

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (3), steep/>25° (2)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 987 ft. | 632–1638 ft. |
| <b>Slope</b>             | 18.0°   | 4–40°        |
| <b>Large rock cover</b>  | 1.6%    | 0–6%         |
| <b>Small rock cover</b>  | 13.8%   | 2–43%        |
| <b>Bare ground cover</b> | 36.3%   | 4–84%        |
| <b>Litter cover</b>      | 46.8%   | 10–90%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0154, SONO0584, SONO0607, SONO0624, SONO0807, SONO0983

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Adenostoma fasciculatum* – *Arctostaphylos manzanita* Association**

n = 6

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            |       |   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>                          | 33  | 1.5  | 1.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>                          | 67  | 1.8  | 1.0  | 2.0  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                      | 100 | 54.0 | 32.0 | 70.0 |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                     | 83  | 4.6  | 2.0  | 7.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 83  | 1.7  | 0.2  | 4.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 83  | 0.7  | 0.2  | 1.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 67  | 1.6  | 0.2  | 3.0  |
|  | BAPI  | <i>Baccharis pilularis</i>                          | 50  | 2.7  | 1.0  | 5.0  |
| <b>Herb</b>                            |       |   |     |      |      |      |
|  | BRHO2 | <i>Bromus hordeaceus</i>                            | 67  | 4.5  | 1.0  | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Adenostoma fasciculatum* – *Arctostaphylos manzanita* Association**

n = 6

| Lifeform     | Code   | Botanical Name                  | Con | Avg | Min | Max  |
|--------------|--------|---------------------------------|-----|-----|-----|------|
| Herb         |        |                                 |     |     |     |      |
|              | BRDI2  | <i>Brachypodium distachyon</i>  | 33  | 6.0 | 2.0 | 10.0 |
|              | BRMA   | <i>Briza maxima</i>             | 33  | 4.0 | 3.0 | 5.0  |
|              | GAPH2  | <i>Gastridium phleoides</i>     | 33  | 1.1 | 0.2 | 2.0  |
|              | AVBA   | <i>Avena barbata</i>            | 33  | 0.6 | 0.2 | 1.0  |
|              | CYEC   | <i>Cynosurus echinatus</i>      | 33  | 0.6 | 0.2 | 1.0  |
|              | CHPO3  | <i>Chlorogalum pomeridianum</i> | 33  | 0.2 | 0.2 | 0.2  |
| Non-vascular |        |                                 |     |     |     |      |
|              | 2MOSS  | Moss                            | 83  | 2.1 | 0.2 | 5.0  |
|              | 2LICHN | Lichen                          | 83  | 0.8 | 0.2 | 3.0  |

***Adenostoma fasciculatum* – *Arctostaphylos stanfordiana* / *Salvia sonomensis*  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (12) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 63.3         | 35–90         | –          |
| Herb                          | 22.6         | 1–50          | <0.5–0.5   |
| Shrub                         | 53.6         | 22–85         | 1–5        |
| Regenerating/understory tree* | 0.5          | 0–2           | 1–5        |
| Hardwood                      | 1.3          | 0–5           | 2–10       |
| Conifer                       | 0.4          | 0–3           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), SE (4), SW (6)

**Macrotopography:** lower 1/3 of slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (3), middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (5)

**Microtopography:** concave (2), convex (6), undulating (3)

**Parent material:** basalt (1), rhyolite (2), sandstone (1), volcanic (8)

**Soil texture:** clay or clay loam (4), loam or sandy loam (1), sand (1)

**Slope steepness:** moderate/6–25° (11), steep/>25° (1)

|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1251 ft. | 671–1770 ft. |
| Slope             | 17.1°    | 7–32°        |
| Large rock cover  | 5.8%     | 0–18%        |
| Small rock cover  | 22.5%    | 6–60%        |
| Bare ground cover | 34.1%    | 10–60%       |
| Litter cover      | 35.8%    | 10–55%       |

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**Samples Used to Describe Association** (n=12)

**Rapid Assessments:** MILOB001, MILOB003, MILOB008, MILOB012, SONO0175, SONO0179, SONO0205, SONO0692, SONO0707, SONO0809, SONO0834, SONO2212

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Adenostoma fasciculatum* – *Arctostaphylos stanfordiana* / *Salvia sonomensis* Provisional Association**

n = 12

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            | UMCA   | * <i>Umbellularia californica</i>                   | 25  | 1.4  | 0.2  | 3.0  |
| <b>Regenerating or Understory Tree</b> | UMCA   | * <i>Umbellularia californica</i>                   | 67  | 1.3  | 0.2  | 3.0  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           | ADFA   | <i>Adenostoma fasciculatum</i>                      | 100 | 27.8 | 13.0 | 45.0 |
|  | ARST   | <i>Arctostaphylos stanfordiana</i>                  | 83  | 2.8  | 1.0  | 6.0  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 50  | 11.0 | 0.2  | 35.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 50  | 3.4  | 0.2  | 10.0 |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 50  | 1.6  | 0.2  | 5.0  |
|  | QUDU4  | <i>Quercus durata</i>                               | 42  | 4.5  | 0.2  | 15.0 |
|  | QUBE5  | <i>Quercus berberidifolia</i>                       | 33  | 3.6  | 0.2  | 5.0  |
|  | ARCA5  | <i>Arctostaphylos canescens</i>                     | 33  | 2.8  | 0.2  | 5.0  |
|  | CEFO   | <i>Ceanothus foliosus</i>                           | 33  | 2.1  | 0.2  | 7.0  |
|  | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>     | 33  | 1.8  | 1.0  | 4.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 25  | 11.7 | 0.2  | 25.0 |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                    | 25  | 5.7  | 2.0  | 13.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 25  | 2.7  | 2.0  | 3.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                     | 25  | 1.3  | 1.0  | 2.0  |
|  | CESO   | <i>Ceanothus sonomensis</i>                         | 25  | 0.7  | 0.2  | 1.0  |
| <b>Herb</b>                            | SASO   | <i>Salvia sonomensis</i>                            | 83  | 19.8 | 4.0  | 45.0 |
|  | BRDI2  | <i>Brachypodium distachyon</i>                      | 42  | 10.2 | 0.2  | 25.0 |
|  | PEMU   | <i>Pellaea mucronata</i>                            | 33  | 0.4  | 0.2  | 1.0  |
|  | HYCO3  | <i>Hypericum concinnum</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|  | AVBA   | <i>Avena barbata</i>                                | 25  | 0.7  | 0.2  | 1.0  |
| <b>Non-vascular</b>                    | 2MOSS  | Moss  | 58  | 2.8  | 0.2  | 10.0 |
|  | 2LICHN | Lichen  | 58  | 2.4  | 0.2  | 7.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**Noteworthy Taxa**

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Adenostoma fasciculatum* – *Diplacus aurantiacus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 60            | –          |
| <b>Herb</b>                          | 1.0          | 1             | <0.5–0.5   |
| <b>Shrub</b>                         | 60.0         | 60            | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | 2–5        |
| <b>Hardwood</b>                      | 0.2          | 0.2           | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (1)

**Macrotopography:** Middle to Upper 1/3 of slope (1)

**Microtopography:** convex (1)

**Parent material:** Franciscan melange (1)

**Soil texture:** sand (1)

**Slope steepness:** steep/>25° (1)

|                          | Mean     | Range    |
|--------------------------|----------|----------|
| <b>Elevation</b>         | 1449 ft. | 1449 ft. |
| <b>Slope</b>             | 26.0°    | 26°      |
| <b>Large rock cover</b>  | 0.2%     | 0.2%     |
| <b>Small rock cover</b>  | 54.2%    | 54.2%    |
| <b>Bare ground cover</b> | 40.0%    | 40%      |
| <b>Litter cover</b>      | 3.0%     | 3%       |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0693

**Relevés:** none

**SCV Global/State Rank:** G4?/S4?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Adenostoma fasciculatum* – *Diplacus aurantiacus* Association**

n = 1

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | 2SNAG  | Standing snag                                       | 100 | 2.0  | 2.0  | 2.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 100 | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PIPO   | <i>Pinus ponderosa</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 100 | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 100 | 50.0 | 50.0 | 50.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 100 | 7.0  | 7.0  | 7.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 100 | 5.0  | 5.0  | 5.0  |
|  | FRCA12 | <i>Frangula californica</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | ERNU3  | <i>Eriogonum nudum</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|  | MOVI2  | <i>Monardella villosa</i>                           | 100 | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Adenostoma fasciculatum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (5), Coastal Franciscan/263Ag (2), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 59.1         | 30–81         | –          |
| <b>Herb</b>                          | 1.6          | 0–6           | <0.5–1     |
| <b>Shrub</b>                         | 58.5         | 30–80         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.8          | 0–6           | <0.5–5     |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 2–10       |
| <b>Conifer</b>                       | 0.7          | 0–5           | 10–20      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (4), SW (3), variable (1)

**Macrotopography:** middle 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (4), upper 1/3 of slope to ridgetop (2)

**Microtopography:** concave (1), convex (5), undulating (2)

**Parent material:** conglomerate (1), Franciscan melange (3), greenstone (1), sandstone (2), volcanic (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1)

**Slope steepness:** moderate/6–25° (5), steep/>25° (3)

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|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1541 ft. | 561–3809 ft. |
| Slope             | 25.3°    | 17–40°       |
| Large rock cover  | 5.2%     | 0–20%        |
| Small rock cover  | 22.9%    | 2–65%        |
| Bare ground cover | 40.4%    | 2–68%        |
| Litter cover      | 29.1%    | 2–92%        |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** SONO0011, SONO0046, SONO0052, SONO0065, SONO0617, SONO0641, SONO0862, SONO0990

**Relevés:** none

**SCV Global/State Rank:** G5/S5<sup>1</sup>

**STAND TABLE**

***Adenostoma fasciculatum* Association**

n = 8

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 38  | 0.5  | 0.2  | 1.0  |
|  | PISA2  | <i>Pinus sabiniana</i>                              | 25  | 3.0  | 1.0  | 5.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                          | 38  | 0.3  | 0.2  | 0.4  |
|  | UMCA   | <i>Umbellularia californica</i>                     | 25  | 2.2  | 0.2  | 4.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 100 | 54.9 | 26.0 | 80.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 50  | 0.7  | 0.2  | 2.0  |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 38  | 1.4  | 0.2  | 2.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 38  | 1.1  | 0.2  | 3.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 38  | 0.5  | 0.2  | 1.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                     | 25  | 3.1  | 0.2  | 6.0  |
|  | ARCTO3 | <i>Arctostaphylos</i>                               | 25  | 0.6  | 0.2  | 1.0  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AVBA   | <i>Avena barbata</i>                                | 25  | 1.5  | 1.0  | 2.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 25  | 1.1  | 0.2  | 2.0  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 38  | 2.5  | 0.2  | 7.0  |
|  | 2LICHN | Lichen  | 38  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

## ***Adenostoma fasciculatum* Serpentine Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) and Coastal Franciscan/263Ag (2) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 58.0                | 40–70                | –                 |
| <b>Herb</b>                          | 1.8                 | 0–5                  | <0.5–1            |
| <b>Shrub</b>                         | 52.0                | 35–61                | 1–2               |
| <b>Regenerating/understory tree*</b> | 1.7                 | 0–5                  | 2–5               |
| <b>Hardwood</b>                      | 0.1                 | 0–0                  | 2–5               |
| <b>Conifer</b>                       | 0.3                 | 0–1                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** SE (2), SW (2)

**Macrotopography:** Middle 1/3 of slope (1), Middle to Upper 1/3 of slope (2), Upper 1/3 of slope (1)

**Microtopography:** concave (1), convex (1), undulating (1)

**Parent material:** Metasedimentary (1), Serpentine (3)

**Soil texture:** clay or clay loam (3)

**Slope steepness:** steep/>25° (4)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 1790 ft.    | 254–3118 ft. |
| <b>Slope</b>             | 29.0°       | 26–31°       |
| <b>Large rock cover</b>  | 7.7%        | 0–15%        |
| <b>Small rock cover</b>  | 39.7%       | 30–49%       |
| <b>Bare ground cover</b> | 29.7%       | 20–39%       |
| <b>Litter cover</b>      | 20.7%       | 14–28%       |

### **Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SERP0008, SONO0042, SONO0049, SONO0148

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

### **STAND TABLE**

#### ***Adenostoma fasciculatum* Serpentine Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Tree</b>     |             |                                   |            |            |            |            |
|                 | UMCA        | <i>Umbellularia californica</i>   | 50         | 5.0        | 4.0        | 6.0        |
|                 | QUERC       | <i>Quercus</i>                    | 25         | 2.0        | 2.0        | 2.0        |
|                 | HESA17      | * <i>Hesperocyparis sargentii</i> | 25         | 1.0        | 1.0        | 1.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Adenostoma fasciculatum* Serpentine Association**

n = 4

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | AECA   | <i>Aesculus californica</i>                         | 25  | 1.0  | 1.0  | 1.0  |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                   | 25  | 1.0  | 1.0  | 1.0  |
|  | QUAG   | <i>Quercus agrifolia</i>                            | 25  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 100 | 35.5 | 23.0 | 55.0 |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 75  | 4.3  | 1.0  | 9.0  |
|  | CECU   | <i>Ceanothus cuneatus</i>                           | 50  | 12.5 | 9.0  | 16.0 |
|  | QUDU4  | <i>Quercus durata</i>                               | 50  | 4.5  | 2.0  | 7.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 50  | 1.6  | 0.2  | 3.0  |
|  | ARCTO3 | <i>Arctostaphylos</i>                               | 25  | 10.0 | 10.0 | 10.0 |
|  | GAFR   | <i>Garrya fremontii</i>                             | 25  | 8.0  | 8.0  | 8.0  |
|  | ARVI4  | <i>Arctostaphylos viscida</i>                       | 25  | 5.0  | 5.0  | 5.0  |
|  | ERIOD  | <i>Eriodictyon</i>                                  | 25  | 4.0  | 4.0  | 4.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                     | 25  | 4.0  | 4.0  | 4.0  |
|  | ARBA4  | <i>Arctostaphylos bakeri</i>                        | 25  | 2.0  | 2.0  | 2.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 25  | 1.0  | 1.0  | 1.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                           | 25  | 1.0  | 1.0  | 1.0  |
|  | GAEL   | <i>Garrya elliptica</i>                             | 25  | 1.0  | 1.0  | 1.0  |
|  | CEJE   | <i>Ceanothus jepsonii</i>                           | 25  | 1.0  | 1.0  | 1.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 25  | 2.0  | 2.0  | 2.0  |
|  | AVBA   | <i>Avena barbata</i>                                | 25  | 2.0  | 2.0  | 2.0  |
|  | COTEC  | <i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>   | 25  | 1.0  | 1.0  | 1.0  |
|  | PEMU   | <i>Pellaea mucronata</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|  | FEID   | <i>Festuca idahoensis</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | VUBR   | <i>Vulpia bromoides</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|  | TRLA5  | <i>Trichostema laxum</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|  | STACH  | <i>Stachys</i>                                      | 25  | 0.2  | 0.2  | 0.2  |
|  | PETR7  | <i>Pentagramma triangularis</i>                     | 25  | 0.2  | 0.2  | 0.2  |
|  | BRMA   | <i>Briza maxima</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | GACAC  | <i>Galium californicum</i> ssp. <i>californicum</i> | 25  | 0.2  | 0.2  | 0.2  |
|  | MELIC  | <i>Melica</i>                                       | 25  | 0.2  | 0.2  | 0.2  |
|  | ERIOG  | <i>Eriogonum</i>                                    | 25  | 0.2  | 0.2  | 0.2  |
|  | BRMA3  | <i>Bromus madritensis</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | MECA2  | <i>Melica californica</i>                           | 25  | 0.2  | 0.2  | 0.2  |

**Noteworthy Taxa**

*Cordylanthus tenuis* ssp. *capillaris*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4G5T1/S1

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Arctostaphylos (bakeri, montana) Provisional Alliance***  
**Baker or Mount Tamalpais manzanita chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Arctostaphylos bakeri* or *A. montana* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Ceanothus cuneatus*, *Ceanothus jepsonii*, *Diplacus aurantiacus*, *Eriodictyon californicum*, *Frangula californica* ssp. *tomentella*, *Garrya elliptica*, *Heteromeles arbutifolia*, *Quercus durata*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Hesperocyparis sargentii*, *Pseudotsuga menziesii*, *Quercus wislizeni*, or *Umbellularia californica*.

*Arctostaphylos bakeri* ssp. *bakeri* and *A. bakeri* ssp. *sublaevis* are serpentine endemics; they are listed as California rare plants with ranks of 1B.1 and 1B.2, respectively. Both are restricted to serpentine outcrops in the lower North Coast Ranges of Sonoma County (Best et al. 1996). Stands of *Arctostaphylos montana* ssp. *montana* and *A. montana* ssp. *ravenii* are not found in Sonoma County; they are only known to occur in Marin and San Francisco Counties, respectively, but are similar in setting and composition to *Arctostaphylos bakeri* stands.

Sonoma County

*Arctostaphylos bakeri* stands in Sonoma County are localized in two places: the Harrison Grade-Camp Meeker area southeast of Monte Rio on the Russian River and The Cedars, where ssp. *sublaevis* occurs. The stands at both The Cedars and Harrison Grade tend to be on upper slopes adjacent to *Hesperocyparis sargentii* Alliance stands.

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**Local Alliance Summary (n = 9)**

**Elevation:** 333–1460 ft, mean 863 ft

**SCV Global/State Rank:** G2/S2<sup>2</sup>

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe global/state rank: G2T1/S1

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2T2/S2

*Calochortus raichei*

CA rare plant rank: 1B.2

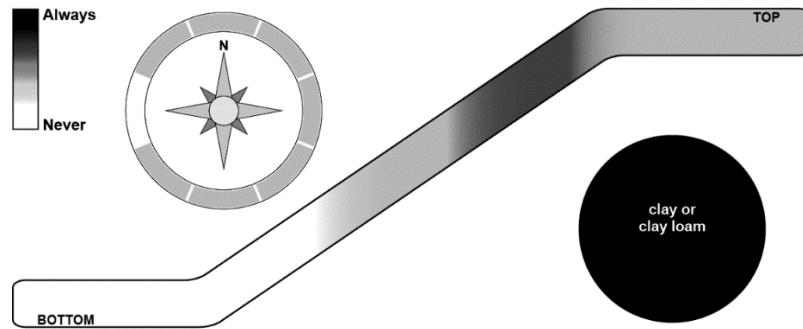
NatureServe global/state rank: G2/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.9         | 34–88         | –          |
| <b>Herb</b>                          | 2.3          | 0–5           | <0.5–1     |
| <b>Shrub</b>                         | 52.3         | 33–85         | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 0.4          | 0–2           | 1–10       |
| <b>Hardwood</b>                      | 0.2          | 0–1           | 2–15       |
| <b>Conifer</b>                       | 1.0          | 0–4           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 21.3° | 10–32° |
| <b>Large rock cover</b>  | 11.9% | 0–30%  |
| <b>Small rock cover</b>  | 33.0% | 8–62%  |
| <b>Bare ground cover</b> | 14.4% | 2–60%  |
| <b>Litter cover</b>      | 38.6% | 4–55%  |

**Associations within this Alliance:**

*Arctostaphylos bakeri* Provisional Association

**STAND TABLE**

***Arctostaphylos (bakeri, montana)* Provisional Alliance**

n = 9

| Lifeform                               | Code   | Botanical Name                    | Con | Avg | Min | Max  |
|--|--------|-----------------------------------|-----|-----|-----|------|
| <b>Tree</b>                            |        |                                   |     |     |     |      |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 44  | 1.8 | 0.2 | 4.0  |
|  | UMCA   | * <i>Umbellularia californica</i> | 22  | 0.6 | 0.2 | 1.0  |
|  | QUAG   | <i>Quercus agrifolia</i>          | 22  | 0.2 | 0.2 | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |     |     |      |
|  | UMCA   | * <i>Umbellularia californica</i> | 22  | 1.1 | 0.2 | 2.0  |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 22  | 0.2 | 0.2 | 0.2  |
| <b>Shrub</b>                           |        |                                   |     |     |     |      |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>    | 78  | 3.2 | 0.2 | 13.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Arctostaphylos (bakeri, montana)* Provisional Alliance**

n = 9

| Lifeform            | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Shrub</b>        |        |   |     |      |      |      |
|                     | CEJE   | <i>Ceanothus jepsonii</i>                           | 67  | 3.9  | 0.2  | 7.0  |
|                     | ARBA4  | * <i>Arctostaphylos bakeri</i>                      | 56  | 36.0 | 14.0 | 81.0 |
|                     | ARBAB  | * <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i>   | 33  | 52.3 | 32.0 | 65.0 |
|                     | QUDU4  | <i>Quercus durata</i>                               | 33  | 21.3 | 8.0  | 32.0 |
|                     | FRCA12 | <i>Frangula californica</i>                         | 33  | 0.7  | 0.2  | 1.0  |
|                     | GAEL   | <i>Garrya elliptica</i>                             | 22  | 4.0  | 3.0  | 5.0  |
|                     | ADFA   | <i>Adenostoma fasciculatum</i>                      | 22  | 1.1  | 0.2  | 2.0  |
|                     | RHIL   | <i>Rhamnus ilicifolia</i>                           | 22  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | METO   | <i>Melica torreyana</i>                             | 56  | 1.9  | 0.2  | 5.0  |
|                     | IRMA   | <i>Iris macrosiphon</i>                             | 33  | 0.8  | 0.2  | 2.0  |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i>                     | 33  | 0.7  | 0.2  | 1.0  |
|                     | CAOP2  | <i>Calamagrostis ophitidis</i>                      | 33  | 0.5  | 0.2  | 1.0  |
|                     | GACAC  | <i>Galium californicum</i> ssp. <i>californicum</i> | 33  | 0.2  | 0.2  | 0.2  |
|                     | CAREX  | <i>Carex</i>  | 22  | 3.5  | 3.0  | 4.0  |
|                     | CAGL7  | <i>Carex globosa</i>                                | 22  | 0.6  | 0.2  | 1.0  |
|                     | AGPA8  | <i>Agrostis pallens</i>                             | 22  | 0.2  | 0.2  | 0.2  |
|                     | ASDE6  | <i>Aspidotis densa</i>                              | 22  | 0.2  | 0.2  | 0.2  |
|                     | GALIU  | <i>Galium</i>                                       | 22  | 0.2  | 0.2  | 0.2  |
|                     | GAPO   | <i>Galium porrigens</i>                             | 22  | 0.2  | 0.2  | 0.2  |
|                     | POCA5  | <i>Polygala californica</i>                         | 22  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2MOSS  | Moss  | 44  | 1.4  | 0.2  | 5.0  |
|                     | 2LICHN | Lichen  | 22  | 0.2  | 0.2  | 0.2  |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G2T1/S1

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

*Calochortus raichei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Arctostaphylos bakeri* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (9) USDA Ecological Subsection (Miles and Goudey 1997).



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.9         | 34–88         | –          |
| <b>Herb</b>                          | 2.3          | 0–5           | <0.5–1     |
| <b>Shrub</b>                         | 52.3         | 33–85         | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 0.4          | 0–2           | 1–10       |
| <b>Hardwood</b>                      | 0.2          | 0–1           | 2–15       |
| <b>Conifer</b>                       | 1.0          | 0–4           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (2), SE (2), SW (4)

**Macrotopography:** middle 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (5), upper 1/3 of slope to ridgetop (2)

**Microtopography:** concave (1), convex (4), flat (1), undulating (3)

**Parent material:** peridotite (1), serpentine (8)

**Soil texture:** clay or clay loam (4)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (5), steep/>25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 863 ft. | 333–1460 ft. |
| <b>Slope</b>             | 21.3°   | 10–32°       |
| <b>Large rock cover</b>  | 11.9%   | 0–30%        |
| <b>Small rock cover</b>  | 33.0%   | 8–62%        |
| <b>Bare ground cover</b> | 14.4%   | 2–60%        |
| <b>Litter cover</b>      | 38.6%   | 4–55%        |

**Samples Used to Describe Association (n=9)**

**Rapid Assessments:** SERP0002, SERP0005, SONO0141, SONO0143, SONO0241, SONO0302, SONO0503, SONO0504, SONO2020

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Arctostaphylos bakeri* Provisional Association**

n = 9

| Lifeform                               | Code   | Botanical Name                    | Con | Avg | Min | Max |
|--|--------|-----------------------------------|-----|-----|-----|-----|
| <b>Tree</b>                            |        |                                   |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 44  | 1.8 | 0.2 | 4.0 |
|  | UMCA   | * <i>Umbellularia californica</i> | 22  | 0.6 | 0.2 | 1.0 |
|  | QUAG   | <i>Quercus agrifolia</i>          | 22  | 0.2 | 0.2 | 0.2 |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |     |     |     |
|  | UMCA   | * <i>Umbellularia californica</i> | 22  | 1.1 | 0.2 | 2.0 |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 22  | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

**Arctostaphylos bakeri Provisional Association**

n = 9

| Lifeform            | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Shrub</b>        |        |   |     |      |      |      |
|                     | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 78  | 3.2  | 0.2  | 13.0 |
|                     | CEJE   | <i>Ceanothus jepsonii</i>                           | 67  | 3.9  | 0.2  | 7.0  |
|                     | ARBA4  | * <i>Arctostaphylos bakeri</i>                      | 56  | 36.0 | 14.0 | 81.0 |
|                     | ARBAB  | * <i>Arctostaphylos bakeri</i> ssp. <i>bakeri</i>   | 33  | 52.3 | 32.0 | 65.0 |
|                     | QUDU4  | <i>Quercus durata</i>                               | 33  | 21.3 | 8.0  | 32.0 |
|                     | FRCA12 | <i>Frangula californica</i>                         | 33  | 0.7  | 0.2  | 1.0  |
|                     | GAEL   | <i>Garrya elliptica</i>                             | 22  | 4.0  | 3.0  | 5.0  |
|                     | ADFA   | <i>Adenostoma fasciculatum</i>                      | 22  | 1.1  | 0.2  | 2.0  |
|                     | RHIL   | <i>Rhamnus ilicifolia</i>                           | 22  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | METO   | <i>Melica torreyana</i>                             | 56  | 1.9  | 0.2  | 5.0  |
|                     | IRMA   | <i>Iris macrosiphon</i>                             | 33  | 0.8  | 0.2  | 2.0  |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i>                     | 33  | 0.7  | 0.2  | 1.0  |
|                     | CAOP2  | <i>Calamagrostis ophitidis</i>                      | 33  | 0.5  | 0.2  | 1.0  |
|                     | GACAC  | <i>Galium californicum</i> ssp. <i>californicum</i> | 33  | 0.2  | 0.2  | 0.2  |
|                     | CAREX  | <i>Carex</i>  | 22  | 3.5  | 3.0  | 4.0  |
|                     | CAGL7  | <i>Carex globosa</i>                                | 22  | 0.6  | 0.2  | 1.0  |
|                     | POCA5  | <i>Polygala californica</i>                         | 22  | 0.2  | 0.2  | 0.2  |
|                     | GAPO   | <i>Galium porrigens</i>                             | 22  | 0.2  | 0.2  | 0.2  |
|                     | GALIU  | <i>Galium</i>                                       | 22  | 0.2  | 0.2  | 0.2  |
|                     | AGPA8  | <i>Agrostis pallens</i>                             | 22  | 0.2  | 0.2  | 0.2  |
|                     | ASDE6  | <i>Aspidotis densa</i>                              | 22  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2MOSS  | Moss  | 44  | 1.4  | 0.2  | 5.0  |
|                     | 2LICHN | Lichen  | 22  | 0.2  | 0.2  | 0.2  |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *bakeri*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G2T1/S1

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

*Calochortus raichei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Arctostaphylos (canescens, manzanita, stanfordiana)* Provisional Alliance**  
Hoary, common, and Stanford manzanita chaparral

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Arctostaphylos canescens*, *A. manzanita* and/or *A. stanfordiana* dominate or co-dominate in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos auriculata*, *Arctostaphylos glandulosa*, *Arctostaphylos stanfordiana*, *Arctostaphylos viscida*, *Baccharis pilularis*, *Ceanothus* spp., *Diplacus aurantiacus*, *Eriodictyon californicum*, *Heteromeles arbutifolia*, *Lotus scoparius*, *Pickeringia montana*, *Quercus berberidifolia*, and *Quercus wislizeni*. Emergent trees may be present at low cover, including *Pinus attenuata*, *Pseudotsuga menziesii*, *Quercus chrysolepis*, *Quercus douglasii*, or *Quercus wislizeni*.

*Arctostaphylos canescens* appears as a dominant or co-dominant with other chaparral species, forming small stands within a matrix of chaparral and conifers.

*Arctostaphylos manzanita* is a variable species with six subspecies: ssp. *elegans*, ssp. *glaucescens*, ssp. *laevigata*, ssp. *manzanita*, ssp. *roofii*, and ssp. *wieslanderii* (Parker et al. 2007, 2012). The most widely ranging subspecies is ssp. *manzanita*, and it occurs in many chaparral and woodland types. The other subspecies have smaller ranges. This alliance includes stands of ssp. *laevigata* and ssp. *manzanita*.

*Arctostaphylos stanfordiana* has three subspecies, two of which, ssp. *decumbens* and ssp. *raichei*, are listed as California rare plants with a rank of 1B.1. *Arctostaphylos stanfordiana* ssp. *decumbens* is low in stature and is endemic to the southern North Coast Ranges in Sonoma County at around 100 m elevation. *Arctostaphylos stanfordiana* ssp. *stanfordiana* is larger in size and wider-ranging, found in both southern and central North Coast Ranges up to 1300 m elevation. The third subspecies, ssp. *raichei*, with finely hairy and glandular leaves, is more restricted in the central North Coast Ranges in Lake and Mendocino Counties. Stands of *Arctostaphylos stanfordiana* are threatened by development, invasive species, road and trail construction, vehicles, and viticulture.

Sonoma County

Most stands of *Arctostaphylos manzanita* are small and are usually topographically associated with upper slopes in transitional settings between grassland and oak woodland. Evidence of recent fire or clearing disturbance is common in these stands. This suggests that *A. manzanita* typically acts as an individual species, associated with local disturbance (clearing, fire, etc.) in *Quercus garryana* woodlands or mixed Douglas-fir – oak woodlands, and only rarely forms significant stands in the county.

In contrast, most pure or mixed stands of *Arctostaphylos stanfordiana* and *A. canescens* are larger and tend to associate with extensive old growth chaparral and associated stands of closed-cone conifers or *Pinus sabiniana*, thus suggesting that these species are largely part of the persistent chaparral ecosystem in the county. If these patterns persist in future data, we suggest segregating the *Arctostaphylos manzanita* stands into a separate alliance, keeping *A. canescens* and *A. stanfordiana* together as a single alliance.

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**Local Alliance Summary (n = 25)**

**Elevation:** 372–3826 ft, mean 1298 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Noteworthy Taxa**

*Arctostaphylos stanfordiana* ssp. *decumbens*

CA rare plant rank: 1B.1

NatureServe global/state rank: G3T1/S1

*Ceanothus confusus*

CA rare plant rank: 1B.1

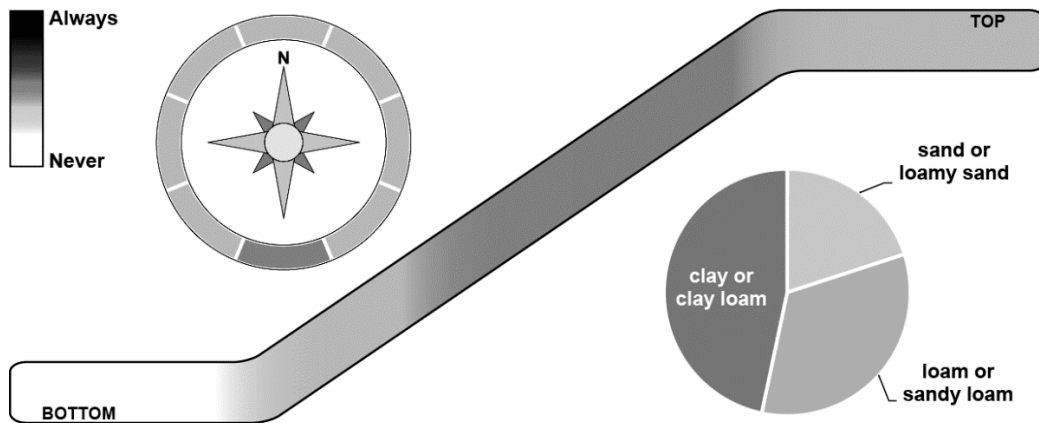
NatureServe global/state rank: G1/S1

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 54.5         | 15–94         | –          |
| <b>Herb</b>                          | 9.6          | 0–45          | <0.5–1     |
| <b>Shrub</b>                         | 47.4         | 12–90         | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.3          | 0–20          | <0.5–10    |
| <b>Hardwood</b>                      | 1.1          | 0–6           | 2–15       |
| <b>Conifer</b>                       | 1.5          | 0–8           | 2–35       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 15.4° | 2–30° |
| <b>Large rock cover</b>  | 4.8%  | 0–60% |
| <b>Small rock cover</b>  | 14.4% | 0–40% |
| <b>Bare ground cover</b> | 27.4% | 1–71% |
| <b>Litter cover</b>      | 52.0% | 5–90% |

**Associations within this Alliance:**

*Arctostaphylos canescens* Provisional Association

*Arctostaphylos manzanita* Provisional Association

*Arctostaphylos stanfordiana* Provisional Association

**STAND TABLE**

**Arctostaphylos (canescens, manzanita, stanfordiana) Provisional Alliance**

n = 25

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Tree</b>                            |        |   |     |      |     |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 28  | 1.8  | 0.2 | 5.0  |
|  | PIAT   | * <i>Pinus attenuata</i>                            | 20  | 4.4  | 2.0 | 8.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 28  | 0.7  | 0.2 | 1.2  |
|  | PIAT   | * <i>Pinus attenuata</i>                            | 20  | 5.1  | 0.2 | 20.2 |
|  | ARME   | <i>Arbutus menziesii</i>                            | 20  | 4.5  | 0.2 | 17.0 |
|  | QUAG   | <i>Quercus agrifolia</i>                            | 20  | 0.5  | 0.2 | 1.0  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 48  | 5.4  | 0.2 | 25.0 |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 44  | 31.2 | 1.0 | 90.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 44  | 1.8  | 0.2 | 8.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 36  | 1.4  | 0.2 | 3.0  |
|  | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>     | 36  | 1.0  | 0.2 | 3.0  |
|  | ARST   | <i>Arctostaphylos stanfordiana</i>                  | 32  | 28.1 | 2.0 | 57.0 |
|  | ARCA5  | <i>Arctostaphylos canescens</i>                     | 32  | 20.6 | 0.2 | 62.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 28  | 0.5  | 0.2 | 1.0  |
|  | CEFO   | <i>Ceanothus foliosus</i>                           | 24  | 1.1  | 0.2 | 3.0  |
|  | DERI   | <i>Dendromecon rigida</i>                           | 20  | 2.1  | 0.2 | 8.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 20  | 2.0  | 0.2 | 6.0  |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | SASO   | <i>Salvia sonomensis</i>                            | 20  | 7.6  | 1.0 | 20.0 |
|  | BRMA   | <i>Briza maxima</i>                                 | 20  | 7.3  | 0.2 | 30.0 |
|  | GAPH2  | <i>Gastridium phleoides</i>                         | 20  | 0.4  | 0.2 | 1.0  |
| <b>Non-vascular</b>                    |        |   |     |      |     |      |
|  | 2MOSS  | Moss  | 40  | 4.2  | 0.2 | 15.0 |
|  | 2LICHN | Lichen  | 20  | 1.1  | 0.2 | 3.0  |

**Noteworthy Taxa**

- Arctostaphylos stanfordiana* ssp. *decumbens*  
CA rare plant rank: 1B.1  
NatureServe Global/State rank: G3T1/S1
- Ceanothus confusus*  
CA rare plant rank: 1B.1  
NatureServe Global/State rank: G1/S1
- Ceanothus sonomensis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Arctostaphylos canescens Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (5) USDA Ecological Subsection (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 42.2         | 15–61         | –          |
| <b>Herb</b>                          | 1.3          | 0–5           | <0.5–0.5   |
| <b>Shrub</b>                         | 40.5         | 12–60         | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.6          | 0–3           | 2–5        |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 2–5        |
| <b>Conifer</b>                       | 2.8          | 0–8           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (3), SW (2)

**Macrotopography:** middle 1/3 of slope (1), ridge top (1), upper 1/3 of slope (3)

**Microtopography:** convex (3), undulating (2)

**Parent material:** andesite (1), ash (1), igneous (1), volcanic (2)

**Soil texture:** loam or sandy loam (2), sand (2)

**Slope steepness:** moderate/6–25° (5)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 1373 ft. | 1174–1722 ft. |
| <b>Slope</b>             | 17.4°    | 13–22°        |
| <b>Large rock cover</b>  | 17.0%    | 1–60%         |
| <b>Small rock cover</b>  | 25.4%    | 10–40%        |
| <b>Bare ground cover</b> | 14.2%    | 1–34%         |
| <b>Litter cover</b>      | 42.8%    | 17–62%        |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** MILOB002, MILOB005, MILOB011, SONO0810, SONO1107

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Arctostaphylos canescens* Provisional Association**

n = 5

| Lifeform                               | Code  | Botanical Name                  | Con | Avg | Min | Max |
|--|-------|---------------------------------|-----|-----|-----|-----|
| <b>Tree</b>                            |       |                                 |     |     |     |     |
|  | PIAT  | * <i>Pinus attenuata</i>        | 40  | 5.0 | 2.0 | 8.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>  | 40  | 2.0 | 1.0 | 3.0 |
|  | QUCH2 | <i>Quercus chrysolepis</i>      | 20  | 0.2 | 0.2 | 0.2 |
|  | UMCA  | <i>Umbellularia californica</i> | 20  | 0.2 | 0.2 | 0.2 |
| <b>Regenerating or Understory Tree</b> |       |                                 |     |     |     |     |
|  | PIAT  | * <i>Pinus attenuata</i>        | 40  | 1.1 | 0.2 | 2.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>  | 40  | 0.7 | 0.2 | 1.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

**Arctostaphylos canescens Provisional Association**

n = 5

| Lifeform            | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Shrub</b>        |        |   |     |      |      |      |
|                     | ARCA5  | * <i>Arctostaphylos canescens</i>                             | 80  | 37.8 | 6.0  | 62.0 |
|                     | ADFA   | <i>Adenostoma fasciculatum</i>                                | 80  | 1.9  | 0.2  | 5.0  |
|                     | ARST   | * <i>Arctostaphylos stanfordiana</i>                          | 60  | 2.0  | 2.0  | 2.0  |
|                     | DERI   | <i>Dendromecon rigida</i>                                     | 40  | 0.6  | 0.2  | 1.0  |
|                     | HEAR5  | <i>Heteromeles arbutifolia</i>                                | 40  | 0.6  | 0.2  | 1.0  |
|                     | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>               | 40  | 0.2  | 0.2  | 0.2  |
|                     | ARCAC7 | * <i>Arctostaphylos canescens</i> ssp. <i>canescens</i>       | 20  | 30.0 | 30.0 | 30.0 |
|                     | ARSTS  | * <i>Arctostaphylos stanfordiana</i> ssp. <i>stanfordiana</i> | 20  | 8.0  | 8.0  | 8.0  |
|                     | ARGL3  | * <i>Arctostaphylos glandulosa</i>                            | 20  | 1.0  | 1.0  | 1.0  |
|                     | CEFOF3 | <i>Ceanothus foliosus</i> var. <i>foliosus</i>                | 20  | 1.0  | 1.0  | 1.0  |
|                     | CESO   | <i>Ceanothus sonomensis</i>                                   | 20  | 1.0  | 1.0  | 1.0  |
|                     | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>                | 20  | 1.0  | 1.0  | 1.0  |
|                     | ARGLG3 | * <i>Arctostaphylos glandulosa</i> ssp. <i>glandulosa</i>     | 20  | 0.2  | 0.2  | 0.2  |
|                     | ERCA6  | <i>Eriodictyon californicum</i>                               | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | HYCO3  | <i>Hypericum concinnum</i>                                    | 40  | 0.2  | 0.2  | 0.2  |
|                     | GAPH2  | <i>Gastrium phleoides</i>                                     | 20  | 1.0  | 1.0  | 1.0  |
|                     | SASO   | <i>Salvia sonomensis</i>                                      | 20  | 1.0  | 1.0  | 1.0  |
|                     | VULPI  | <i>Vulpia</i>   | 20  | 0.2  | 0.2  | 0.2  |
|                     | ARDO3  | <i>Artemisia douglasiana</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|                     | VUMY   | <i>Vulpia myuros</i>  | 20  | 0.2  | 0.2  | 0.2  |
|                     | POCA5  | <i>Polygala californica</i>                                   | 20  | 0.2  | 0.2  | 0.2  |
|                     | PIPER2 | <i>Piperia</i>  | 20  | 0.2  | 0.2  | 0.2  |
|                     | NAVAR  | <i>Navarretia</i>   | 20  | 0.2  | 0.2  | 0.2  |
|                     | LOCA19 | <i>Logfia californica</i>                                     | 20  | 0.2  | 0.2  | 0.2  |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i>                               | 20  | 0.2  | 0.2  | 0.2  |
|                     | CAAM3  | <i>Calochortus amabilis</i>                                   | 20  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2MOSS  | Moss  | 20  | 15.0 | 15.0 | 15.0 |

**Noteworthy Taxa**

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Arctostaphylos manzanita Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (3), Coastal Franciscan/263Ag (5), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 54.6         | 28–94         | –          |
| <b>Herb</b>                          | 9.5          | 0–22          | <0.5–1     |
| <b>Shrub</b>                         | 45.2         | 22–90         | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.8          | 0–15          | <0.5–10    |
| <b>Hardwood</b>                      | 1.9          | 0–6           | 2–15       |
| <b>Conifer</b>                       | 0.3          | 0–2           | 5–35       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (2), SE (4), SW (3), variable (1)

**Macrotopography:** lower to middle 1/3 of slope (1), middle 1/3 of slope (3), middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (2), ridge top (1), upper 1/3 of slope (3)

**Microtopography:** concave (2), convex (6), flat (3)

**Parent material:** Franciscan melange (2), greenstone (1), mixed sedimentary (1), rhyolite (2), sandstone (1), serpentine (2), volcanic (2)

**Soil texture:** clay or clay loam (5), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (8), steep/>25° (1)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1156 ft. | 372–2206 ft. |
| <b>Slope</b>             | 13.7°    | 2–29°        |
| <b>Large rock cover</b>  | 1.5%     | 0–8%         |
| <b>Small rock cover</b>  | 12.0%    | 0–37%        |
| <b>Bare ground cover</b> | 32.9%    | 1–71%        |
| <b>Litter cover</b>      | 51.9%    | 5–90%        |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** SONO0073, SONO0180, SONO0188, SONO0262, SONO0386, SONO0469, SONO0532, SONO0605, SONO0698, SONO0700, SONO0819

**Relevés:** none

**SCV Global/State Rank:** G4?/S4?¹

**STAND TABLE**

***Arctostaphylos manzanita* Provisional Association**

n = 11

| Lifeform                        | Code  | Botanical Name             | Con | Avg | Min | Max  |
|---------------------------------|-------|----------------------------|-----|-----|-----|------|
| Tree                            | QUAG  | * <i>Quercus agrifolia</i> | 27  | 3.7 | 0.2 | 6.0  |
|                                 | 2SNAG | Standing snag              | 27  | 1.7 | 0.2 | 4.0  |
| Regenerating or Understory Tree | ARME  | <i>Arbutus menziesii</i>   | 45  | 4.5 | 0.2 | 17.0 |
|                                 | QUAG  | * <i>Quercus agrifolia</i> | 45  | 0.5 | 0.2 | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

**Arctostaphylos manzanita Provisional Association**

n = 11

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 36  | 0.7  | 0.2  | 1.2  |
|  | UMCA   | <i>Umbellularia californica</i>                     | 27  | 2.4  | 0.2  | 6.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                     | 73  | 42.1 | 10.0 | 90.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                      | 55  | 2.6  | 0.2  | 8.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 55  | 0.6  | 0.2  | 1.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 27  | 2.0  | 1.0  | 3.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | BRMA   | <i>Briza maxima</i>                                 | 27  | 1.8  | 0.2  | 5.0  |
|  | AVBA   | <i>Avena barbata</i>                                | 27  | 1.3  | 1.0  | 2.0  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                     | 27  | 0.5  | 0.2  | 1.0  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 64  | 3.7  | 0.2  | 15.0 |
|  | 2LICHN | Lichen  | 27  | 1.4  | 0.2  | 3.0  |

**Noteworthy Taxa**

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G1/S1

**Arctostaphylos stanfordiana Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (8) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 62.6         | 41–90         | –          |
| <b>Herb</b>                          | 10.4         | 0–28          | <0.5–1     |
| <b>Shrub</b>                         | 57.6         | 41–90         | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.9          | 0–20          | 1–5        |
| <b>Hardwood</b>                      | 0.4          | 0–2           | 2–10       |
| <b>Conifer</b>                       | 2.4          | 0–7           | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** Flat (1), SE (1), SW (5), variable (1)

**Macrotopography:** middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (2), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (2)

**Microtopography:** concave (1), convex (4), undulating (2)

**Parent material:** andesite (1), ash (1), basalt (1), rhyolite (2), volcanic (3)

**Soil texture:** clay or clay loam (1), loam or sandy loam (2), sand (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (3), steep/>25° (3)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1524 ft. | 613–3826 ft. |
| Slope             | 17.3°    | 2–30°        |
| Large rock cover  | 2.3%     | 0–6%         |
| Small rock cover  | 12.3%    | 0–40%        |
| Bare ground cover | 29.0%    | 5–68%        |
| Litter cover      | 55.1%    | 30–83%       |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** MILOB009, MILOB013, MILOB015, MILOB016, SONO0174, SONO0835, SONO0843, SONO1101

**Relevés:** none

**SCV Global/State Rank:** G2G3?/S2S3?<sup>1</sup>

**STAND TABLE**

***Arctostaphylos stanfordiana* Provisional Association**

n = 8

| Lifeform     | Code   | Botanical Name   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Tree</b>  |        |  |     |      |      |      |
|              | PIAT   | <i>Pinus attenuata</i>                                     | 38  | 4.0  | 2.0  | 7.0  |
|              | PSME   | <i>Pseudotsuga menziesii</i>                               | 25  | 3.5  | 2.0  | 5.0  |
| <b>Shrub</b> |        |  |     |      |      |      |
|              | ARST   | * <i>Arctostaphylos stanfordiana</i>                       | 63  | 43.8 | 32.0 | 57.0 |
|              | ADFA   | <i>Adenostoma fasciculatum</i>                             | 63  | 8.4  | 2.0  | 25.0 |
|              | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>            | 63  | 1.7  | 0.2  | 3.0  |
|              | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>        | 63  | 1.2  | 0.2  | 3.0  |
|              | CEFO   | <i>Ceanothus foliosus</i>                                  | 63  | 0.9  | 0.2  | 3.0  |
|              | ARCA5  | <i>Arctostaphylos canescens</i>                            | 50  | 3.3  | 0.2  | 5.0  |
|              | ERCA6  | <i>Eriodictyon californicum</i>                            | 38  | 3.5  | 0.2  | 10.0 |
|              | BAPI   | <i>Baccharis pilularis</i>                                 | 38  | 2.7  | 0.2  | 6.0  |
|              | HEAR5  | <i>Heteromeles arbutifolia</i>                             | 38  | 1.1  | 0.2  | 2.0  |
|              | ARSTD4 | * <i>Arctostaphylos stanfordiana</i> ssp. <i>decumbens</i> | 25  | 17.5 | 13.0 | 22.0 |
|              | ARMA   | <i>Arctostaphylos manzanita</i>                            | 25  | 2.5  | 1.0  | 4.0  |
|              | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>             | 25  | 1.5  | 1.0  | 2.0  |
|              | FRCAC5 | <i>Frangula californica</i> ssp. <i>californica</i>        | 25  | 1.1  | 0.2  | 2.0  |
|              | CECO6  | <i>Ceanothus confusus</i>                                  | 25  | 0.6  | 0.2  | 1.0  |
|              | ARGLG3 | <i>Arctostaphylos glandulosa</i> ssp. <i>glandulosa</i>    | 25  | 0.6  | 0.2  | 1.0  |
|              | DERI   | <i>Dendromecon rigida</i>                                  | 25  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>  |        |  |     |      |      |      |
|              | SASO   | <i>Salvia sonomensis</i>                                   | 50  | 9.3  | 1.0  | 20.0 |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>           | 25  | 3.5  | 3.0  | 4.0  |
|              | PHAQ   | <i>Phalaris aquatica</i>                                   | 25  | 2.1  | 0.2  | 4.0  |
|              | GAPH2  | <i>Gastroidium phleoides</i>                               | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Arctostaphylos stanfordiana* Provisional Association**

n = 8

| Lifeform            | Code   | Botanical Name | Con | Avg | Min | Max |
|---------------------|--------|----------------|-----|-----|-----|-----|
| <b>Non-vascular</b> |        |                |     |     |     |     |
|                     | 2MOSS  | Moss           | 25  | 0.6 | 0.2 | 1.0 |
|                     | 2LICHN | Lichen         | 25  | 0.6 | 0.2 | 1.0 |

**Noteworthy Taxa**

*Arctostaphylos stanfordiana* ssp. *decumbens*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G3T1/S1

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G1/S1

*Ceanothus sonomensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Arctostaphylos (nummularia, sensitiva) Alliance***  
**Glossy leaf manzanita chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Arctostaphylos nummularia* or *Arctostaphylos sensitiva* dominate or co-dominate in the shrub canopy with *Arctostaphylos columbiana*, *Arctostaphylos glandulosa* ssp. *glandulosa*, *Arctostaphylos virgata*, *Chrysolepis chrysophylla* var. *minor*, *Pickeringia montana*, *Pteridium aquilinum*, and *Vaccinium ovatum*. Emergent trees may be present at low cover, including *Pinus muricata*, *Pseudotsuga menziesii*, or *Sequoia sempervirens*.

Taxonomic treatments of the *Arctostaphylos nummularia* complex vary (Hickman 1993, McMinn 1939, Parker et al. 2007, 2012). Parker et al. recognize *Arctostaphylos sensitiva*, *A. nummularia* ssp. *nummularia*, and *A. nummularia* ssp. *mendocinoensis* based on bark and habit differences. *Arctostaphylos sensitiva* grows in Marin and Santa Cruz Counties and it is included in this alliance. *Arctostaphylos nummularia* occurs from Sonoma to Mendocino County. The more erect plants of this species, from 0.5 to 3 m tall with lower stems gray and shredding (ssp. *nummularia*), are also included in this alliance. The more prostrate plants, <0.5 meters tall with lower stems gray or reddish and shredding (ssp. *mendocinoensis*), are more often associated with stands of the *Hesperocyparis pygmaea* and *Pinus muricata* Alliances in Mendocino County.

Stands of this alliance are part of the maritime chaparral (see the maritime chaparral discussion in Sawyer et al. (2009)). The relationships between this and other maritime chaparral alliances and associations will be better understood after additional data has been collected and analyzed.

Sonoma County

Stands of the *Arctostaphylos (nummularia, sensitiva)* Alliance are only known from Gualala Ridge and are associated with very old oligotrophic marine terrace soils that also support *Pinus muricata* stands. Bishop pine and glossy-leaf manzanita are ecologically related in this area. *Arctostaphylos nummularia* stands may persist for many decades, or re-establish from seed banks, following the senescence and death of overstory *Pinus muricata*. In adjacent southern Mendocino County near Gualala, examples of the *Arctostaphylos nummularia* ssp. *nummularia* Association may occur adjacent to *Hesperocyparis pygmaea* stands.

Only two *Arctostaphylos (nummularia, sensitiva)* Alliance stands were sampled, both within 1 km of each other in Salt Point State Park. One of those was collected in the Pygmy Forest inventory (CDFW 2015) following the completion of data analysis for this project and is not discussed further in this report.

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**Local Alliance Summary (n = 1)**

**Elevation:** 973 ft

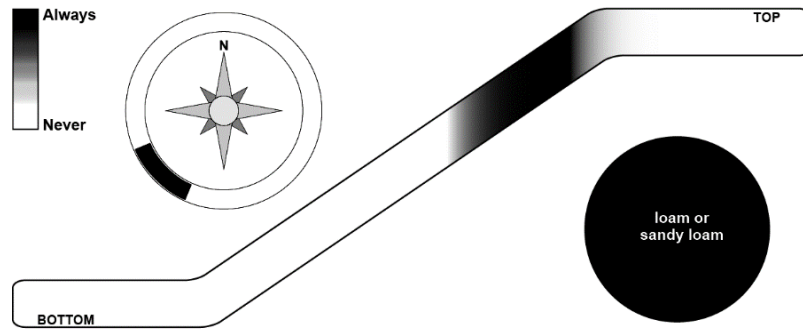
**SCV Global/State Rank:** G2/S2<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 60            | –          |
| <b>Herb</b>                          | 2.0          | 2             | 0.5–1      |
| <b>Shrub</b>                         | 56.0         | 56            | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 5.0          | 5             | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 3.0°  | 3°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 23.0% | 23%   |
| <b>Litter cover</b>      | 75.0% | 75%   |

**Associations within this Alliance:**

*Arctostaphylos nummularia* ssp. *nummularia* Provisional Association

**STAND TABLE**

***Arctostaphylos (nummularia, sensitiva)* Alliance**

n = 1

| Lifeform     | Code   | Botanical Name                                    | Con | Avg  | Min  | Max  |
|--------------|--------|---|-----|------|------|------|
| <b>Tree</b>  |        |   |     |      |      |      |
|              | PIMU   | <i>Pinus muricata</i>                             | 100 | 5.0  | 5.0  | 5.0  |
| <b>Shrub</b> |        |   |     |      |      |      |
|              | ARNU3  | <i>Arctostaphylos nummularia</i>                  | 100 | 35.0 | 35.0 | 35.0 |
|              | VAOV2  | <i>Vaccinium ovatum</i>                           | 100 | 15.0 | 15.0 | 15.0 |
|              | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i> | 100 | 3.0  | 3.0  | 3.0  |
|              | GASH   | <i>Gaultheria shallon</i>                         | 100 | 2.0  | 2.0  | 2.0  |
|              | ARCO3  | <i>Arctostaphylos columbiana</i>                  | 100 | 1.0  | 1.0  | 1.0  |
|              | HESC2  | <i>Helianthemum scoparium</i>                     | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  |        |   |     |      |      |      |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 100 | 1.0  | 1.0  | 1.0  |
|              | LOHU2  | <i>Lotus humistratus</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|              | LUZUL  | <i>Luzula</i>                                     | 100 | 0.2  | 0.2  | 0.2  |

**STAND TABLE** continued

***Arctostaphylos (nummularia, sensitiva) Alliance***

n = 1

| Lifeform            | Code   | Botanical Name | Con | Avg  | Min  | Max  |
|---------------------|--------|----------------|-----|------|------|------|
| <b>Non-vascular</b> |        |                |     |      |      |      |
|                     | 2MOSS  | Moss           | 100 | 30.0 | 30.0 | 30.0 |
|                     | 2LICHN | Lichen         | 100 | 10.0 | 10.0 | 10.0 |

***Arctostaphylos nummularia ssp. nummularia Provisional Association***

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 60            | –          |
| <b>Herb</b>                          | 2.0          | 2             | 0.5–1      |
| <b>Shrub</b>                         | 56.0         | 56            | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 5.0          | 5             | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (1)

**Macrotopography:** Upper 1/3 of slope (1)

**Microtopography:** convex (1)

**Parent material:** Mixed sedimentary (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 973 ft. | 973 ft. |
| <b>Slope</b>             | 3.0°    | 3°      |
| <b>Large rock cover</b>  | 0.0%    | 0%      |
| <b>Small rock cover</b>  | 0.0%    | 0%      |
| <b>Bare ground cover</b> | 23.0%   | 23%     |
| <b>Litter cover</b>      | 75.0%   | 75%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0465

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
 Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Arctostaphylos nummularia* ssp. *nummularia* Provisional Association**

n = 1

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>         |             |   |            |            |            |            |
|                     | PIMU        | <i>Pinus muricata</i>                             | 100        | 5.0        | 5.0        | 5.0        |
| <b>Shrub</b>        |             |   |            |            |            |            |
|                     | ARNU3       | <i>Arctostaphylos nummularia</i>                  | 100        | 35.0       | 35.0       | 35.0       |
|                     | VAOV2       | <i>Vaccinium ovatum</i>                           | 100        | 15.0       | 15.0       | 15.0       |
|                     | CHCHM       | <i>Chrysolepis chrysophylla</i> var. <i>minor</i> | 100        | 3.0        | 3.0        | 3.0        |
|                     | GASH        | <i>Gaultheria shallon</i>                         | 100        | 2.0        | 2.0        | 2.0        |
|                     | ARCO3       | <i>Arctostaphylos columbiana</i>                  | 100        | 1.0        | 1.0        | 1.0        |
|                     | HESC2       | <i>Helianthemum scoparium</i>                     | 100        | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>         |             |   |            |            |            |            |
|                     | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i>  | 100        | 1.0        | 1.0        | 1.0        |
|                     | LOHU2       | <i>Lotus humistratus</i>                          | 100        | 0.2        | 0.2        | 0.2        |
|                     | LUZUL       | <i>Luzula</i>                                     | 100        | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |   |            |            |            |            |
|                     | 2MOSS       | Moss  | 100        | 30.0       | 30.0       | 30.0       |
|                     | 2LICHN      | Lichen  | 100        | 10.0       | 10.0       | 10.0       |

***Arctostaphylos glandulosa* Alliance**  
**Eastwood manzanita chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Arctostaphylos glandulosa* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos glauca*, *Baccharis pilularis*, *Ceanothus crassifolius*, *Ceanothus cuneatus*, *Ceanothus greggii*, *Ceanothus leucodermis*, *Cercocarpus montanus*, *Eriogonum fasciculatum*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus wislizeni*, and *Rhus ovata*. Emergent trees may be present at low cover, including *Pinus attenuata*, *Pinus coulteri*, or *Quercus agrifolia*.

All forms of *Arctostaphylos glandulosa* are included in this alliance. Mixed stands formerly considered members of the *Adenostoma fasciculatum* – *Arctostaphylos glandulosa* Alliance (Gordon and White 1994, Sawyer and Keeler-Wolf 1995, Borchert et al. 2004) are now considered part of this alliance. This placement is based on ecological similarities between pure and mixed stands, which include slope position, elevation, and fire history.

The *Arctostaphylos glandulosa* Alliance tends to occur at middle or moderately high elevations in the central and southern Coast Ranges that regularly experience winter freezes. Stands often occur on upper hill slopes and they are particularly common on ridges in very well-drained settings. Stands at higher elevations and on ridges tend to be of short stature and weather-beaten.

Sonoma County

The five sampled *Arctostaphylos glandulosa* stands are widely scattered throughout the county, on convex ridgetops or upper slopes at about 1300 ft elevation. Although generally lower in elevation than similar stands in the central and south Coast Ranges (Borchert et al. 2004), the general slope position and exposure are consistent with typical state-wide landscape settings for this alliance. All Sonoma County stands are located inland or above the summer maritime air temperature inversion layer, suggesting hot and very dry summer conditions. Individuals of *Arctostaphylos glandulosa* are a minor component of some stands of *Pinus muricata* in coastal Sonoma County.

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**Local Alliance Summary (n = 5)**

**Elevation:** 781–1874 ft, mean 1282 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

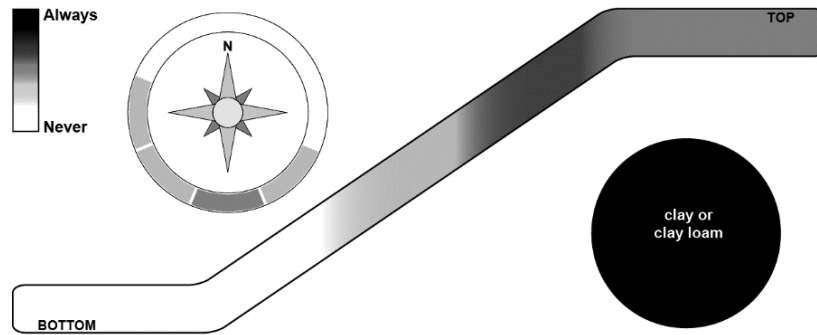
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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 66.6         | 32–95         | –          |
| <b>Herb</b>                          | 1.1          | 0–3           | <0.5–0.5   |
| <b>Shrub</b>                         | 66.2         | 32–92         | 1–5        |
| <b>Regenerating/understory tree*</b> | 1.3          | 0.2–5         | <0.5–5     |
| <b>Hardwood</b>                      | 1.6          | 0–6           | 2–5        |
| <b>Conifer</b>                       | 0.4          | 0–2           | 2–5        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 14.0° | 4–20°  |
| <b>Large rock cover</b>  | 4.2%  | 0–16%  |
| <b>Small rock cover</b>  | 14.0% | 1–61%  |
| <b>Bare ground cover</b> | 16.6% | 1–60%  |
| <b>Litter cover</b>      | 63.0% | 30–87% |

**Associations within this Alliance:**

- Arctostaphylos glandulosa* – *Adenostoma fasciculatum* Association
- Arctostaphylos glandulosa* Association

**STAND TABLE**

***Arctostaphylos glandulosa* Alliance**

n = 5

| Lifeform                               | Code  | Botanical Name                    | Con | Avg | Min | Max |
|--|-------|-----------------------------------|-----|-----|-----|-----|
| <b>Tree</b>                            |       |                                   |     |     |     |     |
|  | ARME  | * <i>Arbutus menziesii</i>        | 40  | 0.6 | 0.2 | 1.0 |
|  | QUWI2 | * <i>Quercus wislizeni</i>        | 20  | 4.0 | 4.0 | 4.0 |
|  | PSME  | <i>Pseudotsuga menziesii</i>      | 20  | 2.0 | 2.0 | 2.0 |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 20  | 2.0 | 2.0 | 2.0 |
|  | UMCA  | * <i>Umbellularia californica</i> | 20  | 1.0 | 1.0 | 1.0 |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |     |     |     |
|  | ARME  | * <i>Arbutus menziesii</i>        | 40  | 0.6 | 0.2 | 1.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

**Arctostaphylos glandulosa Alliance**

n = 5

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                                | 40  | 0.2  | 0.2  | 0.2  |
|  | QUPAS2 | <i>Quercus parvula</i> var. <i>shrevei</i>                | 20  | 5.0  | 5.0  | 5.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                         | 20  | 1.0  | 1.0  | 1.0  |
|  | QUWI2  | * <i>Quercus wislizeni</i>                                | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                          | 100 | 34.0 | 17.0 | 68.0 |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                            | 100 | 11.8 | 0.2  | 45.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                            | 60  | 0.7  | 0.2  | 1.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>       | 60  | 0.2  | 0.2  | 0.2  |
|  | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>            | 40  | 1.6  | 0.2  | 3.0  |
|  | CEFO   | <i>Ceanothus foliosus</i>                                 | 40  | 1.0  | 1.0  | 1.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                                | 40  | 0.2  | 0.2  | 0.2  |
|  | ARSTR  | * <i>Arctostaphylos stanfordiana</i> ssp. <i>raichei</i>  | 20  | 30.0 | 30.0 | 30.0 |
|  | ARMA   | * <i>Arctostaphylos manzanita</i>                         | 20  | 22.0 | 22.0 | 22.0 |
|  | ARST   | * <i>Arctostaphylos stanfordiana</i>                      | 20  | 21.0 | 21.0 | 21.0 |
|  | ARMAG  | * <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 20  | 7.0  | 7.0  | 7.0  |
|  | DERI   | <i>Dendromecon rigida</i>                                 | 20  | 2.0  | 2.0  | 2.0  |
|  | FRCA12 | <i>Frangula californica</i>                               | 20  | 2.0  | 2.0  | 2.0  |
|  | CECU   | <i>Ceanothus cuneatus</i>                                 | 20  | 1.0  | 1.0  | 1.0  |
|  | ERAR27 | <i>Ericameria arborescens</i>                             | 20  | 1.0  | 1.0  | 1.0  |
|  | ERCA6  | <i>Eriodictyon californicum</i>                           | 20  | 1.0  | 1.0  | 1.0  |
|  | QUBE5  | <i>Quercus berberidifolia</i>                             | 20  | 1.0  | 1.0  | 1.0  |
|  | QUWIF  | * <i>Quercus wislizeni</i> var. <i>frutescens</i>         | 20  | 1.0  | 1.0  | 1.0  |
|  | CEGLE  | <i>Ceanothus gloriosus</i> var. <i>exaltatus</i>          | 20  | 0.2  | 0.2  | 0.2  |
|  | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i>         | 20  | 0.2  | 0.2  | 0.2  |
|  | ERIOD  | <i>Eriodictyon</i>  | 20  | 0.2  | 0.2  | 0.2  |
|  | LOSC2  | <i>Lotus scoparius</i>                                    | 20  | 0.2  | 0.2  | 0.2  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                         | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AICA   | <i>Aira caryophyllea</i>                                  | 40  | 0.2  | 0.2  | 0.2  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|  | GAPH2  | <i>Gastidium phleoides</i>                                | 20  | 0.2  | 0.2  | 0.2  |
|  | HORKE  | <i>Horkelia</i>   | 20  | 0.2  | 0.2  | 0.2  |
|  | NAVAR  | <i>Navarretia</i>   | 20  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 80  | 3.0  | 2.0  | 5.0  |
|  | 2LICHN | Lichen  | 20  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Arctostaphylos glandulosa – Adenostoma fasciculatum Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (1), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 61.0         | 32–95         | –          |
| <b>Herb</b>                          | 1.1          | 0–3           | <0.5–0.5   |
| <b>Shrub</b>                         | 59.7         | 32–92         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.5          | 0.2–1         | <0.5–2     |
| <b>Hardwood</b>                      | 2.3          | 0–6           | 2–5        |
| <b>Conifer</b>                       | 0.7          | 0–2           | 2–5        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (2)

**Macrotopography:** ridge top (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (3)

**Parent material:** sandstone (1), shale (1), volcanic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1012 ft. | 781–1322 ft. |
| <b>Slope</b>             | 12.7°    | 4–18°        |
| <b>Large rock cover</b>  | 5.3%     | 0–16%        |
| <b>Small rock cover</b>  | 21.3%    | 1–61%        |
| <b>Bare ground cover</b> | 7.3%     | 4–10%        |
| <b>Litter cover</b>      | 64.7%    | 30–87%       |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0140, SONO0591, SONO1106

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

**Arctostaphylos glandulosa – Adenostoma fasciculatum Association**

n = 3

| Lifeform | Code  | Botanical Name             | Con | Avg | Min | Max |
|----------|-------|----------------------------|-----|-----|-----|-----|
| Tree     | QUWI2 | * <i>Quercus wislizeni</i> | 33  | 4.0 | 4.0 | 4.0 |
|          | QUAG  | * <i>Quercus agrifolia</i> | 33  | 2.0 | 2.0 | 2.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Arctostaphylos glandulosa* – *Adenostoma fasciculatum* Association**

n = 3

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PSME   | <i>Pseudotsuga menziesii</i>                              | 33  | 2.0  | 2.0  | 2.0  |
|  | ARME   | <i>Arbutus menziesii</i>                                  | 33  | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                                | 67  | 0.2  | 0.2  | 0.2  |
|  | QUWI2  | * <i>Quercus wislizeni</i>                                | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                            | 100 | 19.3 | 4.0  | 45.0 |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                          | 100 | 19.0 | 17.0 | 22.0 |
|  | ARMA   | * <i>Arctostaphylos manzanita</i>                         | 33  | 22.0 | 22.0 | 22.0 |
|  | ARST   | <i>Arctostaphylos stanfordiana</i>                        | 33  | 21.0 | 21.0 | 21.0 |
|  | ARMAG  | * <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 33  | 7.0  | 7.0  | 7.0  |
|  | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>            | 33  | 3.0  | 3.0  | 3.0  |
|  | DERI   | <i>Dendromecon rigida</i>                                 | 33  | 2.0  | 2.0  | 2.0  |
|  | QUWIF  | * <i>Quercus wislizeni</i> var. <i>frutescens</i>         | 33  | 1.0  | 1.0  | 1.0  |
|  | QUBE5  | <i>Quercus berberidifolia</i>                             | 33  | 1.0  | 1.0  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                            | 33  | 1.0  | 1.0  | 1.0  |
|  | CEFO   | <i>Ceanothus foliosus</i>                                 | 33  | 1.0  | 1.0  | 1.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>       | 33  | 0.2  | 0.2  | 0.2  |
|  | ERIOD  | <i>Eriodictyon</i>  | 33  | 0.2  | 0.2  | 0.2  |
|  | CHCHM  | <i>Chrysolepis chrysophylla</i> var. <i>minor</i>         | 33  | 0.2  | 0.2  | 0.2  |
|  | BAPI   | <i>Baccharis pilularis</i>                                | 33  | 0.2  | 0.2  | 0.2  |
|  | LOSC2  | <i>Lotus scoparius</i>                                    | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AICA   | <i>Aira caryophyllea</i>                                  | 67  | 0.2  | 0.2  | 0.2  |
|  | NAVAR  | <i>Navarretia</i>   | 33  | 0.2  | 0.2  | 0.2  |
|  | HORKE  | <i>Horkelia</i>   | 33  | 0.2  | 0.2  | 0.2  |
|  | GAPH2  | <i>Gastroidium phleoides</i>                              | 33  | 0.2  | 0.2  | 0.2  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                                  | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 67  | 3.5  | 2.0  | 5.0  |
|  | 2LICHN | Lichen  | 33  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Arctostaphylos glandulosa* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 76.0         | 75–77         | –          |
| Herb             | 1.1          | 0–2           | <0.5–0.5   |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Shrub</b>                         | 76.0         | 75–77         | 2–5        |
| <b>Regenerating/understory tree*</b> | 2.6          | 0.2–5         | <0.5–5     |
| <b>Hardwood</b>                      | 0.5          | 0–1           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (1)

**Macrotopography:** middle to upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (2)

**Parent material:** Franciscan melange (1), greenstone (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6–25° (2)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 1688 ft. | 1501–1874 ft. |
| <b>Slope</b>             | 16.0°    | 12–20°        |
| <b>Large rock cover</b>  | 2.5%     | 0–5%          |
| <b>Small rock cover</b>  | 3.1%     | 2–4%          |
| <b>Bare ground cover</b> | 30.5%    | 1–60%         |
| <b>Litter cover</b>      | 60.5%    | 35–86%        |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0147, SONO0596

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Arctostaphylos glandulosa* Association**

n = 2

| Lifeform                               | Code   | Botanical Name   | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                      | 50  | 1.0  | 1.0  | 1.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                             | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | ARME   | * <i>Arbutus menziesii</i>                             | 100 | 0.6  | 0.2  | 1.0  |
|  | QUPAS2 | <i>Quercus parvula</i> var. <i>shrevei</i>             | 50  | 5.0  | 5.0  | 5.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                      | 50  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                       | 100 | 56.5 | 45.0 | 68.0 |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                         | 100 | 0.6  | 0.2  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                         | 100 | 0.6  | 0.2  | 1.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>    | 100 | 0.2  | 0.2  | 0.2  |
|  | ARSTR  | <i>Arctostaphylos stanfordiana</i> ssp. <i>raichei</i> | 50  | 30.0 | 30.0 | 30.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Arctostaphylos glandulosa* Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Shrub</b>        |             |  |            |            |            |            |
|                     | FRCA12      | <i>Frangula californica</i>                      | 50         | 2.0        | 2.0        | 2.0        |
|                     | CEFO        | <i>Ceanothus foliosus</i>                        | 50         | 1.0        | 1.0        | 1.0        |
|                     | CECU        | <i>Ceanothus cuneatus</i>                        | 50         | 1.0        | 1.0        | 1.0        |
|                     | ERAR27      | <i>Ericameria arborescens</i>                    | 50         | 1.0        | 1.0        | 1.0        |
|                     | ERCA6       | <i>Eriodictyon californicum</i>                  | 50         | 1.0        | 1.0        | 1.0        |
|                     | CEGLE       | <i>Ceanothus gloriosus</i> var. <i>exaltatus</i> | 50         | 0.2        | 0.2        | 0.2        |
|                     | PIMOM       | <i>Pickeringia montana</i> var. <i>montana</i>   | 50         | 0.2        | 0.2        | 0.2        |
|                     | TODI        | <i>Toxicodendron diversilobum</i>                | 50         | 0.2        | 0.2        | 0.2        |
|                     | BAPI        | <i>Baccharis pilularis</i>                       | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 100        | 2.5        | 2.0        | 3.0        |

## ***Arctostaphylos viscida* Alliance**

### **Whiteleaf manzanita chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Arctostaphylos viscida* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Amelanchier alnifolia*, *Arctostaphylos manzanita*, *Arctostaphylos mewukka*, *Arctostaphylos myrtifolia*, *Arctostaphylos patula*, *Ceanothus cordulatus*, *Ceanothus cuneatus*, *Ceanothus integerrimus*, *Ceanothus velutinus*, *Garrya fremontii*, *Holodiscus discolor*, and *Quercus berberidifolia*. Emergent trees may be present at low cover, including *Pinus attenuata*, *Pinus ponderosa*, *Pinus sabiniana*, or *Pseudotsuga menziesii*.

In the many portions of its range, stands of *Arctostaphylos viscida* are transitional to montane forest or woodland types. Some stands persist for over 100 years. *Arctostaphylos viscida* grows under a wide range of conditions as a result of the species' high ecological plasticity. Three subspecies are recognized in the *Jepson Manual* (ssp. *mariposa*, ssp. *pulchella*, and ssp. *viscida*), and hybrids with *A. canescens* and *A. patula* are known. *Arctostaphylos viscida* ssp. *mariposa* grows in the central and southern Sierra Nevada; *A. viscida* ssp. *pulchella* grows in the Klamath Mountains and North Coast Ranges; and *A. viscida* ssp. *viscida* grows in the Cascades, Klamath Mountains, and Sierra Nevada. *Arctostaphylos viscida* ssp. *pulchella* regularly forms stands on serpentine substrates in Colusa, Glenn, Mendocino, Napa, and Tehama Counties. Alexander et al. (2007) recognized *Arctostaphylos viscida* ssp. *pulchella* as a separate alliance endemic to serpentine. However, sampling has been minimal in the range of the species and all forms of *A. viscida* are included in this alliance at this time.

### Sonoma County

In keeping with other observations for the North Coast Ranges (Alexander et al. 2007), stands of the *Arctostaphylos viscida* Alliance in Sonoma County appear to be restricted to xeric serpentine sites. When found in association with North Coast Range endemic manzanita species, such as *Arctostaphylos bakeri* or *A. stanfordiana*, it appears in the more xeric exposures.

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### **Local Alliance Summary (n = 7)**

**Elevation:** 521–3108 ft, mean 1557 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

#### **Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

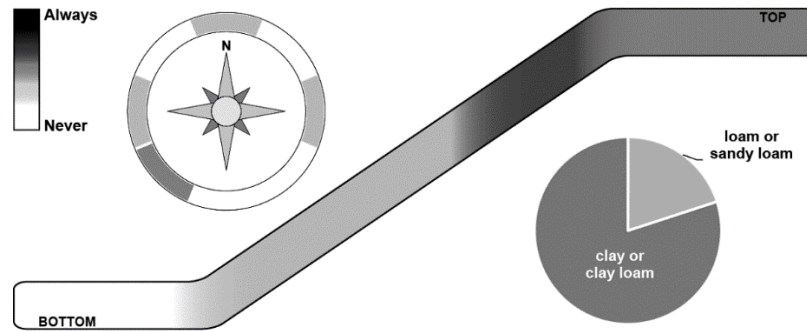
NatureServe global/state rank: G2T2/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 34.7         | 7–54          | –          |
| <b>Herb</b>                          | 3.2          | 0–15          | <0.5–0.5   |
| <b>Shrub</b>                         | 32.4         | 5–50          | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 0.2          | 0–1           | 1–2        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.8          | 0–3           | 1–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 22.6° | 18–33° |
| <b>Large rock cover</b>  | 12.3% | 6–28%  |
| <b>Small rock cover</b>  | 43.1% | 10–71% |
| <b>Bare ground cover</b> | 22.6% | 6–78%  |
| <b>Litter cover</b>      | 20.4% | 5–55%  |

**Associations within this Alliance:**

*Arctostaphylos viscida* – *Ceanothus jepsonii* Provisional Association

**STAND TABLE**

***Arctostaphylos viscida* Alliance**

n = 7

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | PSME   | <i>Pseudotsuga menziesii</i>                          | 29  | 0.6  | 0.2 | 1.0  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | CEJE   | <i>Ceanothus jepsonii</i>                             | 86  | 7.5  | 1.0 | 25.0 |
|  | ARVIP2 | * <i>Arctostaphylos viscida</i> ssp. <i>pulchella</i> | 57  | 19.3 | 5.0 | 40.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                        | 57  | 1.1  | 0.2 | 3.0  |
|  | ARVI4  | * <i>Arctostaphylos viscida</i>                       | 43  | 15.3 | 2.0 | 34.0 |
|  | QUDU4  | <i>Quercus durata</i>                                 | 43  | 2.3  | 1.0 | 5.0  |
|  | FRCA12 | * <i>Frangula californica</i>                         | 29  | 0.2  | 0.2 | 0.2  |
|  | FRCAT2 | * <i>Frangula californica</i> ssp. <i>tomentella</i>  | 29  | 0.2  | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.



**STAND TABLE** continued

***Arctostaphylos viscida* Alliance**

n = 7

| Lifeform     | Code  | Botanical Name             | Con | Avg | Min | Max |
|--------------|-------|----------------------------|-----|-----|-----|-----|
| Herb         |       |                            |     |     |     |     |
|              | ELEL5 | <i>Elymus elymoides</i>    | 43  | 0.5 | 0.2 | 1.0 |
|              | METO  | <i>Melica torreyana</i>    | 29  | 3.1 | 0.2 | 6.0 |
|              | VUMI  | <i>Vulpia microstachys</i> | 29  | 0.6 | 0.2 | 1.0 |
|              | SIBE  | <i>Sisyrinchium bellum</i> | 29  | 0.2 | 0.2 | 0.2 |
|              | ZIFR  | <i>Zigadenus fremontii</i> | 29  | 0.2 | 0.2 | 0.2 |
| Non-vascular |       |                            |     |     |     |     |
|              | 2MOSS | Moss                       | 57  | 0.6 | 0.2 | 1.0 |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

***Arctostaphylos viscida* – *Ceanothus jepsonii* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) and Coastal Franciscan/263Ag (5) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 34.7         | 7–54          | –          |
| Herb                          | 3.2          | 0–15          | <0.5–0.5   |
| Shrub                         | 32.4         | 5–50          | 0.5–5      |
| Regenerating/understory tree* | 0.2          | 0–1           | 1–2        |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.8          | 0–3           | 1–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), SW (5)

**Macrotopography:** lower to middle 1/3 of slope (1), lower to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (2)

**Microtopography:** convex (4), flat (2), undulating (1)

**Parent material:** metasedimentary (1), serpentine (4), ultramafic (2)

**Soil texture:** clay or clay loam (4), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (5), steep/>25° (1)

|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1557 ft. | 521–3108 ft. |
| Slope             | 22.6°    | 18–33°       |
| Large rock cover  | 12.3%    | 6–28%        |
| Small rock cover  | 43.1%    | 10–71%       |
| Bare ground cover | 22.6%    | 6–78%        |
| Litter cover      | 20.4%    | 5–55%        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** SONO0129, SONO0194, SONO0261, SONO0273, SONO0304, SONO0306, SONO2216

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Arctostaphylos viscida* – *Ceanothus jepsonii* Provisional Association**

n = 7

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | PSME   | <i>Pseudotsuga menziesii</i>                          | 29  | 0.6  | 0.2 | 1.0  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | CEJE   | <i>Ceanothus jepsonii</i>                             | 86  | 7.5  | 1.0 | 25.0 |
|  | ARVIP2 | * <i>Arctostaphylos viscida</i> ssp. <i>pulchella</i> | 57  | 19.3 | 5.0 | 40.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                        | 57  | 1.1  | 0.2 | 3.0  |
|  | ARVI4  | * <i>Arctostaphylos viscida</i>                       | 43  | 15.3 | 2.0 | 34.0 |
|  | QUDU4  | <i>Quercus durata</i>                                 | 43  | 2.3  | 1.0 | 5.0  |
|  | FRCA12 | * <i>Frangula californica</i>                         | 29  | 0.2  | 0.2 | 0.2  |
|  | FRCAT2 | * <i>Frangula californica</i> ssp. <i>tomentella</i>  | 29  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | ELEL5  | <i>Elymus elymoides</i>                               | 43  | 0.5  | 0.2 | 1.0  |
|  | METO   | <i>Melica torreyana</i>                               | 29  | 3.1  | 0.2 | 6.0  |
|  | VUMI   | <i>Vulpia microstachys</i>                            | 29  | 0.6  | 0.2 | 1.0  |
|  | ZIFR   | <i>Zigadenus fremontii</i>                            | 29  | 0.2  | 0.2 | 0.2  |
|  | SIBE   | <i>Sisyrinchium bellum</i>                            | 29  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |     |      |
|  | 2MOSS  | Moss  | 57  | 0.6  | 0.2 | 1.0  |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Baccharis pilularis* Alliance**  
**Coyote brush scrub**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Baccharis pilularis* is dominant or co-dominant in the shrub canopy with *Artemisia californica*, *Ceanothus thyrsiflorus*, *Corylus cornuta*, *Diplacus aurantiacus*, *Eriogonum fasciculatum*, *Eriophyllum staechadifolium*, *Frangula californica*, *Garrya elliptica*, *Gaultheria shallon*, *Holodiscus discolor*, *Lotus scoparius*, *Lupinus arboreus*, *Morella californica*, *Rubus ursinus*, *Salvia apiana*, *Salvia leucophylla*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Pinus muricata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, or *Umbellularia californica*.

Stands can be transitory to forest and woodland types or persistent for a long time (Heady et al. 1977). Seedlings of *Baccharis pilularis* invade grasslands in the central coast, forming stands when grazing and fire decrease (McBride and Heady 1968). Older, shady stands are transitional to forest types with *Pinus muricata*, *Pseudotsuga menziesii*, *Quercus agrifolia*, and *Umbellularia californica* (Grams et al. 1977, McBride 1974). *Baccharis pilularis* invades recently logged land in northern California well away from the coast. *B. pilularis* also invades coastal dunes stabilized by *Ammophila arenaria* or *Lupinus arboreus* (Pickart and Sawyer 1998).

*Baccharis pilularis* stands in the Sierra Nevada foothills, along the central coast, and in southern California tend to be largely seral to other scrub and woodland types. However, the natural seral relationships between *Baccharis pilularis* and adjacent herbaceous and woody alliances are complex and varied. The core of diverse, older stands of *Baccharis pilularis* lies along the coast from Monterey County to Sonoma County. For example, Borchert et al. (2004) identify a *Baccharis pilularis* Alliance in the northern Santa Lucia Range, where they sampled mid- to late-seral stands (with >25 years since fire).

Sonoma County

The *Baccharis pilularis* Alliance has several associations in Sonoma County. Mixed shrub stands in the vicinity of the coast are floristically and structurally diverse. These stands persist for relatively long periods of time, especially on headlands and coastal bluffs, and include the *Baccharis pilularis* – *Frangula californica* – *Rubus* spp. Provisional Association and the *Baccharis pilularis* – *Toxicodendron diversilobum* Association. Coastal stands with a native grass understory (*Baccharis pilularis* / *Danthonia californica* Association, *Baccharis pilularis* / *Deschampsia cespitosa* Association, *Baccharis pilularis* / *Nassella pulchra* Association, and *Baccharis pilularis* / Native Grass (Mixed) Association) are common along coastal bluffs and represent woody succession on former native coastal prairie sites. In contrast, the typical inland stands are seral to woodland or forest types, or represent direct succession to woody vegetation from cleared woodland or grassland removed from long-term grazing. Virtually all inland stands sampled in the county may be assigned to the *Baccharis pilularis* / Annual Grass – Herb Association.

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**Local Alliance Summary (n = 30)**

**Elevation:** 5–1612 ft, mean 662 ft

**SCV Global/State Rank:** G5/S5<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Noteworthy Taxa**

*Arctostaphylos stanfordiana* ssp. *decumbens*

CA rare plant rank: 1B.1

NatureServe global/state rank: G3T1/S1

*Ceanothus confusus*

CA rare plant rank: 1B.1

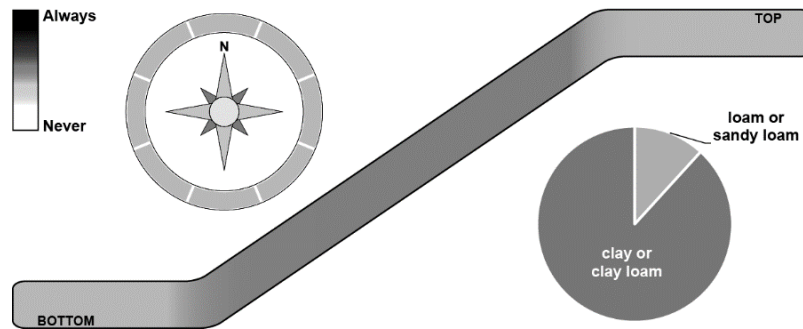
NatureServe global/state rank: G1/S1

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.7         | 32–98         | –          |
| <b>Herb</b>                          | 27.7         | 1–80          | <0.5–5     |
| <b>Shrub</b>                         | 40.3         | 5–90          | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.8          | 0–15          | <0.5–10    |
| <b>Hardwood</b>                      | 0.3          | 0–7           | 2–10       |
| <b>Conifer</b>                       | 0.2          | 0–2           | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 10.1° | 0–30° |
| <b>Large rock cover</b>  | 0.9%  | 0–10% |
| <b>Small rock cover</b>  | 5.0%  | 0–20% |
| <b>Bare ground cover</b> | 32.2% | 1–85% |
| <b>Litter cover</b>      | 57.4% | 5–93% |

**Associations within this Alliance:**

*Baccharis pilularis* – *Frangula californica* – *Rubus* spp. Provisional Association

*Baccharis pilularis* – *Toxicodendron diversilobum* Association

*Baccharis pilularis* / Annual Grass – Herb Association

*Baccharis pilularis* / *Danthonia californica* Association

*Baccharis pilularis* / *Deschampsia cespitosa* Association

*Baccharis pilularis* / *Nassella pulchra* Association

*Baccharis pilularis* / Native Grass (Mixed) Association

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Baccharis pilularis* Alliance**

n = 30

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|--------|---|-----|------|-----|------|
| <b>Tree</b>                            |        |   |     |      |     |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 23  | 1.1  | 0.2 | 3.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |     |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                      | 30  | 0.7  | 0.2 | 3.0  |
|  | QUAG   | <i>Quercus agrifolia</i>                            | 20  | 0.4  | 0.2 | 1.2  |
| <b>Shrub</b>                           |        |   |     |      |     |      |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 97  | 32.1 | 2.0 | 88.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 47  | 3.3  | 0.2 | 18.0 |
|  | RUUR   | <i>Rubus ursinus</i>                                | 40  | 7.2  | 0.2 | 25.0 |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 27  | 4.0  | 0.2 | 10.0 |
|  | FRCA12 | <i>Frangula californica</i>                         | 20  | 9.9  | 0.2 | 21.0 |
| <b>Herb</b>                            |        |   |     |      |     |      |
|  | ELGL   | <i>Elymus glaucus</i>                               | 47  | 1.9  | 0.2 | 10.0 |
|  | BRMA   | <i>Briza maxima</i>                                 | 33  | 10.5 | 3.0 | 38.0 |
|  | HOLA   | <i>Holcus lanatus</i>                               | 33  | 7.0  | 0.2 | 45.0 |
|  | CYEC   | <i>Cynosurus echinatus</i>                          | 30  | 7.0  | 0.2 | 20.0 |
|  | BRHO2  | <i>Bromus hordeaceus</i>                            | 30  | 4.8  | 0.2 | 20.0 |
|  | HYRA3  | <i>Hypochaeris radicata</i>                         | 30  | 3.0  | 0.2 | 18.0 |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 27  | 3.4  | 0.2 | 15.0 |
|  | VUBR   | <i>Vulpia bromoides</i>                             | 23  | 4.9  | 0.2 | 20.0 |
|  | NAPU4  | <i>Nassella pulchra</i>                             | 23  | 3.5  | 0.2 | 17.0 |
|  | LIBI5  | <i>Linum bienne</i>                                 | 20  | 1.3  | 0.2 | 3.0  |
|  | VISA   | <i>Vicia sativa</i>                                 | 20  | 0.2  | 0.2 | 0.4  |
| <b>Non-vascular</b>                    |        |   |     |      |     |      |
|  | 2LICHN | Lichen  | 23  | 2.5  | 0.2 | 10.0 |

**Noteworthy Taxa**

*Arctostaphylos stanfordiana* ssp. *decumbens*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G3T1/S1

*Ceanothus confusus*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G1/S1

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Baccharis pilularis* – *Frangula californica* – *Rubus* spp. Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (5) USDA Ecological Subsection (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 85.4         | 62–98         | –          |
| <b>Herb</b>                          | 20.0         | 2–68          | 0.5–2      |
| <b>Shrub</b>                         | 68.6         | 35–85         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.3          | 0–1           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | 2–5        |
| <b>Conifer</b>                       | 0.1          | 0–0.2         | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), SE (1), variable (2)

**Macrotopography:** lower to middle 1/3 of slope (2), lower to upper 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (1), convex (3), undulating (1)

**Parent material:** Franciscan melange (4), granitic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (3), steep/>25° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 576 ft. | 243–788 ft. |
| <b>Slope</b>             | 12.3°   | 5–18°       |
| <b>Large rock cover</b>  | 0.0%    | 0%          |
| <b>Small rock cover</b>  | 0.0%    | 0%          |
| <b>Bare ground cover</b> | 2.0%    | 2%          |
| <b>Litter cover</b>      | 93.0%   | 93%         |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0091, SONO0093, SONO0108, SONO0161, SONO0603

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Baccharis pilularis* – *Frangula californica* – *Rubus* spp. Provisional Association**

n = 5

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|--------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            | PSME   | * <i>Pseudotsuga menziesii</i>    | 60  | 0.5  | 0.2  | 1.0  |
|  | UMCA   | * <i>Umbellularia californica</i> | 20  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> | PSME   | * <i>Pseudotsuga menziesii</i>    | 60  | 0.5  | 0.2  | 1.0  |
|  | UMCA   | * <i>Umbellularia californica</i> | 40  | 0.6  | 0.2  | 1.0  |
| <b>Shrub</b>                           | BAPI   | <i>Baccharis pilularis</i>        | 100 | 38.6 | 18.0 | 60.0 |
|  | FRCA12 | <i>Frangula californica</i>       | 100 | 11.8 | 0.2  | 21.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Baccharis pilularis* – *Frangula californica* – *Rubus* spp. Provisional Association**

n = 5

| Lifeform            | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Shrub</b>        |        |   |     |      |      |      |
|                     | RUUR   | <i>Rubus ursinus</i>                                | 100 | 11.0 | 5.0  | 25.0 |
|                     | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 80  | 6.8  | 2.0  | 10.0 |
|                     | TODI   | <i>Toxicodendron diversilobum</i>                   | 80  | 4.8  | 2.0  | 6.0  |
|                     | HODI   | <i>Holodiscus discolor</i>                          | 40  | 1.1  | 0.2  | 2.0  |
|                     | COCOC  | <i>Corylus cornuta</i> var. <i>californica</i>      | 20  | 10.0 | 10.0 | 10.0 |
|                     | LONIC  | <i>Lonicera</i>                                     | 20  | 2.0  | 2.0  | 2.0  |
|                     | LOHI2  | <i>Lonicera hispidula</i>                           | 20  | 1.0  | 1.0  | 1.0  |
|                     | LOINL  | <i>Lonicera involucrata</i> var. <i>ledebourii</i>  | 20  | 1.0  | 1.0  | 1.0  |
|                     | MAPIP2 | <i>Mahonia pinnata</i> ssp. <i>pinnata</i>          | 20  | 1.0  | 1.0  | 1.0  |
|                     | RUPA   | <i>Rubus parviflorus</i>                            | 20  | 1.0  | 1.0  | 1.0  |
|                     | SYAL   | <i>Symphoricarpos albus</i>                         | 20  | 1.0  | 1.0  | 1.0  |
|                     | VAOV2  | <i>Vaccinium ovatum</i>                             | 20  | 1.0  | 1.0  | 1.0  |
|                     | SARAR3 | <i>Sambucus racemosa</i> var. <i>racemosa</i>       | 20  | 0.2  | 0.2  | 0.2  |
|                     | CEANO  | <i>Ceanothus</i>                                    | 20  | 0.2  | 0.2  | 0.2  |
|                     | RIBES  | <i>Ribes</i>  | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 60  | 2.0  | 1.0  | 4.0  |
|                     | HEMA80 | <i>Heracleum maximum</i>                            | 60  | 1.1  | 0.2  | 2.0  |
|                     | HOLA   | <i>Holcus lanatus</i>                               | 40  | 22.6 | 0.2  | 45.0 |
|                     | POMU   | <i>Polystichum munitum</i>                          | 40  | 1.5  | 1.0  | 2.0  |
|                     | ANMA   | <i>Anaphalis margaritacea</i>                       | 40  | 0.6  | 0.2  | 1.0  |
|                     | 2DAPI  | <i>Danthonia pilosa</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|                     | FEID   | <i>Festuca idahoensis</i>                           | 20  | 23.0 | 23.0 | 23.0 |
|                     | IRDO   | <i>Iris douglasiana</i>                             | 20  | 5.0  | 5.0  | 5.0  |
|                     | URTIC  | <i>Urtica</i>                                       | 20  | 4.0  | 4.0  | 4.0  |
|                     | ELGL   | <i>Elymus glaucus</i>                               | 20  | 0.2  | 0.2  | 0.2  |
|                     | WOFI   | <i>Woodwardia fimbriata</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|                     | STACH  | <i>Stachys</i>                                      | 20  | 0.2  | 0.2  | 0.2  |
|                     | POGLG4 | <i>Potentilla glandulosa</i> ssp. <i>glandulosa</i> | 20  | 0.2  | 0.2  | 0.2  |
|                     | MASA   | <i>Madia sativa</i>                                 | 20  | 0.2  | 0.2  | 0.2  |
|                     | JUPA2  | <i>Juncus patens</i>                                | 20  | 0.2  | 0.2  | 0.2  |
|                     | CIVU   | <i>Cirsium vulgare</i>                              | 20  | 0.2  | 0.2  | 0.2  |
|                     | CATU3  | <i>Carex tumulicola</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|                     | BRCA5  | <i>Bromus carinatus</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|                     | AVBA   | <i>Avena barbata</i>                                | 20  | 0.2  | 0.2  | 0.2  |
|                     | ARDO3  | <i>Artemisia douglasiana</i>                        | 20  | 0.2  | 0.2  | 0.2  |
|                     | KOMA   | <i>Koeleria macrantha</i>                           | 20  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2LICHN | Lichen  | 40  | 2.0  | 2.0  | 2.0  |

***Baccharis pilularis* – *Toxicodendron diversilobum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsection (Miles and Goudey 1997).

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 80.0         | 80–80         | –          |
| <b>Herb</b>                          | 8.0          | 7–9           | 1–5        |
| <b>Shrub</b>                         | 74.0         | 70–78         | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.1          | 0–0.2         | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), variable (1)

**Macrotopography:** lower 1/3 of slope (1), lower to upper 1/3 of slope (1)

**Microtopography:** convex (1), undulating (1)

**Parent material:** Franciscan melange (2)

**Soil texture:** no data

**Slope steepness:** moderate/6-25° (2)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 475 ft. | 235–715 ft. |
| <b>Slope</b>             | 12.0°   | 10–14°      |
| <b>Large rock cover</b>  | 0.6%    | 0.6%        |
| <b>Small rock cover</b>  | 0.4%    | 0.4%        |
| <b>Bare ground cover</b> | 1.0%    | 1%          |
| <b>Litter cover</b>      | 93.0%   | 93%         |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0061, SONO0602

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Baccharis pilularis* – *Toxicodendron diversilobum* Association**

n = 2

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            |       |   |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                      | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | BAPI  | <i>Baccharis pilularis</i>                          | 100 | 70.0 | 65.0 | 75.0 |
|  | RUUR  | <i>Rubus ursinus</i>                                | 100 | 10.0 | 5.0  | 15.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 100 | 2.0  | 1.0  | 3.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 50  | 3.0  | 3.0  | 3.0  |
|  | LOINL | <i>Lonicera involucrata</i> var. <i>ledebourii</i>  | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**STAND TABLE** continued

***Baccharis pilularis* – *Toxicodendron diversilobum* Association**

n = 2

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| Herb         |        |  |     |      |      |      |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 2.0  | 1.0  | 3.0  |
|              | HOLA   | <i>Holcus lanatus</i>                            | 100 | 1.6  | 0.2  | 3.0  |
|              | POMU   | <i>Polystichum munitum</i>                       | 100 | 0.6  | 0.2  | 1.0  |
|              | IRDO   | <i>Iris douglasiana</i>                          | 100 | 0.6  | 0.2  | 1.0  |
|              | COMA2  | <i>Conium maculatum</i>                          | 50  | 4.0  | 4.0  | 4.0  |
|              | ELGL   | <i>Elymus glaucus</i>                            | 50  | 1.0  | 1.0  | 1.0  |
|              | HYRA3  | <i>Hypochaeris radicata</i>                      | 50  | 1.0  | 1.0  | 1.0  |
|              | PLLA   | <i>Plantago lanceolata</i>                       | 50  | 1.0  | 1.0  | 1.0  |
|              | SCCA2  | <i>Scrophularia californica</i>                  | 50  | 1.0  | 1.0  | 1.0  |
|              | ATFI   | <i>Athyrium filix-femina</i>                     | 50  | 0.2  | 0.2  | 0.2  |
|              | STBU   | <i>Stachys bullata</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|              | RUAC3  | <i>Rumex acetosella</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|              | PLANT  | <i>Plantago</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|              | GEDI   | <i>Geranium dissectum</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|              | PETR7  | <i>Pentagramma triangularis</i>                  | 50  | 0.2  | 0.2  | 0.2  |
| Non-vascular |        |  |     |      |      |      |
|              | 2LICHN | Lichen   | 100 | 1.6  | 0.2  | 3.0  |
|              | 2MOSS  | Moss   | 50  | 20.0 | 20.0 | 20.0 |

***Baccharis pilularis* / Annual Grass – Herb Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (5), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (5) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 52.2         | 32–80         | –          |
| <b>Herb</b>                          | 31.8         | 12–60         | <0.5–1     |
| <b>Shrub</b>                         | 29.3         | 10–50         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.4          | 0–2           | 2–5        |
| <b>Hardwood</b>                      | 0.1          | 0–1           | 2–10       |
| <b>Conifer</b>                       | 0.2          | 0–2           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (3), NE (1), NW (2), SE (1), SW (3), variable (2)

**Macrotopography:** bottom (1), bottom to lower 1/3 of slope (1), lower 1/3 of slope (2), lower to middle 1/3 of slope (1), lower to upper 1/3 of slope (1), middle 1/3 of slope (1), middle to upper 1/3 of slope (2), upper 1/3 of slope (3)

**Microtopography:** convex (5), flat (4), undulating (3)

**Parent material:** Franciscan melange (2), rhyolite (1), sandstone (2), sedimentary (3), serpentine (2), volcanic (2)

**Soil texture:** clay or clay loam (6), loam or sandy loam (2)

**Slope steepness:** flat/0° (3), gentle/1-5° (1), moderate/6-25° (7), steep/>25° (1)

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|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 644 ft. | 5–1300 ft. |
| Slope             | 11.3°   | 0–30°      |
| Large rock cover  | 1.2%    | 0–10%      |
| Small rock cover  | 5.4%    | 0–20%      |
| Bare ground cover | 37.6%   | 5–85%      |
| Litter cover      | 53.8%   | 5–93%      |

**Samples Used to Describe Association (n=12)**

**Rapid Assessments:** MILOB111, SONO0074, SONO0149, SONO0277, SONO0322, SONO0328, SONO0377, SONO0379, SONO0385, SONO0589, SONO2211

**Relevés:** MILOB110

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Baccharis pilularis* / Annual Grass – Herb Association**

n = 12

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|--------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |        |                                   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>        | 25  | 0.5  | 0.2  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>        | 25  | 0.5  | 0.2  | 1.2  |
| <b>Shrub</b>                           |        |                                   |     |      |      |      |
|  | BAPI   | <i>Baccharis pilularis</i>        | 92  | 27.7 | 10.0 | 45.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i> | 42  | 0.9  | 0.2  | 3.0  |
| <b>Herb</b>                            |        |                                   |     |      |      |      |
|  | CYEC   | <i>Cynosurus echinatus</i>        | 58  | 8.9  | 1.0  | 20.0 |
|  | ELGL   | <i>Elymus glaucus</i>             | 58  | 0.9  | 0.2  | 2.0  |
|  | BRMA   | <i>Briza maxima</i>               | 50  | 8.7  | 3.0  | 20.0 |
|  | BRHO2  | <i>Bromus hordeaceus</i>          | 50  | 7.2  | 1.0  | 20.0 |
|  | VUBR   | <i>Vulpia bromoides</i>           | 50  | 5.2  | 0.2  | 20.0 |
|  | HYRA3  | <i>Hypochaeris radicata</i>       | 42  | 1.0  | 0.2  | 2.0  |
|  | NAPU4  | <i>Nassella pulchra</i>           | 42  | 0.9  | 0.2  | 3.0  |
|  | TACA8  | <i>Taeniatherum caput-medusae</i> | 33  | 16.1 | 0.2  | 34.0 |
|  | LOPE   | <i>Lolium perenne</i>             | 33  | 4.4  | 0.2  | 10.0 |
|  | BRDI3  | <i>Bromus diandrus</i>            | 33  | 2.1  | 0.2  | 5.0  |
|  | AVBA   | <i>Avena barbata</i>              | 25  | 5.7  | 3.0  | 10.0 |
|  | HOLA   | <i>Holcus lanatus</i>             | 25  | 1.8  | 0.2  | 5.0  |
|  | LIBI5  | <i>Linum bienne</i>               | 25  | 1.4  | 0.2  | 2.0  |
|  | CAPY2  | <i>Carduus pycnocephalus</i>      | 25  | 1.1  | 0.2  | 2.0  |
| <b>Non-vascular</b>                    |        |                                   |     |      |      |      |
|  | 2LICHN | Lichen                            | 25  | 3.5  | 0.2  | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Baccharis pilularis* / *Danthonia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Herb                          | 75.0         | 75            | –          |
| Shrub                         | 10.0         | 10            | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** no data (1)

**Macrotopography:** lower 1/3 of slope (1)

**Microtopography:** flat (1)

**Parent material:** sedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (1)

|                   | Mean   | Range  |
|-------------------|--------|--------|
| Elevation         | 98 ft. | 98 ft. |
| Slope             | 0.0°   | 0°     |
| Large rock cover  | 0.0%   | 0%     |
| Small rock cover  | 1.0%   | 1%     |
| Bare ground cover | 2.0%   | 2%     |
| Litter cover      | 87.0%  | 87%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** HEAD0211

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Baccharis pilularis* / *Danthonia californica* Association**

n = 1

| Lifeform | Code  | Botanical Name              | Con | Avg  | Min  | Max  |
|----------|-------|-----------------------------|-----|------|------|------|
| Shrub    | BAPI  | <i>Baccharis pilularis</i>  | 100 | 18.0 | 18.0 | 18.0 |
|          | RUUR  | <i>Rubus ursinus</i>        | 100 | 3.0  | 3.0  | 3.0  |
| Herb     | BRMA  | <i>Briza maxima</i>         | 100 | 38.0 | 38.0 | 38.0 |
|          | HOLA  | <i>Holcus lanatus</i>       | 100 | 8.0  | 8.0  | 8.0  |
|          | HYRA3 | <i>Hypochaeris radicata</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | VUBR  | <i>Vulpia bromoides</i>     | 100 | 3.0  | 3.0  | 3.0  |
|          | LOHU2 | <i>Lotus humistratus</i>    | 100 | 3.0  | 3.0  | 3.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Baccharis pilularis* / *Danthonia californica* Association**

n = 1

| Lifeform | Code  | Botanical Name                                       | Con | Avg | Min | Max |
|----------|-------|--|-----|-----|-----|-----|
| Herb     | GEDI  | <i>Geranium dissectum</i>                            | 100 | 3.0 | 3.0 | 3.0 |
|          | FRCH  | <i>Fragaria chiloensis</i>                           | 100 | 3.0 | 3.0 | 3.0 |
|          | DACA3 | <i>Danthonia californica</i>                         | 100 | 3.0 | 3.0 | 3.0 |
|          | CAGY3 | <i>Carex gynodynamis</i>                             | 100 | 3.0 | 3.0 | 3.0 |
|          | PLLA  | <i>Plantago lanceolata</i>                           | 100 | 3.0 | 3.0 | 3.0 |
|          | AICA  | <i>Aira caryophyllea</i>                             | 100 | 0.2 | 0.2 | 0.2 |
|          | JUPA2 | <i>Juncus patens</i>                                 | 100 | 0.2 | 0.2 | 0.2 |
|          | VISA  | <i>Vicia sativa</i>                                  | 100 | 0.2 | 0.2 | 0.2 |
|          | SOAS  | <i>Sonchus asper</i>                                 | 100 | 0.2 | 0.2 | 0.2 |
|          | SIBE  | <i>Sisyrinchium bellum</i>                           | 100 | 0.2 | 0.2 | 0.2 |
|          | LOUNU | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> | 100 | 0.2 | 0.2 | 0.2 |
|          | LOCO6 | <i>Lotus corniculatus</i>                            | 100 | 0.2 | 0.2 | 0.2 |
|          | LOPE  | <i>Lolium perenne</i>                                | 100 | 0.2 | 0.2 | 0.2 |
|          | LIBI5 | <i>Linum bienne</i>                                  | 100 | 0.2 | 0.2 | 0.2 |
|          | ELGL  | <i>Elymus glaucus</i>                                | 100 | 0.2 | 0.2 | 0.2 |
|          | DECE  | <i>Deschampsia cespitosa</i>                         | 100 | 0.2 | 0.2 | 0.2 |
|          | CIVU  | <i>Cirsium vulgare</i>                               | 100 | 0.2 | 0.2 | 0.2 |
|          | CATU3 | <i>Carex tumulicola</i>                              | 100 | 0.2 | 0.2 | 0.2 |
|          | BRHO2 | <i>Bromus hordeaceus</i>                             | 100 | 0.2 | 0.2 | 0.2 |
|          | BRMI2 | <i>Briza minor</i>                                   | 100 | 0.2 | 0.2 | 0.2 |
|          | ACMI2 | <i>Achillea millefolium</i>                          | 100 | 0.2 | 0.2 | 0.2 |
|          | BRCA5 | <i>Bromus carinatus</i>                              | 100 | 0.2 | 0.2 | 0.2 |

***Baccharis pilularis* / *Deschampsia cespitosa* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Herb                          | 80.0         | 80            | –          |
| Shrub                         | 5.0          | 5             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** no data (1)

**Macrotopography:** lower 1/3 of slope (1)

**Microtopography:** flat (1)

**Parent material:** sedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (1)

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|                   | Mean   | Range  |
|-------------------|--------|--------|
| Elevation         | 87 ft. | 87 ft. |
| Slope             | 0.0°   | 0°     |
| Large rock cover  | 0.0%   | 0%     |
| Small rock cover  | 0.0%   | 0%     |
| Bare ground cover | 20.0%  | 20%    |
| Litter cover      | 65.0%  | 65%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** HEAD0016

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Baccharis pilularis* / *Deschampsia cespitosa* Association**

n = 1

| Lifeform | Code               | Botanical Name               | Con | Avg  | Min  | Max  |
|----------|--------------------|------------------------------|-----|------|------|------|
| Shrub    | BAPI               | <i>Baccharis pilularis</i>   | 100 | 88.0 | 88.0 | 88.0 |
|          | RUUR               | <i>Rubus ursinus</i>         | 100 | 0.2  | 0.2  | 0.2  |
| Herb     | DECE               | <i>Deschampsia cespitosa</i> | 100 | 38.0 | 38.0 | 38.0 |
|          | BRCA5              | <i>Bromus carinatus</i>      | 100 | 8.0  | 8.0  | 8.0  |
|          | CAREX              | <i>Carex</i>                 | 100 | 8.0  | 8.0  | 8.0  |
|          | HOLA               | <i>Holcus lanatus</i>        | 100 | 8.0  | 8.0  | 8.0  |
|          | RUAC3              | <i>Rumex acetosella</i>      | 100 | 3.0  | 3.0  | 3.0  |
|          | BRMA               | <i>Briza maxima</i>          | 100 | 3.0  | 3.0  | 3.0  |
|          | CATU3              | <i>Carex tumulicola</i>      | 100 | 3.0  | 3.0  | 3.0  |
|          | DACA3              | <i>Danthonia californica</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | ERAR12             | <i>Eryngium armatum</i>      | 100 | 3.0  | 3.0  | 3.0  |
|          | PLLA               | <i>Plantago lanceolata</i>   | 100 | 3.0  | 3.0  | 3.0  |
|          | VISA               | <i>Vicia sativa</i>          | 100 | 0.4  | 0.4  | 0.4  |
|          | JUPA2              | <i>Juncus patens</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | PRVU               | <i>Prunella vulgaris</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | POTEN              | <i>Potentilla</i>            | 100 | 0.2  | 0.2  | 0.2  |
|          | CIVU               | <i>Cirsium vulgare</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | MYDI               | <i>Myosotis discolor</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | SYMPH4             | <i>Symphyotrichum</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | LUCO6              | <i>Luzula comosa</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | LUVE               | <i>Lupinus versicolor</i>    | 100 | 0.2  | 0.2  | 0.2  |
|          | LOCO6              | <i>Lotus corniculatus</i>    | 100 | 0.2  | 0.2  | 0.2  |
|          | RANUN              | <i>Ranunculus</i>            | 100 | 0.2  | 0.2  | 0.2  |
|          | JUNCU              | <i>Juncus</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | HYRA3              | <i>Hypochaeris radicata</i>  | 100 | 0.2  | 0.2  | 0.2  |
|          | GRIND              | <i>Grindelia</i>             | 100 | 0.2  | 0.2  | 0.2  |
|          | GEDI               | <i>Geranium dissectum</i>    | 100 | 0.2  | 0.2  | 0.2  |
|          | ELGL               | <i>Elymus glaucus</i>        | 100 | 0.2  | 0.2  | 0.2  |
| BRMI2    | <i>Briza minor</i> | 100                          | 0.2 | 0.2  | 0.2  |      |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Baccharis pilularis* / *Deschampsia cespitosa* Association**

n = 1

| Lifeform | Code  | Botanical Name              | Con | Avg | Min | Max |
|----------|-------|-----------------------------|-----|-----|-----|-----|
| Herb     |       |                             |     |     |     |     |
|          | ANHE  | <i>Angelica hendersonii</i> | 100 | 0.2 | 0.2 | 0.2 |
|          | ACMI2 | <i>Achillea millefolium</i> | 100 | 0.2 | 0.2 | 0.2 |
|          | SOAS  | <i>Sonchus asper</i>        | 100 | 0.2 | 0.2 | 0.2 |
|          | FRCH  | <i>Fragaria chiloensis</i>  | 100 | 0.2 | 0.2 | 0.2 |
|          | VICIA | <i>Vicia</i>                | 100 | 0.2 | 0.2 | 0.2 |
|          | WYETH | <i>Wyethia</i>              | 100 | 0.2 | 0.2 | 0.2 |
|          | SIBE  | <i>Sisyrinchium bellum</i>  | 100 | 0.2 | 0.2 | 0.2 |
|          | DUDLE | <i>Dudleya</i>              | 100 | 0.1 | 0.1 | 0.1 |
|          | GNAPH | <i>Gnaphalium</i>           | 100 | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Baccharis pilularis* / *Nassella pulchra* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 60            | –          |
| <b>Herb</b>                          | 30.0         | 30            | <0.5–0.5   |
| <b>Shrub</b>                         | 40.0         | 40            | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.2          | 0.2           | 2–5        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1)

**Macrotopography:** Middle to Upper 1/3 of slope (1)

**Microtopography:** undulating (1)

**Parent material:** Franciscan melange (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 763 ft. | 763 ft. |
| <b>Slope</b>             | 18.0°   | 18°     |
| <b>Large rock cover</b>  | 0.2%    | 0.2%    |
| <b>Small rock cover</b>  | 0.2%    | 0.2%    |
| <b>Bare ground cover</b> | 30.0%   | 30%     |
| <b>Litter cover</b>      | 55.0%   | 55%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** MILOB105

**Relevés:** none

SCV Global/State Rank: G3?/S3?<sup>1</sup>

**STAND TABLE**

***Baccharis pilularis* / *Nassella pulchra* Association**

n = 1

| Lifeform | Code                      | Botanical Name                              | Con | Avg  | Min  | Max  |
|----------|---------------------------|---|-----|------|------|------|
| Shrub    | BAPI                      | <i>Baccharis pilularis</i>                  | 100 | 40.2 | 40.2 | 40.2 |
|          | TODI                      | <i>Toxicodendron diversilobum</i>           | 100 | 0.2  | 0.2  | 0.2  |
| Herb     | NAPU4                     | <i>Nassella pulchra</i>                     | 100 | 17.0 | 17.0 | 17.0 |
|          | ELGL                      | <i>Elymus glaucus</i>                       | 100 | 10.0 | 10.0 | 10.0 |
|          | JUEFP                     | <i>Juncus effusus</i> var. <i>pacificus</i> | 100 | 2.0  | 2.0  | 2.0  |
|          | GEDI                      | <i>Geranium dissectum</i>                   | 100 | 1.0  | 1.0  | 1.0  |
|          | CAPY2                     | <i>Carduus pycnocephalus</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | CAREX                     | <i>Carex</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|          | CLDO2                     | <i>Clinopodium douglasii</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | CYEC                      | <i>Cynosurus echinatus</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|          | HYGL2                     | <i>Hypochaeris glabra</i>                   | 100 | 0.2  | 0.2  | 0.2  |
|          | LIBI5                     | <i>Linum bienne</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|          | VISA                      | <i>Vicia sativa</i>                         | 100 | 0.2  | 0.2  | 0.2  |
| ANAR     | <i>Anagallis arvensis</i> | 100   | 0.2 | 0.2  | 0.2  |      |

***Baccharis pilularis* / Native Grass (Mixed) Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 43.5         | 42–45 <sup>2</sup> | –          |
| <b>Herb</b>                          | 31.7         | 20–50              | 0.5–2      |
| <b>Shrub</b>                         | 28.3         | 25–30              | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.4          | 0–1                | <0.5–2     |
| <b>Hardwood</b>                      | 2.3          | 0–7                | 2–5        |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SW (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (2)

**Microtopography:** convex (1), flat (2)

**Parent material:** metasedimentary (1), volcanic (2)

**Soil texture:** clay or clay loam (3)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2)

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

<sup>2</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

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|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 789 ft. | 433–1090 ft. |
| Slope             | 10.0°   | 3–15°        |
| Large rock cover  | 0.7%    | 0–2%         |
| Small rock cover  | 0.4%    | 0–1%         |
| Bare ground cover | 27.3%   | 12–50%       |
| Litter cover      | 64.7%   | 35–85%       |

Samples Used to Describe Association (n=3)  
Rapid Assessments: SONO0382, SONO0388  
Relevés: HEAD0341

SCV Global/State Rank: G3?/S3?¹

**STAND TABLE**

***Baccharis pilularis* / Native Grass (Mixed) Association**

n = 3

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 33  | 7.0  | 7.0  | 7.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 67  | 0.2  | 0.2  | 0.2  |
|  | ARME  | <i>Arbutus menziesii</i>          | 67  | 0.2  | 0.2  | 0.2  |
|  | PSME  | <i>Pseudotsuga menziesii</i>      | 67  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | BAPI  | <i>Baccharis pilularis</i>        | 100 | 24.0 | 18.0 | 30.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 33  | 18.0 | 18.0 | 18.0 |
|  | RUUR  | <i>Rubus ursinus</i>              | 33  | 3.0  | 3.0  | 3.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>   | 33  | 1.0  | 1.0  | 1.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>         | 33  | 1.0  | 1.0  | 1.0  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | FECA  | <i>Festuca californica</i>        | 67  | 8.0  | 6.0  | 10.0 |
|  | ELGL  | <i>Elymus glaucus</i>             | 67  | 4.1  | 0.2  | 8.0  |
|  | PLLA  | <i>Plantago lanceolata</i>        | 33  | 68.0 | 68.0 | 68.0 |
|  | FEID  | <i>Festuca idahoensis</i>         | 33  | 38.0 | 38.0 | 38.0 |
|  | HYRA3 | <i>Hypochaeris radicata</i>       | 33  | 18.0 | 18.0 | 18.0 |
|  | AICA  | <i>Aira caryophyllea</i>          | 33  | 8.0  | 8.0  | 8.0  |
|  | IRDO  | <i>Iris douglasiana</i>           | 33  | 8.0  | 8.0  | 8.0  |
|  | CEME2 | <i>Centaurea melitensis</i>       | 33  | 5.0  | 5.0  | 5.0  |
|  | LIBI5 | <i>Linum bienne</i>               | 33  | 3.0  | 3.0  | 3.0  |
|  | SIBE  | <i>Sisyrinchium bellum</i>        | 33  | 3.0  | 3.0  | 3.0  |
|  | SABI3 | <i>Sanicula bipinnatifida</i>     | 33  | 3.0  | 3.0  | 3.0  |
|  | ANAR  | <i>Anagallis arvensis</i>         | 33  | 3.0  | 3.0  | 3.0  |
|  | NAPU4 | <i>Nassella pulchra</i>           | 33  | 3.0  | 3.0  | 3.0  |
|  | HYGL2 | <i>Hypochaeris glabra</i>         | 33  | 3.0  | 3.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**STAND TABLE** continued

***Baccharis pilularis* / Native Grass (Mixed) Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | CAGY3       | <i>Carex gynodynamis</i>                         | 33         | 3.0        | 3.0        | 3.0        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>                  | 33         | 3.0        | 3.0        | 3.0        |
|                 | LEYMU       | <i>Leymus</i>                                    | 33         | 3.0        | 3.0        | 3.0        |
|                 | CYNOS2      | <i>Cynosurus</i>                                 | 33         | 2.0        | 2.0        | 2.0        |
|                 | TOAR        | <i>Torilis arvensis</i>                          | 33         | 2.0        | 2.0        | 2.0        |
|                 | VUMI        | <i>Vulpia microstachys</i>                       | 33         | 2.0        | 2.0        | 2.0        |
|                 | KOMA        | <i>Koeleria macrantha</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|                 | VISA        | <i>Vicia sativa</i>                              | 33         | 0.2        | 0.2        | 0.2        |
|                 | TRLA16      | <i>Triteleia laxa</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | SYMPH4      | <i>Symphyotrichum</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | SOAS        | <i>Sonchus asper</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                 | SHAR2       | <i>Sherardia arvensis</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|                 | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33         | 0.2        | 0.2        | 0.2        |
|                 | LATHY       | <i>Lathyrus</i>                                  | 33         | 0.2        | 0.2        | 0.2        |
|                 | ANMA        | <i>Anaphalis margaritacea</i>                    | 33         | 0.2        | 0.2        | 0.2        |
|                 | DACA3       | <i>Danthonia californica</i>                     | 33         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRCA5       | <i>Bromus carinatus</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRDI2       | <i>Brachypodium distachyon</i>                   | 33         | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                 | DAPU3       | <i>Daucus pusillus</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                 | LOHU2       | <i>Lotus humistratus</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                 | WYAN        | <i>Wyethia angustifolia</i>                      | 33         | 0.1        | 0.1        | 0.1        |
|                 | LUVE        | <i>Lupinus versicolor</i>                        | 33         | 0.1        | 0.1        | 0.1        |

## ***Ceanothus cuneatus* Alliance**

**Wedge leaf ceanothus chaparral, Buck brush chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Ceanothus cuneatus* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos glauca*, *Arctostaphylos manzanita*, *Arctostaphylos patula*, *Arctostaphylos tomentosa*, *Ceanothus integerrimus*, *Cercocarpus montanus*, *Eriogonum fasciculatum*, *Garrya fremontii*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus john-tuckeri*, *Rhus ovata*, and *Salvia mellifera*. Emergent trees may be present at low cover, including *Calocedrus decurrens*, *Juniperus californica*, *Pinus jeffreyi*, *Pinus ponderosa*, *Pinus sabiniana*, *Quercus douglasii*, or *Quercus wislizeni*.

*Ceanothus cuneatus* occurs as an understory shrub in various forest and woodland types in northern California, and it is present as a secondary species in many chaparral alliances in southern California. Self-perpetuating stands are typically restricted to rocky, harsh exposures or substrates. Many stands establish after fire and they form an important part of the chaparral in northern and central California. *Ceanothus cuneatus* stands are often dense, with interlocking crowns that may contain abundant deadwood. *Ceanothus cuneatus* may also form open stands with much bare ground.

Mixed stands with co-dominant *Adenostoma fasciculatum* are common in the central coast and inner North Coast Ranges, and occur more sporadically in the Sierra Nevada and in southern California. These mixed stands occur on a variety of exposures along steep lower to upper slopes. Substrates are usually sedimentary and metamorphic. Because of ecological overlap between mixed and pure *Ceanothus cuneatus* stands, the former practice of segregating them into separate series or alliances has been discontinued. There are five varieties of *Ceanothus cuneatus* (Fross and Wilken 2006); *Ceanothus cuneatus* var. *cuneatus* and *C. cuneatus* var. *ramulosus* are included in this alliance.

### Sonoma County

Stands of *Ceanothus cuneatus* Alliance are widely scattered in the interior of the county, at least 25 km from the coast. A single widespread association (*Ceanothus cuneatus* – *Adenostoma fasciculatum*) is represented in all stands sampled. All *Ceanothus cuneatus* stands are associated with relatively large, mappable patches of chaparral, both on and off serpentine soils.

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### **Local Alliance Summary (n = 7)**

**Elevation:** 1514–2831 ft, mean 2032 ft

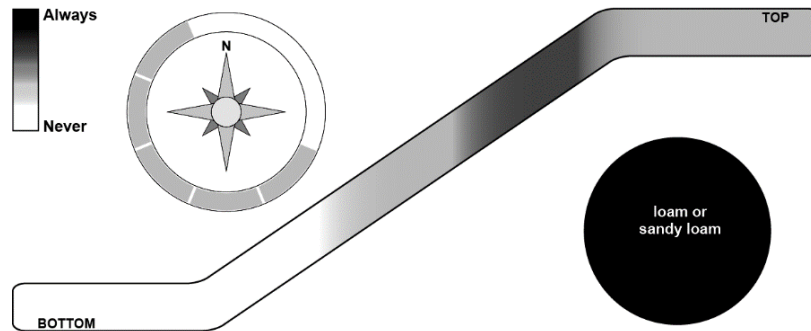
**SCV Global/State Rank:** G4/S4<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.0         | 60–80         | –          |
| <b>Herb</b>                          | 1.2          | 0–5           | <0.5–0.5   |
| <b>Shrub</b>                         | 68.1         | 60–75         | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.9          | 0–6           | 2–5        |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | –          |
| <b>Conifer</b>                       | 0.4          | 0–3           | 2–5        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 20.0° | 6–30°  |
| <b>Large rock cover</b>  | 3.9%  | 0–20%  |
| <b>Small rock cover</b>  | 16.4% | 0–40%  |
| <b>Bare ground cover</b> | 40.8% | 16–88% |
| <b>Litter cover</b>      | 35.5% | 10–70% |

**Associations within this Alliance:**

*Ceanothus cuneatus* – *Adenostoma fasciculatum* Association

**STAND TABLE**

***Ceanothus cuneatus* Alliance**

n = 7

| Lifeform                               | Code  | Botanical Name                                  | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | PIAT  | <i>Pinus attenuata</i>                          | 29  | 3.2  | 0.2  | 6.2  |
|  | ARME  | <i>Arbutus menziesii</i>                        | 29  | 0.2  | 0.2  | 0.2  |
|  | QUAG  | <i>Quercus agrifolia</i>                        | 29  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | CECU  | <i>Ceanothus cuneatus</i>                       | 100 | 38.1 | 18.0 | 55.0 |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                  | 100 | 26.3 | 10.0 | 48.0 |
|  | ERCA6 | <i>Eriodictyon californicum</i>                 | 57  | 0.2  | 0.2  | 0.2  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                  | 43  | 0.5  | 0.2  | 1.0  |
|  | QUWIF | <i>Quercus wislizeni</i> var. <i>frutescens</i> | 29  | 5.5  | 4.0  | 7.0  |
|  | QUDU4 | <i>Quercus durata</i>                           | 29  | 3.5  | 2.0  | 5.0  |
|  | ARGL3 | <i>Arctostaphylos glandulosa</i>                | 29  | 3.0  | 2.0  | 4.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                 | 29  | 2.1  | 0.2  | 4.0  |

**STAND TABLE** continued

***Ceanothus cuneatus* Alliance**

n = 7

| Lifeform     | Code  | Botanical Name                    | Con | Avg | Min | Max |
|--------------|-------|-----------------------------------|-----|-----|-----|-----|
| Shrub        | TODI  | <i>Toxicodendron diversilobum</i> | 29  | 0.6 | 0.2 | 1.0 |
|              | BAPI  | <i>Baccharis pilularis</i>        | 29  | 0.2 | 0.2 | 0.2 |
| Herb         |       |                                   |     |     |     |     |
|              | CHPO3 | <i>Chlorogalum pomeridianum</i>   | 29  | 0.2 | 0.2 | 0.2 |
| Non-vascular |       |                                   |     |     |     |     |
|              | 2MOSS | Moss                              | 43  | 0.8 | 0.2 | 2.0 |

***Ceanothus cuneatus* – *Adenostoma fasciculatum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (6) and Coastal Franciscan/263Ag (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 70.0         | 60–80         | –          |
| Herb                          | 1.2          | 0–5           | <0.5–0.5   |
| Shrub                         | 68.1         | 60–75         | 1–2        |
| Regenerating/understory tree* | 0.9          | 0–6           | 2–5        |
| Hardwood                      | 0.1          | 0–0.2         | –          |
| Conifer                       | 0.4          | 0–3           | 2–5        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (1), SW (3), variable (2)

**Macrotopography:** middle 1/3 of slope (1), middle to upper 1/3 of slope (1), upper 1/3 of slope (4), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (6), undulating (1)

**Parent material:** Franciscan melange (6), sandstone (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (5), steep/>25° (2)

|                   | Mean     | Range         |
|-------------------|----------|---------------|
| Elevation         | 2032 ft. | 1514–2831 ft. |
| Slope             | 20.0°    | 6–30°         |
| Large rock cover  | 3.9%     | 0–20%         |
| Small rock cover  | 16.4%    | 0–40%         |
| Bare ground cover | 40.8%    | 16–88%        |
| Litter cover      | 35.5%    | 10–70%        |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** SONO0078, SONO0126, SONO0249, SONO0595, SONO0697, SONO0985, SONO2022

**Relevés:** none

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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SCV Global/State Rank: G4/S4<sup>1</sup>

**STAND TABLE**

***Ceanothus cuneatus* – *Adenostoma fasciculatum* Association**

n = 7

| Lifeform                               | Code  | Botanical Name                                  | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | PIAT  | <i>Pinus attenuata</i>                          | 29  | 3.2  | 0.2  | 6.2  |
|  | ARME  | <i>Arbutus menziesii</i>                        | 29  | 0.2  | 0.2  | 0.2  |
|  | QUAG  | <i>Quercus agrifolia</i>                        | 29  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | CECU  | <i>Ceanothus cuneatus</i>                       | 100 | 38.1 | 18.0 | 55.0 |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                  | 100 | 26.3 | 10.0 | 48.0 |
|  | ERCA6 | <i>Eriodictyon californicum</i>                 | 57  | 0.2  | 0.2  | 0.2  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                  | 43  | 0.5  | 0.2  | 1.0  |
|  | QUWIF | <i>Quercus wislizeni</i> var. <i>frutescens</i> | 29  | 5.5  | 4.0  | 7.0  |
|  | QUDU4 | <i>Quercus durata</i>                           | 29  | 3.5  | 2.0  | 5.0  |
|  | ARGL3 | <i>Arctostaphylos glandulosa</i>                | 29  | 3.0  | 2.0  | 4.0  |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                 | 29  | 2.1  | 0.2  | 4.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>               | 29  | 0.6  | 0.2  | 1.0  |
|  | BAPI  | <i>Baccharis pilularis</i>                      | 29  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |   |     |      |      |      |
|  | CHPO3 | <i>Chlorogalum pomeridianum</i>                 | 29  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |       |   |     |      |      |      |
|  | 2MOSS | Moss  | 43  | 0.8  | 0.2  | 2.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Ceanothus oliganthus* Alliance**

### **Hairy leaf ceanothus chaparral**

Statewide (Sawyer et al. 2009)

*Ceanothus oliganthus* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Adenostoma sparsifolium*, *Arctostaphylos glandulosa*, *Ceanothus megacarpus*, *Ceanothus tomentosus*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Rhus ovata*, *Salvia mellifera*, *Toxicodendron diversilobum*, and *Xylococcus bicolor*. Emergent trees may be present at low cover, including *Calocedrus decurrens*, *Juglans californica*, *Pseudotsuga macrocarpa*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus wislizeni*, or *Umbellularia californica*.

Stands of *Ceanothus oliganthus* tend to occur as small, localized patches after recent fire disturbance, and they senesce after about 30-40 years. These stands occur on northerly slopes or adjacent to riparian areas in southern California, and they occur on a wide range of slopes and exposures in central California.

#### Sonoma County

Although *Ceanothus oliganthus* is a common shrub in post-fire chaparral in other parts of the county (e.g., The Geysers), only one stand was sampled meeting the definition of the alliance. That stand was very small and was associated with an old cleared site adjacent to a dirt road. Following recent fires it is possible that more *Ceanothus oliganthus* stands will be identified in Sonoma County.

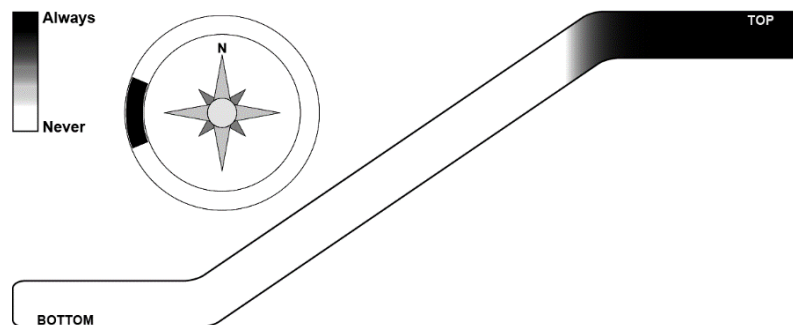
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#### **Local Alliance Summary (n = 1)**

**Elevation:** 911 ft

**SCV Global/State Rank:** G3/S3<sup>1</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 65            | –          |
| <b>Herb</b>                          | 6.0          | 6             | <0.5–0.5   |
| <b>Shrub</b>                         | 55.0         | 55            | 2–5        |
| <b>Regenerating/understory tree*</b> | 11.0         | 11            | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 20.0° | 20°   |
| <b>Large rock cover</b>  | 0.4%  | 0.4%  |
| <b>Small rock cover</b>  | 13.0% | 13%   |
| <b>Bare ground cover</b> | 35.0% | 35%   |
| <b>Litter cover</b>      | 50.0% | 50%   |

**Associations within this Alliance:**

*Ceanothus oliganthus* Association

**STAND TABLE**

***Ceanothus oliganthus* Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>                     | 100 | 5.0  | 5.0  | 5.0  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                            | 100 | 3.2  | 3.2  | 3.2  |
|  | ARME   | <i>Arbutus menziesii</i>                                | 100 | 2.2  | 2.2  | 2.2  |
|  | SESE3  | <i>Sequoia sempervirens</i>                             | 100 | 2.0  | 2.0  | 2.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | CEOL   | <i>Ceanothus oliganthus</i>                             | 100 | 28.0 | 28.0 | 28.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                              | 100 | 7.0  | 7.0  | 7.0  |
|  | ARCO3  | <i>Arctostaphylos columbiana</i>                        | 100 | 3.0  | 3.0  | 3.0  |
|  | LOSC2  | <i>Lotus scoparius</i>                                  | 100 | 1.0  | 1.0  | 1.0  |
|  | CEGR2  | <i>Ceanothus griseus</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | WHMO   | <i>Whipplea modesta</i>                                 | 100 | 15.0 | 15.0 | 15.0 |
|  | CYEC   | <i>Cynosurus echinatus</i>                              | 100 | 1.0  | 1.0  | 1.0  |
|  | HYGL2  | <i>Hypochaeris glabra</i>                               | 100 | 1.0  | 1.0  | 1.0  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>        | 100 | 1.0  | 1.0  | 1.0  |
|  | BROMU  | <i>Bromus</i>   | 100 | 0.2  | 0.2  | 0.2  |
|  | COSE4  | <i>Cortaderia selloana</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|  | PLANT  | <i>Plantago</i>   | 100 | 0.2  | 0.2  | 0.2  |
|  | PSCAB  | <i>Pseudognaphalium canescens</i> ssp. <i>beneolens</i> | 100 | 0.2  | 0.2  | 0.2  |

***Ceanothus oliganthus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 65            | –          |
| <b>Herb</b>                          | 6.0          | 6             | <0.5–0.5   |
| <b>Shrub</b>                         | 55.0         | 55            | 2–5        |
| <b>Regenerating/understory tree*</b> | 11.0         | 11            | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1)  
**Macrotopography:** upper 1/3 of slope (1)  
**Microtopography:** concave (1)  
**Parent material:** sandstone (1)  
**Soil texture:** no data  
**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 911 ft. | 911 ft. |
| <b>Slope</b>             | 20.0°   | 20°     |
| <b>Large rock cover</b>  | 0.4%    | 0.4%    |
| <b>Small rock cover</b>  | 13.0%   | 13%     |
| <b>Bare ground cover</b> | 35.0%   | 35%     |
| <b>Litter cover</b>      | 50.0%   | 50%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0870  
**Relevés:** none

**SCV Global/State Rank:** G4?/S4?<sup>1</sup>

**STAND TABLE**

***Ceanothus oliganthus* Association**

n = 1

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | NODE3 | <i>Notholithocarpus densiflorus</i>                 | 100 | 5.0  | 5.0  | 5.0  |
|  | PSME  | <i>Pseudotsuga menziesii</i>                        | 100 | 3.2  | 3.2  | 3.2  |
|  | ARME  | <i>Arbutus menziesii</i>                            | 100 | 2.2  | 2.2  | 2.2  |
|  | SESE3 | <i>Sequoia sempervirens</i>                         | 100 | 2.0  | 2.0  | 2.0  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | CEOL  | <i>Ceanothus oliganthus</i>                         | 100 | 28.0 | 28.0 | 28.0 |
|  | BAPI  | <i>Baccharis pilularis</i>                          | 100 | 7.0  | 7.0  | 7.0  |
|  | ARCO3 | <i>Arctostaphylos columbiana</i>                    | 100 | 3.0  | 3.0  | 3.0  |
|  | LOSC2 | <i>Lotus scoparius</i>                              | 100 | 1.0  | 1.0  | 1.0  |
|  | CEGR2 | <i>Ceanothus griseus</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 100 | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**STAND TABLE** continued

***Ceanothus oliganthus* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                   | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | WHMO        | <i>Whipplea modesta</i>                                 | 100        | 15.0       | 15.0       | 15.0       |
|                 | CYEC        | <i>Cynosurus echinatus</i>                              | 100        | 1.0        | 1.0        | 1.0        |
|                 | HYGL2       | <i>Hypochaeris glabra</i>                               | 100        | 1.0        | 1.0        | 1.0        |
|                 | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i>        | 100        | 1.0        | 1.0        | 1.0        |
|                 | COSE4       | <i>Cortaderia selloana</i>                              | 100        | 0.2        | 0.2        | 0.2        |
|                 | PLANT       | <i>Plantago</i>   | 100        | 0.2        | 0.2        | 0.2        |
|                 | PSCAB       | <i>Pseudognaphalium canescens</i> ssp. <i>beneolens</i> | 100        | 0.2        | 0.2        | 0.2        |
|                 | BROMU       | <i>Bromus</i>   | 100        | 0.2        | 0.2        | 0.2        |

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## ***Ceanothus thyrsiflorus* Alliance**

### **Blue blossom chaparral**

Statewide (Sawyer et al. 2009)

*Ceanothus thyrsiflorus* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos manzanita*, *Baccharis pilularis*, *Ceanothus incanus*, *Ceanothus integerrimus*, *Ceanothus velutinus*, *Gaultheria shallon*, *Heteromeles arbutifolia*, *Lupinus arboreus*, *Quercus berberidifolia*, *Rubus ursinus*, *Toxicodendron diversilobum*, and *Vaccinium ovatum*. Emergent conifer trees may be present at low cover.

The most extensive *Ceanothus thyrsiflorus* stands establish after logging or burning in the outer Coast Ranges of central and northern California. These stands persist for a few decades and are seral to stands of the *Pinus muricata*, *Pseudotsuga menziesii* – *Notholithocarpus densiflorus*, and *Sequoia sempervirens* Alliances. Stands on exposed coastal headlands persist for long periods and are frequently associated with *Baccharis pilularis* and *Lupinus arboreus* Alliance shrublands.

#### Sonoma County

Stands assigned to the *Ceanothus thyrsiflorus* Alliance are small and uncommon in Sonoma County. Those sampled are associated with small openings due to logging or clearing in forests of the *Pseudotsuga menziesii* – *Notholithocarpus densiflorus* Alliance. All of the sampled stands are less than an acre in size and they may best be considered a seral community within recent clearings of Douglas-fir or related forests. All three sampled stands are dominated by *Ceanothus incanus*, a large shrub ecologically and taxonomically related to *Ceanothus thyrsiflorus*. Until further sampling takes place, the physical and ecological similarity of *Ceanothus incanus* to *C. thyrsiflorus* justifies the temporary placement of these three stands into the *Ceanothus thyrsiflorus* Alliance. Individuals of *Ceanothus thyrsiflorus* do occur in Sonoma County, particularly close to the coast. However, no stands of *C. thyrsiflorus* have been observed or sampled in Sonoma County to date.

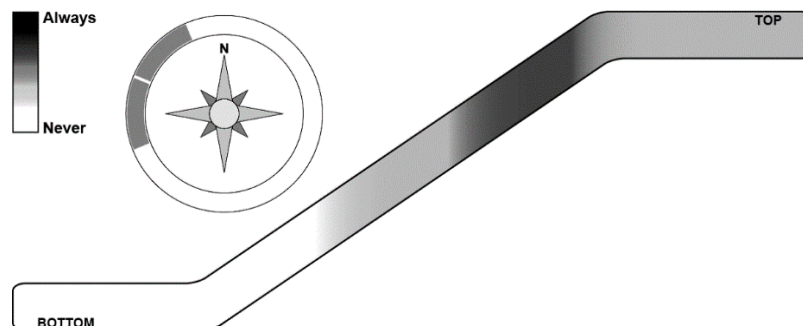
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#### **Local Alliance Summary (n = 3)**

**Elevation:** 1586–2306 ft, mean 2047 ft

**SCV Global/State Rank:** G4/S4<sup>1</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 73.3         | 68–80         | –          |
| <b>Herb</b>                          | 5.3          | 0–14          | <0.5–1     |
| <b>Shrub</b>                         | 66.0         | 62–71         | 2–5        |
| <b>Regenerating/understory tree*</b> | 2.1          | 0.2–4         | 2–5        |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 5–10       |
| <b>Conifer</b>                       | 3.7          | 3–4           | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.0° | 1–28°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 2.7%  | 0–5%   |
| <b>Bare ground cover</b> | 41.5% | 13–70% |
| <b>Litter cover</b>      | 54.5% | 24–85% |

**Associations within this Alliance:**

*Ceanothus incanus* Provisional Association

**STAND TABLE**

***Ceanothus thyrsiflorus* Alliance**

n = 3

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                        | 100 | 3.7  | 3.0  | 4.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>                   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                        | 67  | 2.5  | 2.0  | 3.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                            | 67  | 0.3  | 0.2  | 0.4  |
|  | UMCA   | <i>Umbellularia californica</i>                       | 33  | 1.0  | 1.0  | 1.0  |
|  | PIPO   | <i>Pinus ponderosa</i>                                | 33  | 0.2  | 0.2  | 0.2  |
|  | QUWI2  | * <i>Quercus wislizeni</i>                            | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | CEIN   | <i>Ceanothus incanus</i>                              | 100 | 55.0 | 55.0 | 55.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                            | 100 | 5.3  | 3.0  | 9.0  |
|  | RUUR   | <i>Rubus ursinus</i>                                  | 67  | 5.0  | 2.0  | 8.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                        | 67  | 2.5  | 1.0  | 4.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>   | 67  | 0.2  | 0.2  | 0.2  |
|  | ARCAC7 | <i>Arctostaphylos canescens</i> ssp. <i>canescens</i> | 33  | 4.0  | 4.0  | 4.0  |
|  | CECU   | <i>Ceanothus cuneatus</i>                             | 33  | 3.0  | 3.0  | 3.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                     | 33  | 3.0  | 3.0  | 3.0  |
|  | RULE   | <i>Rubus leucodermis</i>                              | 33  | 2.0  | 2.0  | 2.0  |
|  | QUWIF  | * <i>Quercus wislizeni</i> var. <i>frutescens</i>     | 33  | 1.0  | 1.0  | 1.0  |
|  | LOSC2  | <i>Lotus scoparius</i>                                | 33  | 0.2  | 0.2  | 0.2  |
|  | RIBES  | <i>Ribes</i>  | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Ceanothus thyrsiflorus* Alliance**

n = 3

| Lifeform     | Code   | Botanical Name                                   | Con | Avg | Min | Max  |
|--------------|--------|--|-----|-----|-----|------|
| Shrub        |        |  |     |     |     |      |
|              | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i>        | 33  | 0.2 | 0.2 | 0.2  |
| Herb         |        |  |     |     |     |      |
|              | HYPE   | <i>Hypericum perforatum</i>                      | 67  | 6.6 | 0.2 | 13.0 |
|              | AVENA  | <i>Avena</i>                                     | 33  | 0.2 | 0.2 | 0.2  |
|              | CESO3  | <i>Centaurea solstitialis</i>                    | 33  | 0.2 | 0.2 | 0.2  |
|              | CYEC   | <i>Cynosurus echinatus</i>                       | 33  | 0.2 | 0.2 | 0.2  |
|              | ELGL   | <i>Elymus glaucus</i>                            | 33  | 0.2 | 0.2 | 0.2  |
|              | GAPH2  | <i>Gastidium phleoides</i>                       | 33  | 0.2 | 0.2 | 0.2  |
|              | GNAPH  | <i>Gnaphalium</i>                                | 33  | 0.2 | 0.2 | 0.2  |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33  | 0.2 | 0.2 | 0.2  |
|              | STACH  | <i>Stachys</i>                                   | 33  | 0.2 | 0.2 | 0.2  |
|              | TACA8  | <i>Taeniatherum caput-medusae</i>                | 33  | 0.2 | 0.2 | 0.2  |
|              | VETH   | <i>Verbascum thapsus</i>                         | 33  | 0.2 | 0.2 | 0.2  |
| Non-vascular |        |  |     |     |     |      |
|              | 2MOSS  | Moss   | 33  | 2.0 | 2.0 | 2.0  |

***Ceanothus incanus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 73.3         | 68–80         | –          |
| Herb                          | 5.3          | 0–14          | <0.5–1     |
| Shrub                         | 66.0         | 62–71         | 2–5        |
| Regenerating/understory tree* | 2.1          | 0.2–4         | 2–5        |
| Hardwood                      | 0.1          | 0–0.2         | 5–10       |
| Conifer                       | 3.7          | 3–4           | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SW (1), variable (1)

**Macrotopography:** middle 1/3 of slope (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (1), flat (1)

**Parent material:** sandstone (2), sedimentary (1)

**Soil texture:** unknown (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1), steep/>25° (1)

|                  | Mean     | Range         |
|------------------|----------|---------------|
| Elevation        | 2047 ft. | 1586–2306 ft. |
| Slope            | 16.0°    | 1–28°         |
| Large rock cover | 0.0%     | 0–0%          |
| Small rock cover | 2.7%     | 0–5%          |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Bare ground cover | 41.5% | 13–70% |
| Litter cover      | 54.5% | 24–85% |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0830, SONO0907, SONO0955

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Ceanothus incanus* Provisional Association**

n = 3

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                        | 100 | 3.7  | 3.0  | 4.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|  | NODE3  | <i>Notholithocarpus densiflorus</i>                   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                        | 67  | 2.5  | 2.0  | 3.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                            | 67  | 0.3  | 0.2  | 0.4  |
|  | UMCA   | <i>Umbellularia californica</i>                       | 33  | 1.0  | 1.0  | 1.0  |
|  | QUWI2  | * <i>Quercus wislizeni</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|  | PIPO   | <i>Pinus ponderosa</i>                                | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | CEIN   | <i>Ceanothus incanus</i>                              | 100 | 55.0 | 55.0 | 55.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                            | 100 | 5.3  | 3.0  | 9.0  |
|  | RUUR   | <i>Rubus ursinus</i>                                  | 67  | 5.0  | 2.0  | 8.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                        | 67  | 2.5  | 1.0  | 4.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>   | 67  | 0.2  | 0.2  | 0.2  |
|  | ARCAC7 | <i>Arctostaphylos canescens</i> ssp. <i>canescens</i> | 33  | 4.0  | 4.0  | 4.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                     | 33  | 3.0  | 3.0  | 3.0  |
|  | CECU   | <i>Ceanothus cuneatus</i>                             | 33  | 3.0  | 3.0  | 3.0  |
|  | RULE   | <i>Rubus leucodermis</i>                              | 33  | 2.0  | 2.0  | 2.0  |
|  | QUWIF  | * <i>Quercus wislizeni</i> var. <i>frutescens</i>     | 33  | 1.0  | 1.0  | 1.0  |
|  | LOSC2  | <i>Lotus scoparius</i>                                | 33  | 0.2  | 0.2  | 0.2  |
|  | RIBES  | <i>Ribes</i>  | 33  | 0.2  | 0.2  | 0.2  |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i>             | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | HYPE   | <i>Hypericum perforatum</i>                           | 67  | 6.6  | 0.2  | 13.0 |
|  | CYEC   | <i>Cynosurus echinatus</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|  | ELGL   | <i>Elymus glaucus</i>                                 | 33  | 0.2  | 0.2  | 0.2  |
|  | GAPH2  | <i>Gastrium phleoides</i>                             | 33  | 0.2  | 0.2  | 0.2  |
|  | GNAPH  | <i>Gnaphalium</i>                                     | 33  | 0.2  | 0.2  | 0.2  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>      | 33  | 0.2  | 0.2  | 0.2  |
|  | STACH  | <i>Stachys</i>  | 33  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Ceanothus incanus* Provisional Association**

n = 3

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                   |            |            |            |            |
|                     | TACA8       | <i>Taeniatherum caput-medusae</i> | 33         | 0.2        | 0.2        | 0.2        |
|                     | VETH        | <i>Verbascum thapsus</i>          | 33         | 0.2        | 0.2        | 0.2        |
|                     | AVENA       | <i>Avena</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | CESO3       | <i>Centaurea solstitialis</i>     | 33         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                                   |            |            |            |            |
|                     | 2MOSS       | Moss                              | 33         | 2.0        | 2.0        | 2.0        |

***Cercocarpus montanus* Alliance**  
**Birch leaf mountain mahogany chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Cercocarpus montanus* is dominant or co-dominant in the shrub or small tree canopy with *Adenostoma fasciculatum*, *Adenostoma sparsifolium*, *Arctostaphylos glandulosa*, *Arctostaphylos glauca*, *Artemisia californica*, *Ceanothus crassifolius*, *Ceanothus cuneatus*, *Ceanothus megacarpus*, *Ceanothus spinosus*, *Eriogonum fasciculatum*, *Eriogonum wrightii*, *Fremontodendron californicum*, *Garrya flavescens*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Malosma laurina*, *Prunus ilicifolia*, *Quercus berberidifolia*, *Quercus john-tuckeri*, *Rhamnus ilicifolia*, *Salvia apiana*, and *Salvia mellifera*. Emergent trees may be present at low cover, including *Juglans californica*, *Juniperus californica*, *Pinus monophylla*, *Pinus sabiniana*, *Platanus racemosa*, *Quercus agrifolia*, *Quercus chrysolepis*, *Quercus douglasii*, or *Umbellularia californica*.

Most *Cercocarpus montanus* stands are open and they frequently occur on alluvial deposits along stream terraces or on steep, north-facing slopes, where the plant dominates on rocky ridges and steep slopes with thin soil (Uchytel 1991b). They typically occupy rockier sites than do denser *Ceanothus*- and *Quercus*-dominated chaparral types. In many recent taxonomic treatments, *Cercocarpus montanus* is considered to be a widespread polymorphic species throughout the western United States, with several varieties occurring in California. Since the varieties have similar ecology, all are included in this alliance. The most recent California reference (UCB 2004-2013) uses the names *Cercocarpus betuloides* for *C. montanus* and *Cercocarpus minutiflorus* for *C. montanus* var. *minutiflorus*.

Sonoma County

Stands of *Cercocarpus montanus* are infrequent in the county. They tend to occur well inland from the immediate coast on steep, rocky slopes, usually surrounded by oak woodland or Douglas-fir forest. Unlike *Cercocarpus montanus* stands in much of drier central and southern California, stands in Sonoma County have been found primarily on south-facing slopes where these rugged, slow-growing shrubs can outcompete the more moisture-loving tree species.

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**Local Alliance Summary (n = 2)**

**Elevation:** 243–1233 ft, mean 738 ft

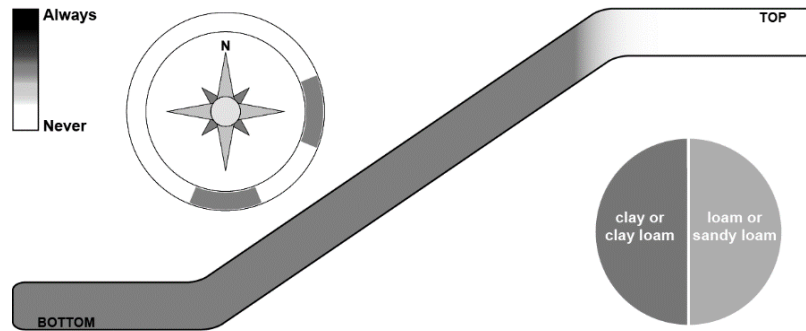
**SCV Global/State Rank:** G5/S4<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 52.5         | 50–55         | –          |
| <b>Herb</b>                          | 13.0         | 6–20          | <0.5–0.5   |
| <b>Shrub</b>                         | 40.0         | 40            | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 27.0° | 18–36° |
| <b>Large rock cover</b>  | 1.0%  | 0–2%   |
| <b>Small rock cover</b>  | 17.5% | 17–18% |
| <b>Bare ground cover</b> | 12.5% | 10–15% |
| <b>Litter cover</b>      | 66.5% | 63–70% |

**Associations within this Alliance:**

*Cercocarpus montanus* – *Adenostoma fasciculatum* Association

**STAND TABLE**

***Cercocarpus montanus* Alliance**

n = 2

| Lifeform                               | Code  | Botanical Name  | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            | UMCA  | <i>Umbellularia californica</i>                         | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> | AECA  | <i>Aesculus californica</i>                             | 50  | 2.0  | 2.0  | 2.0  |
| <b>Shrub</b>                           | CEMOG | <i>Cercocarpus montanus</i> var. <i>glaber</i>          | 100 | 25.5 | 16.0 | 35.0 |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                          | 100 | 13.0 | 7.0  | 19.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i>                       | 100 | 1.0  | 1.0  | 1.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 50  | 4.0  | 4.0  | 4.0  |
|  | CECU  | <i>Ceanothus cuneatus</i>                               | 50  | 3.0  | 3.0  | 3.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                          | 50  | 3.0  | 3.0  | 3.0  |
|  | ARMAG | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 50  | 2.0  | 2.0  | 2.0  |
|  | BAPI  | <i>Baccharis pilularis</i>                              | 50  | 0.2  | 0.2  | 0.2  |



**STAND TABLE** continued

***Cercocarpus montanus* Alliance**

n = 2

| Lifeform     | Code  | Botanical Name                  | Con | Avg | Min | Max |
|--------------|-------|---------------------------------|-----|-----|-----|-----|
| Shrub        | LOHI2 | <i>Lonicera hispidula</i>       | 50  | 0.2 | 0.2 | 0.2 |
|              | QUBE5 | <i>Quercus berberidifolia</i>   | 50  | 0.2 | 0.2 | 0.2 |
| Herb         | BROMU | <i>Bromus</i>                   | 50  | 2.0 | 2.0 | 2.0 |
|              | CYEC  | <i>Cynosurus echinatus</i>      | 50  | 0.2 | 0.2 | 0.2 |
|              | PETR7 | <i>Pentagramma triangularis</i> | 50  | 0.2 | 0.2 | 0.2 |
| Non-vascular | 2MOSS | Moss                            | 50  | 5.0 | 5.0 | 5.0 |

***Cercocarpus montanus* – *Adenostoma fasciculatum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 52.5         | 50–55         | –          |
| Herb                          | 13.0         | 6–20          | <0.5–0.5   |
| Shrub                         | 40.0         | 40            | 2–5        |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.1          | 0–0.2         | 5–10       |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (2)

**Macrotopography:** bottom to mid 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (1), convex (1)

**Parent material:** basalt (1), metasedimentary (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (1), steep/>25° (1)

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 738 ft. | 243–1233 ft. |
| Slope             | 27.0°   | 18–36°       |
| Large rock cover  | 1.0%    | 0–2%         |
| Small rock cover  | 17.5%   | 17–18%       |
| Bare ground cover | 12.5%   | 10–15%       |
| Litter cover      | 66.5%   | 63–70%       |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** MILOB010, SONO0318

**Relevés:** none

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SCV Global/State Rank: G3G4?/S3S4?<sup>1</sup>

**STAND TABLE**

***Cercocarpus montanus* – *Adenostoma fasciculatum* Association**

n = 2

| Lifeform                               | Code  | Botanical Name  | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            |       |   |     |      |      |      |
|  | UMCA  | <i>Umbellularia californica</i>                         | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | AECA  | <i>Aesculus californica</i>                             | 50  | 2.0  | 2.0  | 2.0  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | CEMOG | <i>Cercocarpus montanus</i> var. <i>glaber</i>          | 100 | 25.5 | 16.0 | 35.0 |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                          | 100 | 13.0 | 7.0  | 19.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i>                       | 100 | 1.0  | 1.0  | 1.0  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 50  | 4.0  | 4.0  | 4.0  |
|  | CECU  | <i>Ceanothus cuneatus</i>                               | 50  | 3.0  | 3.0  | 3.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                          | 50  | 3.0  | 3.0  | 3.0  |
|  | ARMAG | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 50  | 2.0  | 2.0  | 2.0  |
|  | BAPI  | <i>Baccharis pilularis</i>                              | 50  | 0.2  | 0.2  | 0.2  |
|  | LOHI2 | <i>Lonicera hispidula</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|  | QUBE5 | <i>Quercus berberidifolia</i>                           | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |   |     |      |      |      |
|  | BROMU | <i>Bromus</i>   | 50  | 2.0  | 2.0  | 2.0  |
|  | CYEC  | <i>Cynosurus echinatus</i>                              | 50  | 0.2  | 0.2  | 0.2  |
|  | PETR7 | <i>Pentagramma triangularis</i>                         | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |       |   |     |      |      |      |
|  | 2MOSS | Moss  | 50  | 5.0  | 5.0  | 5.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Eriodictyon californicum* – *Lupinus albifrons* Provisional Alliance** **California yerba santa – silver bush lupine scrub**

Statewide (Sawyer et al. 2009<sup>1</sup>)

The two nominate species of this alliance were given separate alliance status in Sawyer et al. (2009). Recently, the peer review panel of the NVC suggested merging them into a single alliance; the new convention is followed here. *Eriodictyon californicum* or *Lupinus albifrons* dominates or co-dominates in the shrub canopy with *Adenostoma fasciculatum*, *Ceanothus cuneatus*, *Diplacus aurantiacus*, *Eriogonum fasciculatum*, *Eriophyllum confertiflorum*, *Hesperoyucca whipplei*, *Lotus scoparius*, *Sambucus nigra*, *Senecio flaccidus*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Pinus sabiniana*, *Quercus douglasii*, or *Quercus wislizeni*.

*Lupinus albifrons* and *Eriodictyon californicum* regularly form stands in recently burned chaparral, in grazed or cleared shrublands, or in other disturbed areas. In the Sierra Nevada foothills, these seral stands become invaded by other shrubs or by trees as the stands age, and they transition to *Ceanothus cuneatus* shrublands or *Quercus douglasii* or *Q. wislizeni* woodlands if not disturbed further (Klein et al. 2007). *Lupinus albifrons* forms stands on stabilized dunes on the Channel Islands of southern California. Although the *Lupinus albifrons* shrub is relatively short-lived, the stands reestablish from a persistent seed bank. Other stand-forming species of *Eriodictyon* (*E. crassifolium*, *E. trichocalyx*) are currently considered part of this alliance.

### Sonoma County

Stands of this alliance fall into two distinct categories in Sonoma County: those dominated by *Lupinus albifrons* and those dominated by *Eriodictyon californicum*. The five samples of *Eriodictyon californicum* / Herbaceous Association all occur far inland (more than 30 km from the coast) and are usually adjacent to stands of mature chaparral. The stands dominated by *Lupinus albifrons* are often surrounded by grassland rather than chaparral, and may occur either close to the coast or far inland.

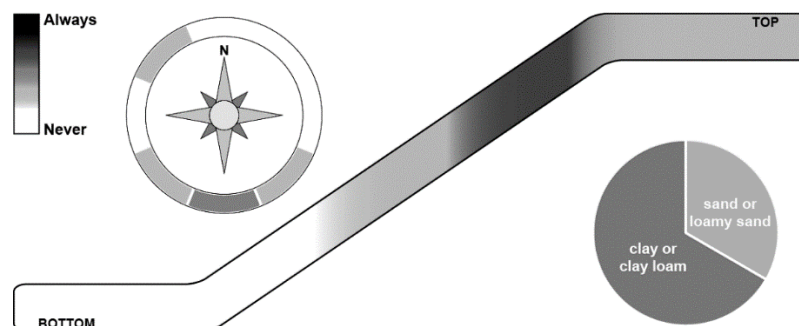
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### **Local Alliance Summary (n = 9)**

**Elevation:** 756–2409 ft, mean 1759 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 34.7         | 20–55         | –          |
| <b>Herb</b>                          | 18.2         | 6–30          | <0.5–1     |
| <b>Shrub</b>                         | 18.2         | 6–26          | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.6          | 0–5           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0.2         | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 27.0° | 13–40° |
| <b>Large rock cover</b>  | 3.8%  | 0–8%   |
| <b>Small rock cover</b>  | 24.2% | 0–71%  |
| <b>Bare ground cover</b> | 30.1% | 7–70%  |
| <b>Litter cover</b>      | 39.9% | 5–82%  |

**Associations within this Alliance:**

*Eriodictyon californicum* / Herbaceous Association  
*Lupinus albifrons* Association

**STAND TABLE**

***Eriodictyon californicum* – *Lupinus albifrons* Provisional Alliance**

n = 9

| Lifeform     | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> | ERCA6  | <i>Eriodictyon californicum</i>                      | 56  | 19.6 | 12.0 | 25.0 |
|              | LUAL4  | <i>Lupinus albifrons</i>                             | 44  | 13.8 | 6.0  | 26.0 |
|              | BAPI   | <i>Baccharis pilularis</i>                           | 22  | 1.1  | 0.2  | 2.0  |
|              | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>  | 22  | 0.6  | 0.2  | 1.0  |
|              | LOSC2  | <i>Lotus scoparius</i>                               | 22  | 0.6  | 0.2  | 1.0  |
|              | TODI   | <i>Toxicodendron diversilobum</i>                    | 22  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>  | AVBA   | <i>Avena barbata</i>                                 | 89  | 4.4  | 0.2  | 13.0 |
|              | BRDI2  | <i>Brachypodium distachyon</i>                       | 56  | 4.8  | 0.2  | 14.0 |
|              | BRHO2  | <i>Bromus hordeaceus</i>                             | 44  | 3.3  | 2.0  | 5.0  |
|              | BRDI3  | <i>Bromus diandrus</i>                               | 44  | 2.6  | 0.2  | 7.0  |
|              | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 44  | 0.2  | 0.2  | 0.2  |
|              | BRMA   | <i>Briza maxima</i>                                  | 33  | 9.0  | 3.0  | 15.0 |
|              | NAPU4  | <i>Nassella pulchra</i>                              | 33  | 1.0  | 1.0  | 1.0  |
|              | MECA2  | <i>Melica californica</i>                            | 33  | 0.5  | 0.2  | 1.0  |
|              | ERCI6  | <i>Erodium cicutarium</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|              | BRMA3  | <i>Bromus madritensis</i>                            | 22  | 1.6  | 0.2  | 3.0  |
|              | CRSE11 | <i>Croton setigerus</i>                              | 22  | 1.0  | 1.0  | 1.0  |
|              | ERBO   | <i>Erodium botrys</i>                                | 22  | 0.6  | 0.2  | 1.0  |
|              | LOGA2  | <i>Logfia gallica</i>                                | 22  | 0.2  | 0.2  | 0.2  |
|              | PHIM   | <i>Phacelia imbricata</i>                            | 22  | 0.2  | 0.2  | 0.2  |
|              | SHAR2  | <i>Sherardia arvensis</i>                            | 22  | 0.2  | 0.2  | 0.2  |
|              | TRHI4  | <i>Trifolium hirtum</i>                              | 22  | 0.2  | 0.2  | 0.2  |

**STAND TABLE** continued

***Eriodictyon californicum* – *Lupinus albifrons* Provisional Alliance**

n = 9

| Lifeform            | Code   | Botanical Name | Con | Avg | Min | Max |
|---------------------|--------|----------------|-----|-----|-----|-----|
| <b>Non-vascular</b> |        |                |     |     |     |     |
|                     | 2LICHN | Lichen         | 33  | 1.1 | 0.2 | 2.0 |
|                     | 2MOSS  | Moss           | 33  | 0.5 | 0.2 | 1.0 |

***Eriodictyon californicum* / Herbaceous Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (3) and Coastal Franciscan/263Ag (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 39.8         | 29–55         | –          |
| <b>Herb</b>                          | 21.6         | 10–30         | <0.5–1     |
| <b>Shrub</b>                         | 21.2         | 16–25         | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 1.0          | 0–5           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (2), SW (1), variable (1)

**Macrotopography:** middle 1/3 of slope (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (3)

**Microtopography:** convex (2), undulating (3)

**Parent material:** Franciscan melange (2), sandstone (1), sedimentary (1), serpentine (1)

**Soil texture:** sand (1)

**Slope steepness:** moderate/6-25° (3), steep/>25° (2)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 1779 ft. | 1598–1944 ft. |
| <b>Slope</b>             | 22.8°    | 13–30°        |
| <b>Large rock cover</b>  | 2.8%     | 0–7%          |
| <b>Small rock cover</b>  | 23.3%    | 2–44%         |
| <b>Bare ground cover</b> | 20.0%    | 7–45%         |
| <b>Litter cover</b>      | 51.8%    | 40–82%        |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0071, SONO0077, SONO0352, SONO0967, SONO2023

**Relevés:** none

**SCV Global/State Rank:** G4?/S4?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Eriodictyon californicum* / Herbaceous Association**

n = 5

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUAG   | * <i>Quercus agrifolia</i>                              | 20  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUCH2  | <i>Quercus chrysolepis</i>                              | 20  | 2.0  | 2.0  | 2.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>                              | 20  | 2.0  | 2.0  | 2.0  |
|  | UMCA   | <i>Umbellularia californica</i>                         | 20  | 1.0  | 1.0  | 1.0  |
|  | PIAT   | <i>Pinus attenuata</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ERCA6  | <i>Eriodictyon californicum</i>                         | 100 | 19.6 | 12.0 | 25.0 |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 40  | 0.6  | 0.2  | 1.0  |
|  | LOSC2  | <i>Lotus scoparius</i>                                  | 40  | 0.6  | 0.2  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                          | 20  | 1.0  | 1.0  | 1.0  |
|  | VICA5  | <i>Vitis californica</i>                                | 20  | 1.0  | 1.0  | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                       | 20  | 0.2  | 0.2  | 0.2  |
|  | ARMAG  | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 20  | 0.2  | 0.2  | 0.2  |
|  | BAPI   | <i>Baccharis pilularis</i>                              | 20  | 0.2  | 0.2  | 0.2  |
|  | CECU   | <i>Ceanothus cuneatus</i>                               | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AVBA   | <i>Avena barbata</i>                                    | 80  | 6.0  | 1.0  | 13.0 |
|  | BRMA   | <i>Briza maxima</i>                                     | 60  | 9.0  | 3.0  | 15.0 |
|  | BRDI3  | <i>Bromus diandrus</i>                                  | 60  | 3.1  | 0.2  | 7.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                                | 60  | 3.0  | 2.0  | 5.0  |
|  | CRSE11 | <i>Croton setigerus</i>                                 | 40  | 1.0  | 1.0  | 1.0  |
|  | AVENA  | <i>Avena</i>  | 20  | 15.0 | 15.0 | 15.0 |
|  | CESO3  | <i>Centaurea solstitialis</i>                           | 20  | 7.0  | 7.0  | 7.0  |
|  | BRDI2  | <i>Brachypodium distachyon</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|  | AICA   | <i>Aira caryophyllea</i>                                | 20  | 2.0  | 2.0  | 2.0  |
|  | TACA8  | <i>Taeniatherum caput-medusae</i>                       | 20  | 2.0  | 2.0  | 2.0  |
|  | VUMY   | <i>Vulpia myuros</i>                                    | 20  | 2.0  | 2.0  | 2.0  |
|  | MADIA  | <i>Madia</i>  | 20  | 1.0  | 1.0  | 1.0  |
|  | STAL   | <i>Stachys albens</i>                                   | 20  | 1.0  | 1.0  | 1.0  |
|  | PEMU   | <i>Pellaea mucronata</i>                                | 20  | 1.0  | 1.0  | 1.0  |
|  | MOVI2  | <i>Monardella villosa</i>                               | 20  | 1.0  | 1.0  | 1.0  |
|  | MECA2  | <i>Melica californica</i>                               | 20  | 1.0  | 1.0  | 1.0  |
|  | PHIM   | <i>Phacelia imbricata</i>                               | 20  | 0.2  | 0.2  | 0.2  |
|  | TRDE   | <i>Trifolium depauperatum</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|  | TRIFO  | <i>Trifolium</i>  | 20  | 0.2  | 0.2  | 0.2  |
|  | STVI2  | <i>Stephanomeria virgata</i>                            | 20  | 0.2  | 0.2  | 0.2  |
|  | PSCA13 | <i>Pseudognaphalium californicum</i>                    | 20  | 0.2  | 0.2  | 0.2  |
|  | GAPA5  | <i>Galium parisiense</i>                                | 20  | 0.2  | 0.2  | 0.2  |
|  | GALIU  | <i>Galium</i>   | 20  | 0.2  | 0.2  | 0.2  |
|  | ERBO   | <i>Erodium botrys</i>                                   | 20  | 0.2  | 0.2  | 0.2  |
|  | EPBR3  | <i>Epilobium brachycarpum</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|  | ELYMU  | <i>Elymus</i>   | 20  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Eriodictyon californicum* / Herbaceous Association**

n = 5

| Lifeform            | Code   | Botanical Name                                       | Con | Avg | Min | Max |
|---------------------|--------|--|-----|-----|-----|-----|
| <b>Herb</b>         |        |  |     |     |     |     |
|                     | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 20  | 0.2 | 0.2 | 0.2 |
|                     | CYEC   | <i>Cynosurus echinatus</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|                     | COAR4  | <i>Convolvulus arvensis</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|                     | SHAR2  | <i>Sherardia arvensis</i>                            | 20  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |        |  |     |     |     |     |
|                     | 2LICHN | Lichen   | 40  | 0.6 | 0.2 | 1.0 |
|                     | 2MOSS  | Moss   | 40  | 0.6 | 0.2 | 1.0 |

***Lupinus albifrons* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (2), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 28.3         | 20–36         | –          |
| <b>Herb</b>                          | 14.0         | 6–28          | <0.5–1     |
| <b>Shrub</b>                         | 14.5         | 6–26          | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (3)

**Macrotopography:** middle 1/3 of slope (1), upper 1/3 of slope (3)

**Microtopography:** convex (2), undulating (2)

**Parent material:** Franciscan melange (3), metasedimentary (1)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** moderate/6-25° (1), steep/>25° (3)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1734 ft. | 756–2409 ft. |
| <b>Slope</b>             | 32.7°    | 28–40°       |
| <b>Large rock cover</b>  | 4.8%     | 0–8%         |
| <b>Small rock cover</b>  | 25.1%    | 0–71%        |
| <b>Bare ground cover</b> | 40.3%    | 19–70%       |
| <b>Litter cover</b>      | 28.0%    | 5–57%        |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0409, SONO0525, SONO0933, SONO2189

**Relevés:** none

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SCV Global/State Rank: G4?/S4?<sup>1</sup>

**STAND TABLE**

***Lupinus albifrons* Association**

n = 4

| Lifeform | Code                        | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|-----------------------------|--|-----|------|-----|------|
| Shrub    | LUAL4                       | <i>Lupinus albifrons</i>                             | 100 | 13.8 | 6.0 | 26.0 |
|          | BAPI                        | <i>Baccharis pilularis</i>                           | 25  | 2.0  | 2.0 | 2.0  |
|          | TODI                        | <i>Toxicodendron diversilobum</i>                    | 25  | 1.0  | 1.0 | 1.0  |
| Herb     | BRDI2                       | <i>Brachypodium distachyon</i>                       | 100 | 5.3  | 0.2 | 14.0 |
|          | AVBA                        | <i>Avena barbata</i>                                 | 100 | 2.8  | 0.2 | 7.0  |
|          | NAPU4                       | <i>Nassella pulchra</i>                              | 75  | 1.0  | 1.0 | 1.0  |
|          | ERCI6                       | <i>Erodium cicutarium</i>                            | 75  | 0.2  | 0.2 | 0.2  |
|          | DICAC5                      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 75  | 0.2  | 0.2 | 0.2  |
|          | BRMA3                       | <i>Bromus madritensis</i>                            | 50  | 1.6  | 0.2 | 3.0  |
|          | TRHI4                       | <i>Trifolium hirtum</i>                              | 50  | 0.2  | 0.2 | 0.2  |
|          | LOGA2                       | <i>Logfia gallica</i>                                | 50  | 0.2  | 0.2 | 0.2  |
|          | MECA2                       | <i>Melica californica</i>                            | 50  | 0.2  | 0.2 | 0.2  |
|          | BRHO2                       | <i>Bromus hordeaceus</i>                             | 25  | 4.0  | 4.0 | 4.0  |
|          | ERBO                        | <i>Erodium botrys</i>                                | 25  | 1.0  | 1.0 | 1.0  |
|          | ERNU3                       | <i>Eriogonum nudum</i>                               | 25  | 1.0  | 1.0 | 1.0  |
|          | BRDI3                       | <i>Bromus diandrus</i>                               | 25  | 1.0  | 1.0 | 1.0  |
|          | MIGR                        | <i>Microsteris gracilis</i>                          | 25  | 0.2  | 0.2 | 0.2  |
|          | LASE                        | <i>Lactuca serriola</i>                              | 25  | 0.2  | 0.2 | 0.2  |
|          | PHCA                        | <i>Phacelia californica</i>                          | 25  | 0.2  | 0.2 | 0.2  |
|          | SCAND                       | <i>Scandix</i>                                       | 25  | 0.2  | 0.2 | 0.2  |
|          | POLYG4                      | <i>Polygonum</i>                                     | 25  | 0.2  | 0.2 | 0.2  |
|          | PLLA                        | <i>Plantago lanceolata</i>                           | 25  | 0.2  | 0.2 | 0.2  |
|          | PHIM                        | <i>Phacelia imbricata</i>                            | 25  | 0.2  | 0.2 | 0.2  |
|          | PHACE                       | <i>Phacelia</i>                                      | 25  | 0.2  | 0.2 | 0.2  |
|          | MEBU                        | <i>Melica bulbosa</i>                                | 25  | 0.2  | 0.2 | 0.2  |
|          | LOHU2                       | <i>Lotus humistratus</i>                             | 25  | 0.2  | 0.2 | 0.2  |
|          | SHAR2                       | <i>Sherardia arvensis</i>                            | 25  | 0.2  | 0.2 | 0.2  |
|          | LOUT                        | <i>Lomatium utriculatum</i>                          | 25  | 0.2  | 0.2 | 0.2  |
|          | STGL8                       | * <i>Streptanthus glandulosus</i>                    | 25  | 0.2  | 0.2 | 0.2  |
|          | HYGL2                       | <i>Hypochaeris glabra</i>                            | 25  | 0.2  | 0.2 | 0.2  |
|          | GITR2                       | <i>Gilia tricolor</i>                                | 25  | 0.2  | 0.2 | 0.2  |
|          | GEMO                        | <i>Geranium molle</i>                                | 25  | 0.2  | 0.2 | 0.2  |
|          | GAAP2                       | <i>Galium aparine</i>                                | 25  | 0.2  | 0.2 | 0.2  |
|          | ESCA2                       | <i>Eschscholzia californica</i>                      | 25  | 0.2  | 0.2 | 0.2  |
|          | EPCA3                       | <i>Epilobium canum</i>                               | 25  | 0.2  | 0.2 | 0.2  |
|          | CAPU18                      | <i>Calystegia purpurata</i>                          | 25  | 0.2  | 0.2 | 0.2  |
| AMTE3    | <i>Amsinckia tessellata</i> | 25   | 0.2 | 0.2  | 0.2 |      |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Lupinus albifrons* Association**

n = 4

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>         |             |   |            |            |            |            |
|                     | LOTUS       | <i>Lotus</i>  | 25         | 0.2        | 0.2        | 0.2        |
|                     | STGLG       | * <i>Streptanthus glandulosus</i> ssp. <i>glandulosus</i> | 25         | 0.2        | 0.2        | 0.2        |
|                     | TRMI4       | <i>Trifolium microcephalum</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                     | TROL2       | <i>Trifolium olivaceum</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                     | TRWI3       | <i>Trifolium willdenovii</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                     | SELAG       | <i>Selaginella</i>  | 25         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |   |            |            |            |            |
|                     | 2LICHN      | Lichen  | 25         | 2.0        | 2.0        | 2.0        |
|                     | 2MOSS       | Moss  | 25         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Frangula californica* – *Rhododendron occidentale* Provisional Alliance**  
**California coffee berry – western azalea patches**

Statewide (Sawyer et al. 2009<sup>1</sup>)

The two nominate species of the alliance were given separate alliance status in Sawyer et al. (2009). Recently the peer review panel of the NVC has suggested merging them into a single alliance; the new convention is followed here. *Frangula californica* or *Rhododendron occidentale* dominates or co-dominates in the shrub canopy with *Baccharis pilularis*, *Calycanthus occidentalis*, *Corylus cornuta*, *Ericameria pinifolia*, *Eriogonum wrightii*, *Frangula purshiana*, *Garrya veatchii*, *Hoita macrostachya*, *Malus fusca*, *Oemleria cerasiformis*, *Prunus virginiana*, *Ribes roezlii*, *Rubus parviflorus*, *Salix breweri*, *Sambucus nigra*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Abies grandis*, *Alnus rubra*, *Picea sitchensis*, *Pseudotsuga menziesii*, *Quercus agrifolia*, *Quercus chrysolepis*, or *Tsuga heterophylla*.

*Frangula californica* is a morphologically variable and widespread species. It has six subspecies, which have somewhat different ranges but similar ecologies. In coastal California, *Frangula californica* stands appear to be the result of a gradual transition from early-seral coastal scrub types (e.g., *Baccharis pilularis* Alliance) to a scrub type with little disturbance. These stands exist in a fine mosaic of grassland, shrubland, and woodland alliances. Ford and Hayes (2007) report *Frangula californica* stands on both north- and south-facing slopes along the coast from Big Sur to Point Reyes.

*Rhododendron occidentale* is a common shrub along streams, seeps, and moist slopes at low to montane elevations throughout most of cismontane California. The *Rhododendron occidentale* Alliance is also recognized for the Klamath Mountains in southwestern Oregon (Kagan et al. 2004).

Sonoma County

In Sonoma County, stands of the *Frangula californica* – *Rhododendron occidentale* Alliance are segregated into two distinct settings. The coastal stands dominated by *Frangula californica* ssp. *californica* are typically associated with *Baccharis pilularis*, *Rubus parviflorus*, and mesic herb species such as *Scrophularia californica* and *Heracleum maximum*, on mesic (but not wet) slopes within the zone of coastal summer fog.

Stands dominated or co-dominated by *Rhododendron occidentale* have been sampled in or adjacent to small streams or seeps near perched water tables of raised old marine terraces. These stands may have unique seep or riparian species such as *Aquilegia eximia* and *Veratrum fimbriatum* associated with them.

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**Local Alliance Summary (n = 7)**

**Elevation:** 418–1234 ft, mean 903 ft

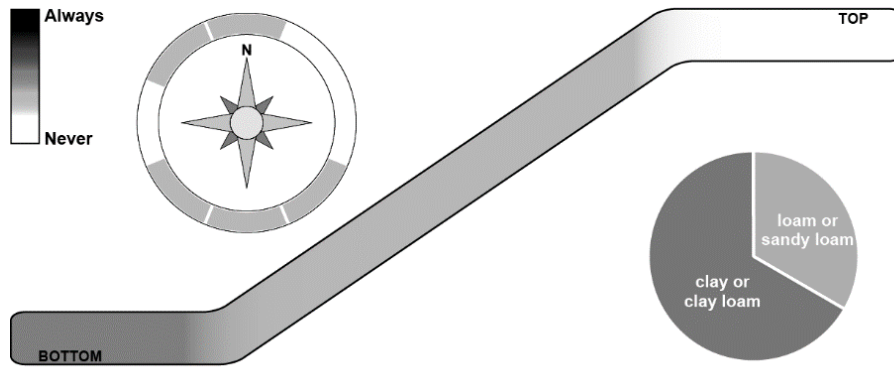
**SCV Global/State Rank:** G3/S3<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 48.9         | 10–85         | –          |
| <b>Herb</b>                          | 14.7         | 0–36          | <0.5–2     |
| <b>Shrub</b>                         | 42.3         | 8–70          | 1–5        |
| <b>Regenerating/understory tree*</b> | 1.1          | 0–5           | 1–5        |
| <b>Hardwood</b>                      | 0.7          | 0–5           | 5–10       |
| <b>Conifer</b>                       | 2.2          | 0–7           | 5–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 15.7° | 3–45° |
| <b>Large rock cover</b>  | 24.3% | 0–78% |
| <b>Small rock cover</b>  | 19.5% | 0–63% |
| <b>Bare ground cover</b> | 11.1% | 4–23% |
| <b>Litter cover</b>      | 37.9% | 1–85% |

**Associations within this Alliance:**

- Frangula californica* ssp. *californica* Provisional Association
- Rhododendron occidentale* – *Frangula californica* ssp. *tomentella* Provisional Association

**STAND TABLE**

***Frangula californica* – *Rhododendron occidentale* Provisional Alliance**

n = 7

| Lifeform                               | Code   | Botanical Name                    | Con | Avg | Min | Max |
|--|--------|-----------------------------------|-----|-----|-----|-----|
| <b>Tree</b>                            |        |                                   |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 43  | 4.7 | 2.0 | 6.0 |
|  | UMCA   | * <i>Umbellularia californica</i> | 29  | 2.1 | 0.2 | 4.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 29  | 0.6 | 0.2 | 1.0 |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |     |     |     |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 57  | 1.5 | 0.2 | 5.0 |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 29  | 0.7 | 0.4 | 1.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Frangula californica* – *Rhododendron occidentale* Provisional Alliance**

n = 7

| Lifeform                               | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|--|--------|--|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |        |  |     |      |     |      |
|  | UMCA   | * <i>Umbellularia californica</i>                    | 29  | 0.6  | 0.2 | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |     |      |
|  | RHOC   | <i>Rhododendron occidentale</i>                      | 86  | 24.2 | 4.0 | 50.0 |
|  | FRCAT2 | * <i>Frangula californica</i> ssp. <i>tomentella</i> | 57  | 11.5 | 3.0 | 20.0 |
|  | FRCA12 | * <i>Frangula californica</i>                        | 43  | 9.5  | 0.2 | 28.0 |
|  | QUUDU4 | <i>Quercus durata</i>                                | 43  | 4.4  | 0.2 | 12.0 |
|  | SABR2  | <i>Salix breweri</i>                                 | 43  | 2.7  | 1.0 | 5.0  |
|  | RUUR   | <i>Rubus ursinus</i>                                 | 29  | 6.5  | 2.0 | 11.0 |
|  | CAOC5  | <i>Calycanthus occidentalis</i>                      | 29  | 2.1  | 0.2 | 4.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                    | 29  | 1.6  | 0.2 | 3.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                       | 29  | 1.1  | 0.2 | 2.0  |
| <b>Herb</b>                            |        |  |     |      |     |      |
|  | CAME5  | <i>Carex mendocinensis</i>                           | 57  | 7.1  | 0.2 | 26.0 |
|  | AQEX   | <i>Aquilegia eximia</i>                              | 57  | 0.9  | 0.2 | 2.0  |
|  | EPGI   | <i>Epipactis gigantea</i>                            | 57  | 0.6  | 0.2 | 1.0  |
|  | IRMA   | <i>Iris macrosiphon</i>                              | 43  | 0.7  | 0.2 | 1.0  |
|  | MARA7  | <i>Maianthemum racemosum</i>                         | 43  | 0.2  | 0.2 | 0.2  |
|  | POCA5  | <i>Polygala californica</i>                          | 43  | 0.2  | 0.2 | 0.2  |
|  | POMU   | <i>Polystichum munitum</i>                           | 29  | 4.5  | 1.0 | 8.0  |
|  | PAPA8  | <i>Parnassia palustris</i>                           | 29  | 1.1  | 0.2 | 2.0  |
|  | METO   | <i>Melica torreyana</i>                              | 29  | 0.6  | 0.2 | 1.0  |
|  | CYCA4  | <i>Cypripedium californicum</i>                      | 29  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |     |      |
|  | 2MOSS  | Moss   | 43  | 6.0  | 1.0 | 15.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Frangula californica* ssp. *californica* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 65            | –          |
| <b>Herb</b>                          | 13.0         | 13            | 0.5–1      |
| <b>Shrub</b>                         | 58.0         | 58            | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** NE (1)  
**Macrotopography:** middle to upper 1/3 of slope (1)  
**Microtopography:** undulating (1)  
**Parent material:** metasedimentary (1)  
**Soil texture:** clay or clay loam (1)  
**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 418 ft. | 418 ft. |
| <b>Slope</b>             | 18.0°   | 18°     |
| <b>Large rock cover</b>  | 0.0%    | 0%      |
| <b>Small rock cover</b>  | 2.2%    | 2.2%    |
| <b>Bare ground cover</b> | 10.0%   | 10%     |
| <b>Litter cover</b>      | 85.0%   | 85%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0442  
**Relevés:** none

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Frangula californica* ssp. *californica* Provisional Association**

n = 1

| Lifeform                               | Code   | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | PSME   | <i>Pseudotsuga menziesii</i>                       | 100 | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | FRCA12 | <i>Frangula californica</i>                        | 100 | 28.0 | 28.0 | 28.0 |
|  | SYAL   | <i>Symphoricarpos albus</i>                        | 100 | 15.0 | 15.0 | 15.0 |
|  | RUUR   | <i>Rubus ursinus</i>                               | 100 | 11.0 | 11.0 | 11.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                         | 100 | 8.0  | 8.0  | 8.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                  | 100 | 3.0  | 3.0  | 3.0  |
|  | RISA   | <i>Ribes sanguineum</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|  | LOINL  | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 100 | 0.2  | 0.2  | 0.2  |
|  | RUPA   | <i>Rubus parviflorus</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|  | SARAR3 | <i>Sambucus racemosa</i> var. <i>racemosa</i>      | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | HEMA80 | <i>Heracleum maximum</i>                           | 100 | 10.0 | 10.0 | 10.0 |
|  | POMU   | <i>Polystichum munitum</i>                         | 100 | 8.0  | 8.0  | 8.0  |
|  | STACH  | <i>Stachys</i>                                     | 100 | 5.0  | 5.0  | 5.0  |
|  | GANU   | <i>Galium nuttallii</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|  | MAST4  | <i>Maianthemum stellatum</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>   | 100 | 0.2  | 0.2  | 0.2  |
|  | SCCA2  | <i>Scrophularia californica</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|  | FRAGA  | <i>Fragaria</i>                                    | 100 | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Rhododendron occidentale* – *Frangula californica* ssp. *tomentella*  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 44.4         | 10–85         | –          |
| Herb                          | 15.0         | 0–36          | <0.5–1     |
| Shrub                         | 38.6         | 8–70          | 1–5        |
| Regenerating/understory tree* | 0.4          | 0–1           | 1–5        |
| Hardwood                      | 1.0          | 0–5           | 5–10       |
| Conifer                       | 3.0          | 0–7           | 5–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (3), SW (1)

**Macrotopography:** bottom (2), lower 1/3 of slope (2), upper 1/3 of slope (1)

**Microtopography:** concave (4), undulating (1)

**Parent material:** serpentine (4), ultramafic (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2), steep/>25° (1)

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 985 ft. | 663–1234 ft. |
| Slope             | 18.3°   | 5–45°        |
| Large rock cover  | 34.0%   | 3–78%        |
| Small rock cover  | 26.8%   | 2–63%        |
| Bare ground cover | 9.0%    | 4–20%        |
| Litter cover      | 23.0%   | 1–85%        |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO0269, SONO0287, SONO0309, SONO2215, SONO2218

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

**STAND TABLE**

***Rhododendron occidentale* – *Frangula californica* ssp. *tomentella* Provisional Association**

n = 5

| Lifeform | Code   | Botanical Name                    | Con | Avg | Min | Max |
|----------|--------|-----------------------------------|-----|-----|-----|-----|
| Tree     | HESA17 | * <i>Hesperocypris sargentii</i>  | 60  | 4.7 | 2.0 | 6.0 |
|          | UMCA   | * <i>Umbellularia californica</i> | 40  | 2.1 | 0.2 | 4.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Rhododendron occidentale* – *Frangula californica* ssp. *tomentella* Provisional Association**

n = 5

| Lifeform                               | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                       | 40  | 0.6  | 0.2  | 1.0  |
|  | ARME   | <i>Arbutus menziesii</i>                             | 20  | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                    | 40  | 0.7  | 0.4  | 1.0  |
|  | UMCA   | * <i>Umbellularia californica</i>                    | 40  | 0.6  | 0.2  | 1.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                       | 40  | 0.3  | 0.2  | 0.4  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | RHOC   | <i>Rhododendron occidentale</i>                      | 100 | 22.0 | 4.0  | 50.0 |
|  | FRCAT2 | * <i>Frangula californica</i> ssp. <i>tomentella</i> | 80  | 11.5 | 3.0  | 20.0 |
|  | QUDU4  | <i>Quercus durata</i>                                | 60  | 4.4  | 0.2  | 12.0 |
|  | SABR2  | <i>Salix breweri</i>                                 | 60  | 2.7  | 1.0  | 5.0  |
|  | CAOC5  | <i>Calycanthus occidentalis</i>                      | 40  | 2.1  | 0.2  | 4.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                       | 40  | 1.1  | 0.2  | 2.0  |
|  | CAOC   | <i>Cardamine occidentalis</i>                        | 20  | 18.0 | 18.0 | 18.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                    | 20  | 0.2  | 0.2  | 0.2  |
|  | HOLOD  | <i>Holodiscus</i>                                    | 20  | 0.2  | 0.2  | 0.2  |
|  | FRCA12 | * <i>Frangula californica</i>                        | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | CAME5  | <i>Carex mendocinensis</i>                           | 80  | 7.1  | 0.2  | 26.0 |
|  | AQEX   | <i>Aquilegia eximia</i>                              | 80  | 0.9  | 0.2  | 2.0  |
|  | EPGI   | <i>Epipactis gigantea</i>                            | 80  | 0.6  | 0.2  | 1.0  |
|  | IRMA   | <i>Iris macrosiphon</i>                              | 60  | 0.7  | 0.2  | 1.0  |
|  | POCA5  | <i>Polygala californica</i>                          | 60  | 0.2  | 0.2  | 0.2  |
|  | MARA7  | <i>Maianthemum racemosum</i>                         | 60  | 0.2  | 0.2  | 0.2  |
|  | PAPA8  | <i>Parnassia palustris</i>                           | 40  | 1.1  | 0.2  | 2.0  |
|  | METO   | <i>Melica torreyana</i>                              | 40  | 0.6  | 0.2  | 1.0  |
|  | CYCA4  | <i>Cypripedium californicum</i>                      | 40  | 0.2  | 0.2  | 0.2  |
|  | ADAL   | <i>Adiantum aleuticum</i>                            | 20  | 20.0 | 20.0 | 20.0 |
|  | MUAN   | <i>Muhlenbergia andina</i>                           | 20  | 3.0  | 3.0  | 3.0  |
|  | FECA   | <i>Festuca californica</i>                           | 20  | 1.0  | 1.0  | 1.0  |
|  | ADCA   | <i>Adiantum capillus-veneris</i>                     | 20  | 1.0  | 1.0  | 1.0  |
|  | CLGY2  | <i>Claytonia gypsophiloides</i>                      | 20  | 0.2  | 0.2  | 0.2  |
|  | PACA18 | <i>Parnassia californica</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|  | PETR7  | <i>Pentagramma triangularis</i>                      | 20  | 0.2  | 0.2  | 0.2  |
|  | ASDE6  | <i>Aspidotis densa</i>                               | 20  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |  |     |      |      |      |
|  | 2MOSS  | Moss   | 60  | 6.0  | 1.0  | 15.0 |
|  | 2ALGA  | Alga   | 20  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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## ***Gaultheria shallon* – *Rubus (ursinus)* Provisional Alliance** **Salal – California blackberry tangles**

### Statewide

The two nominate species of this alliance were segregated from the *Rubus* spp. Alliance in Sawyer et al. (2009) based on suggestions from the peer review panel of the NVC. The new convention is followed here: *Rubus ursinus* or *Gaultheria shallon* dominates solely or co-dominates, forming various mixtures in the shrub canopy with *Baccharis pilularis*, *Garrya elliptica*, *Gaultheria shallon*, *Heracleum maximum*, *Lonicera involucrata*, *Marah oreganus*, *Morella californica*, *Ribes menziesii*, *Sambucus racemosa*, *Toxicodendron diversilobum*, and *Vaccinium ovatum*. Emergent trees may be present at low cover, including *Picea sitchensis*, *Pinus muricata*, or *Pseudotsuga menziesii*.

Stands of *Rubus ursinus*, which were previously thought to be part of a mixed *Rubus* Alliance (Sawyer et al. 2009), have recently been reconsidered as two different alliances (*Morella californica* – *Rubus spectabilis* and *Gaultheria shallon* – *Rubus (ursinus)* Provisional Alliances). *Rubus ursinus* and *Gaultheria shallon* are both widespread, low, sprawling shrubs found in mesic woodlands and forests in the coastal areas of central and northern California. Both species tend to emerge from forest or woodland cover on exposed coastal bluffs or in coastal grasslands.

### Sonoma County

In Sonoma County two provisional associations have been defined from the plot data. The *Gaultheria shallon* – *Rubus* spp. Provisional Association is characterized by a mix of both species and tends to occur in areas with significant fog drip, such as around rock outcrops on bluffs or just outside the drip line of *Pinus muricata* stands near the coast. This association is often adjacent to and intermingled with stands of *Calamagrostis nutkaensis*. The *Rubus ursinus* Association is often found along old fencelines in coastal pastures or formerly grazed coastal grasslands classified within the *Holcus lanatus* – *Anthoxanthum odoratum* Alliance. The *Rubus ursinus* Association tends to have mixtures of grasses and graminoid species.

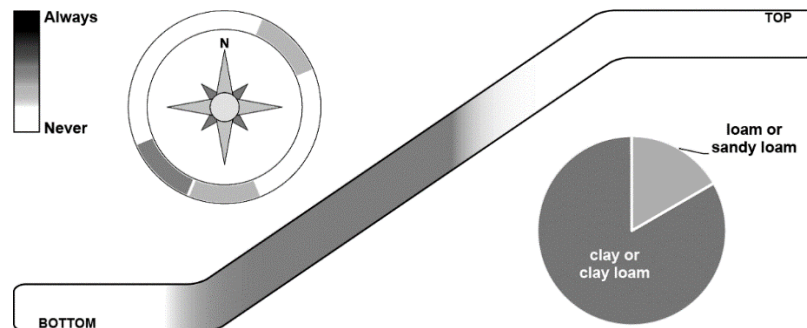
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### **Local Alliance Summary (n = 7)**

**Elevation:** 92–542 ft, mean 257 ft

**SCV Global/State Rank:** G4/S3<sup>1</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 63.0         | 42–100        | –          |
| <b>Herb</b>                          | 47.0         | 8–95          | 0.5–1      |
| <b>Shrub</b>                         | 36.3         | 15–70         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.4          | 0–3           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.1          | 0–1           | 1–2        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.0° | 2–54°  |
| <b>Large rock cover</b>  | 2.7%  | 0–19%  |
| <b>Small rock cover</b>  | 0.3%  | 0–1%   |
| <b>Bare ground cover</b> | 12.6% | 0–72%  |
| <b>Litter cover</b>      | 77.0% | 25–92% |

**Associations within this Alliance:**

*Gaultheria shallon* – *Rubus* spp. Provisional Association  
*Rubus ursinus* Association

**STAND TABLE**

***Gaultheria shallon* – *Rubus (ursinus)* Provisional Alliance**

n = 7

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> | RUUR   | <i>Rubus ursinus</i>                             | 86  | 30.8 | 6.0  | 65.0 |
|              | BAPI   | <i>Baccharis pilularis</i>                       | 57  | 2.8  | 0.2  | 5.0  |
|              | GASH   | <i>Gaultheria shallon</i>                        | 29  | 21.5 | 18.0 | 25.0 |
|              | TODI   | <i>Toxicodendron diversilobum</i>                | 29  | 8.5  | 7.0  | 10.0 |
|              | VAOV2  | <i>Vaccinium ovatum</i>                          | 29  | 1.1  | 0.2  | 2.0  |
| <b>Herb</b>  | PLLA   | <i>Plantago lanceolata</i>                       | 71  | 0.2  | 0.2  | 0.2  |
|              | HOLA   | <i>Holcus lanatus</i>                            | 57  | 24.8 | 3.0  | 38.0 |
|              | RUAC3  | <i>Rumex acetosella</i>                          | 57  | 1.6  | 0.2  | 3.0  |
|              | LIBI5  | <i>Linum bienne</i>                              | 57  | 0.7  | 0.2  | 2.0  |
|              | VUBR   | <i>Vulpia bromoides</i>                          | 43  | 7.7  | 0.2  | 15.0 |
|              | IRDO   | <i>Iris douglasiana</i>                          | 43  | 3.0  | 3.0  | 3.0  |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 43  | 2.1  | 0.2  | 5.0  |
|              | HYRA3  | <i>Hypochaeris radicata</i>                      | 43  | 0.2  | 0.2  | 0.2  |
|              | BRMA   | <i>Briza maxima</i>                              | 29  | 19.5 | 1.0  | 38.0 |
|              | ANOD   | <i>Anthoxanthum odoratum</i>                     | 29  | 19.1 | 0.2  | 38.0 |
|              | BRDI3  | <i>Bromus diandrus</i>                           | 29  | 14.0 | 8.0  | 20.0 |
|              | LETA   | <i>Leontodon taraxacoides</i>                    | 29  | 9.1  | 0.2  | 18.0 |
|              | CANU   | <i>Calamagrostis nutkaensis</i>                  | 29  | 6.1  | 0.2  | 12.0 |
|              | AVBA   | <i>Avena barbata</i>                             | 29  | 3.5  | 3.0  | 4.0  |
|              | BRCA5  | <i>Bromus carinatus</i>                          | 29  | 2.0  | 1.0  | 3.0  |
|              | ELGL   | <i>Elymus glaucus</i>                            | 29  | 1.6  | 0.2  | 3.0  |
|              | CAREX  | <i>Carex</i>                                     | 29  | 1.1  | 0.2  | 2.0  |
|              | AICA   | <i>Aira caryophylla</i>                          | 29  | 0.2  | 0.2  | 0.2  |

**STAND TABLE** continued

***Gaultheria shallon* – *Rubus (ursinus)* Provisional Alliance**

n = 7

| Lifeform | Code  | Botanical Name             | Con | Avg | Min | Max |
|----------|-------|----------------------------|-----|-----|-----|-----|
| Herb     |       |                            |     |     |     |     |
|          | CIVU  | <i>Cirsium vulgare</i>     | 29  | 0.2 | 0.2 | 0.2 |
|          | GEDI  | <i>Geranium dissectum</i>  | 29  | 0.2 | 0.2 | 0.2 |
|          | LOFO2 | <i>Lotus formosissimus</i> | 29  | 0.2 | 0.2 | 0.2 |
|          | NAMA7 | <i>Nassella manicata</i>   | 29  | 0.2 | 0.2 | 0.2 |

***Gaultheria shallon* – *Rubus* spp. Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 43.5         | 42–45         | –          |
| Herb                          | 12.0         | 8–16          | 0.5–1      |
| Shrub                         | 37.0         | 36–38         | 1–5        |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.5          | 0–1           | 1–2        |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SW (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1)

**Microtopography:** concave (1), convex (1)

**Parent material:** Franciscan melange (1), sedimentary (1)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** steep/>25° (2)

|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 327 ft. | 210–443 ft. |
| Slope             | 54.0°   | 54°         |
| Large rock cover  | 9.5%    | 0–19%       |
| Small rock cover  | 0.1%    | 0–0.2%      |
| Bare ground cover | 4.5%    | 2–7%        |
| Litter cover      | 83.0%   | 76–90%      |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0444

**Relevés:** SONO0039

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Gaultheria shallon* – *Rubus* spp. Provisional Association**

n = 2

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Tree     | PIMU   | <i>Pinus muricata</i>                            | 50  | 1.0  | 1.0  | 1.0  |
|          | PSME   | <i>Pseudotsuga menziesii</i>                     | 50  | 0.2  | 0.2  | 0.2  |
| Shrub    | GASH   | <i>Gaultheria shallon</i>                        | 100 | 21.5 | 18.0 | 25.0 |
|          | VAOV2  | <i>Vaccinium ovatum</i>                          | 100 | 1.1  | 0.2  | 2.0  |
|          | RUPA   | <i>Rubus parviflorus</i>                         | 50  | 16.0 | 16.0 | 16.0 |
|          | TODI   | <i>Toxicodendron diversilobum</i>                | 50  | 10.0 | 10.0 | 10.0 |
|          | RUUR   | <i>Rubus ursinus</i>                             | 50  | 6.0  | 6.0  | 6.0  |
|          | BAPI   | <i>Baccharis pilularis</i>                       | 50  | 3.0  | 3.0  | 3.0  |
|          | MOCA6  | <i>Morella californica</i>                       | 50  | 2.0  | 2.0  | 2.0  |
|          | FRCA12 | <i>Frangula californica</i>                      | 50  | 1.0  | 1.0  | 1.0  |
|          | LUAR   | <i>Lupinus arboreus</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|          | VIAMA3 | <i>Vicia americana</i> ssp. <i>americana</i>     | 50  | 0.2  | 0.2  | 0.2  |
| Herb     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 0.6  | 0.2  | 1.0  |
|          | CANU   | <i>Calamagrostis nutkaensis</i>                  | 50  | 12.0 | 12.0 | 12.0 |
|          | POLYS  | <i>Polystichum</i>                               | 50  | 8.0  | 8.0  | 8.0  |
|          | POMU   | <i>Polystichum munitum</i>                       | 50  | 2.0  | 2.0  | 2.0  |
|          | CYDA   | <i>Cynodon dactylon</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|          | WISE3  | <i>Viola sempervirens</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|          | VAPL   | <i>Vancouveria planipetala</i>                   | 50  | 0.2  | 0.2  | 0.2  |
|          | POCA26 | <i>Polypodium calirhiza</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | PETR7  | <i>Pentagramma triangularis</i>                  | 50  | 0.2  | 0.2  | 0.2  |
|          | MAIAN  | <i>Maianthemum</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|          | ERST9  | <i>Eriophyllum stoechadifolium</i>               | 50  | 0.2  | 0.2  | 0.2  |
|          | CLPE   | <i>Claytonia perfoliata</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | CAAF2  | <i>Castilleja affinis</i> ssp. <i>affinis</i>    | 50  | 0.2  | 0.2  | 0.2  |
|          | CACA39 | <i>Cardamine californica</i>                     | 50  | 0.2  | 0.2  | 0.2  |
|          | ARDO3  | <i>Artemisia douglasiana</i>                     | 50  | 0.2  | 0.2  | 0.2  |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | HEMA80 | <i>Heracleum maximum</i>                         | 50  | 0.2  | 0.2  | 0.2  |

***Rubus ursinus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 82.5         | 65–100        | –          |
| <b>Herb</b>                          | 61.0         | 30–95         | 0.5–1      |
| <b>Shrub</b>                         | 36.0         | 15–70         | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.6          | 0–3           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data**

**Aspect:** NE (1), SE (1), SW (3)

**Macrotopography:** lower 1/3 of slope (2), middle 1/3 of slope (3)

**Microtopography:** concave (1), convex (1), flat (3)

**Parent material:** metasedimentary (1), sandstone (1), sedimentary (3)

**Soil texture:** clay or clay loam (3), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (2)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 229 ft. | 92–542 ft. |
| <b>Slope</b>             | 8.4°    | 2–20°      |
| <b>Large rock cover</b>  | 0.0%    | 0–0%       |
| <b>Small rock cover</b>  | 0.4%    | 0–1%       |
| <b>Bare ground cover</b> | 15.8%   | 0–72%      |
| <b>Litter cover</b>      | 74.6%   | 25–92%     |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** SONO2210

**Relevés:** HEAD0098, HEAD0102, HEAD0300, SONO0228

**SCV Global/State Rank:** G4?/S4?¹

**STAND TABLE**

***Rubus ursinus* Association**

n = 5

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PRUNU  | <i>Prunus</i>                                       | 20  | 3.0  | 3.0  | 3.0  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 20  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | RUUR   | <i>Rubus ursinus</i>                                | 100 | 35.8 | 18.0 | 65.0 |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 60  | 2.7  | 0.2  | 5.0  |
|  | CYSC4  | <i>Cytisus scoparius</i>                            | 20  | 15.0 | 15.0 | 15.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 20  | 7.0  | 7.0  | 7.0  |
|  | COTON  | <i>Cotoneaster</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|  | FRCAC5 | <i>Frangula californica</i> ssp. <i>californica</i> | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | PLLA   | <i>Plantago lanceolata</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|  | HOLA   | <i>Holcus lanatus</i>                               | 80  | 24.8 | 3.0  | 38.0 |
|  | RUAC3  | <i>Rumex acetosella</i>                             | 80  | 1.6  | 0.2  | 3.0  |
|  | LIBI5  | <i>Linum bienne</i>                                 | 80  | 0.7  | 0.2  | 2.0  |
|  | VUBR   | <i>Vulpia bromoides</i>                             | 60  | 7.7  | 0.2  | 15.0 |
|  | IRDO   | <i>Iris douglasiana</i>                             | 60  | 3.0  | 3.0  | 3.0  |
|  | HYRA3  | <i>Hypochaeris radicata</i>                         | 60  | 0.2  | 0.2  | 0.2  |
|  | BRMA   | <i>Briza maxima</i>                                 | 40  | 19.5 | 1.0  | 38.0 |
|  | ANOD   | <i>Anthoxanthum odoratum</i>                        | 40  | 19.1 | 0.2  | 38.0 |
|  | BRDI3  | <i>Bromus diandrus</i>                              | 40  | 14.0 | 8.0  | 20.0 |
|  | LETA   | <i>Leontodon taraxacoides</i>                       | 40  | 9.1  | 0.2  | 18.0 |
|  | AVBA   | <i>Avena barbata</i>                                | 40  | 3.5  | 3.0  | 4.0  |
|  | BRCA5  | <i>Bromus carinatus</i>                             | 40  | 2.0  | 1.0  | 3.0  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Rubus ursinus* Association**

n = 5

| Lifeform<br>Herb | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|------------------|--------|--|-----|------|------|------|
|                  | ELGL   | <i>Elymus glaucus</i>                                | 40  | 1.6  | 0.2  | 3.0  |
|                  | CAREX  | <i>Carex</i>   | 40  | 1.1  | 0.2  | 2.0  |
|                  | NAMA7  | <i>Nassella manicata</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|                  | AICA   | <i>Aira caryophyllea</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|                  | GEDI   | <i>Geranium dissectum</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|                  | CIVU   | <i>Cirsium vulgare</i>                               | 40  | 0.2  | 0.2  | 0.2  |
|                  | LOFO2  | <i>Lotus formosissimus</i>                           | 40  | 0.2  | 0.2  | 0.2  |
|                  | DECE   | <i>Deschampsia cespitosa</i>                         | 20  | 68.0 | 68.0 | 68.0 |
|                  | ACNO7  | <i>Acaena novae-zelandiae</i>                        | 20  | 38.0 | 38.0 | 38.0 |
|                  | 2DAPI  | <i>Danthonia pilosa</i>                              | 20  | 18.0 | 18.0 | 18.0 |
|                  | VITE   | <i>Vicia tetrasperma</i>                             | 20  | 8.0  | 8.0  | 8.0  |
|                  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>     | 20  | 5.0  | 5.0  | 5.0  |
|                  | CAPU18 | <i>Calystegia purpurata</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|                  | NALE2  | <i>Nassella lepida</i>                               | 20  | 3.0  | 3.0  | 3.0  |
|                  | CAPY2  | <i>Carduus pycnocephalus</i>                         | 20  | 3.0  | 3.0  | 3.0  |
|                  | CAGY3  | <i>Carex gynodynamis</i>                             | 20  | 3.0  | 3.0  | 3.0  |
|                  | JUPH   | <i>Juncus phaeocephalus</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|                  | JUAR2  | <i>Juncus arcticus</i>                               | 20  | 2.0  | 2.0  | 2.0  |
|                  | STRI   | * <i>Stachys rigida</i>                              | 20  | 1.0  | 1.0  | 1.0  |
|                  | CYEC   | <i>Cynosurus echinatus</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|                  | RUPU3  | <i>Rumex pulcher</i>                                 | 20  | 0.2  | 0.2  | 0.2  |
|                  | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>          | 20  | 0.2  | 0.2  | 0.2  |
|                  | PRVUL2 | <i>Prunella vulgaris</i> ssp. <i>lanceolata</i>      | 20  | 0.2  | 0.2  | 0.2  |
|                  | PLER3  | <i>Plantago erecta</i>                               | 20  | 0.2  | 0.2  | 0.2  |
|                  | RACA2  | <i>Ranunculus californicus</i>                       | 20  | 0.2  | 0.2  | 0.2  |
|                  | PANIC  | <i>Panicum</i>                                       | 20  | 0.2  | 0.2  | 0.2  |
|                  | MYDI   | <i>Myosotis discolor</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|                  | MASA   | <i>Madia sativa</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|                  | LUVE   | <i>Lupinus versicolor</i>                            | 20  | 0.2  | 0.2  | 0.2  |
|                  | LOUNU  | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> | 20  | 0.2  | 0.2  | 0.2  |
|                  | CIAR4  | <i>Cirsium arvense</i>                               | 20  | 0.2  | 0.2  | 0.2  |
|                  | JUPA2  | <i>Juncus patens</i>                                 | 20  | 0.2  | 0.2  | 0.2  |
|                  | STRIR3 | * <i>Stachys rigida</i> var. <i>rigida</i>           | 20  | 0.2  | 0.2  | 0.2  |
|                  | GAPU3  | <i>Gamochaeta purpurea</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|                  | FRCH   | <i>Fragaria chiloensis</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|                  | ERAR12 | <i>Eryngium armatum</i>                              | 20  | 0.2  | 0.2  | 0.2  |
|                  | VISA   | <i>Vicia sativa</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|                  | LOPE   | <i>Lolium perenne</i>                                | 20  | 0.2  | 0.2  | 0.2  |
|                  | VICIA  | <i>Vicia</i>   | 20  | 0.2  | 0.2  | 0.2  |
|                  | DIDO3  | <i>Dichondra donnelliana</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|                  | AIPR   | <i>Aira praecox</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|                  | ANAR   | <i>Anagallis arvensis</i>                            | 20  | 0.2  | 0.2  | 0.2  |
|                  | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 20  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Rubus ursinus* Association**

n = 5

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                 |            |            |            |            |
|                 | TRISE       | <i>Trisetum</i>                 | 20         | 0.2        | 0.2        | 0.2        |
|                 | CANU        | <i>Calamagrostis nutkaensis</i> | 20         | 0.2        | 0.2        | 0.2        |
|                 | COAR4       | <i>Convolvulus arvensis</i>     | 20         | 0.2        | 0.2        | 0.2        |
|                 | DACA3       | <i>Danthonia californica</i>    | 20         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>              | 20         | 0.2        | 0.2        | 0.2        |
|                 | ERGL11      | <i>Erechtites glomeratus</i>    | 20         | 0.1        | 0.1        | 0.1        |
|                 | BRASS2      | <i>Brassica</i>                 | 20         | 0.1        | 0.1        | 0.1        |

## ***Lupinus arboreus* Alliance and Semi-Natural Alliance**

### **Yellow bush lupine scrub**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Lupinus arboreus* is dominant or co-dominant in the shrub canopy with *Ammophila arenaria*, *Baccharis pilularis*, *Ericameria ericoides*, and *Lupinus chamissonis*. Emergent trees or tall shrubs may be present at low cover, including *Alnus rubra* or *Morella californica*.

Stands of *Lupinus arboreus* occur natively in southern and central California from Ventura to Sonoma Counties. They have become widely naturalized in northern California along the coast from Mendocino and Humboldt Counties to Vancouver, Canada. However, demarcation between native and naturalized populations is still disputed (Pickart 2000). Native stands often occupy stabilized dunes, coastal bluffs, and disturbed areas (e.g., pastures) near the coast, and they appear to have a short temporal nature (Keeler-Wolf et al. 2003a, Ross 2002b). North of Sonoma County, *Lupinus arboreus* is an invasive shrub on dune systems and disturbed coastal areas, where it has been widely planted as a sand stabilizer and ornamental (Pickart and Sawyer 1998).

Dune scrub, which includes stands of the native *Lupinus arboreus*, is characteristic of backdunes along the coast south of Bodega Head in Sonoma County. Dune mat, a collection of annuals and perennials of the *Abronia latifolia* – *Ambrosia chamissonis* and *Festuca rubra* Alliances, exists on the northern California coast (Pickart and Barbour 2007) where it covers nearshore dune ridges. Dune mat is now rare. *Lupinus arboreus* aggressively invades dune mat and modifies environmental conditions to facilitate the invasion of non-native annual grasses, other weeds, and long-lived natives that replaces the dune mat (Pickart 2000, Pickart and Sawyer 1998, Ross2002b).

#### Sonoma County

All *Lupinus arboreus* stands sampled in the county occur on terraces, bluffs, or stabilized dunes within 1 km of the coast. These stands tend to have an understory dominated by non-native grasses such as *Bromus diandrus*, which presumably benefit from the nitrogenous build up beneath these nitrogen-fixing shrubs. *Lupinus arboreus* stands commonly occur adjacent to *Baccharis pilularis* shrubland, and native and non-native perennial coastal grasslands.

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#### **Local Alliance Summary (n = 10)**

**Elevation:** 22–265 ft, mean 102 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

#### **Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

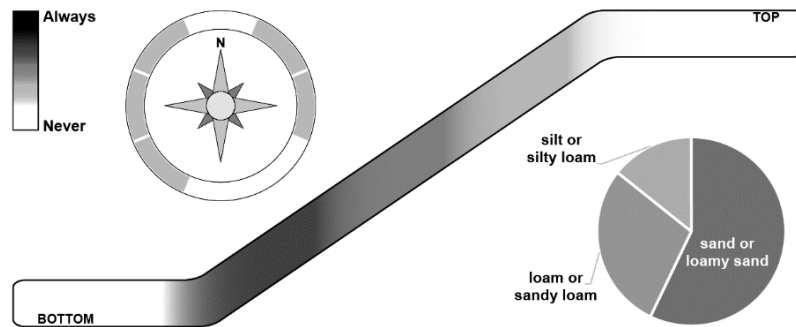
NatureServe global/state rank: G4T2T3/S2S3

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.9         | 32–90         | –          |
| <b>Herb</b>                          | 32.0         | 10–75         | <0.5–0.5   |
| <b>Shrub</b>                         | 26.3         | 5–51          | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 8.0°  | 1–30° |
| <b>Large rock cover</b>  | 1.2%  | 0–10% |
| <b>Small rock cover</b>  | 4.9%  | 0–33% |
| <b>Bare ground cover</b> | 23.0% | 0–88% |
| <b>Litter cover</b>      | 67.2% | 6–96% |

**Associations within this Alliance:**

*Lupinus arboreus* Association

**STAND TABLE**

***Lupinus arboreus* Alliance and Semi-Natural Alliance**

n = 10

| Lifeform     | Code   | Botanical Name               | Con | Avg  | Min  | Max  |
|--------------|--------|------------------------------|-----|------|------|------|
| <b>Shrub</b> | LUAR   | <i>Lupinus arboreus</i>      | 100 | 29.5 | 6.0  | 88.0 |
|              | BAPI   | <i>Baccharis pilularis</i>   | 60  | 2.5  | 0.2  | 8.0  |
|              | RUUR   | <i>Rubus ursinus</i>         | 40  | 5.5  | 2.0  | 8.0  |
| <b>Herb</b>  | HOLA   | <i>Holcus lanatus</i>        | 70  | 13.7 | 0.2  | 38.0 |
|              | RUAC3  | <i>Rumex acetosella</i>      | 60  | 4.2  | 0.2  | 14.0 |
|              | VUBR   | <i>Vulpia bromoides</i>      | 40  | 5.6  | 0.2  | 19.0 |
|              | ACMI2  | <i>Achillea millefolium</i>  | 40  | 0.7  | 0.2  | 2.0  |
|              | IRDO   | <i>Iris douglasiana</i>      | 30  | 0.5  | 0.2  | 1.0  |
|              | BRDI3  | <i>Bromus diandrus</i>       | 20  | 25.0 | 12.0 | 38.0 |
|              | CAPY2  | <i>Carduus pycnocephalus</i> | 20  | 19.1 | 0.2  | 38.0 |
|              | HEMA80 | <i>Heracleum maximum</i>     | 20  | 6.1  | 0.1  | 12.0 |



**STAND TABLE** continued

***Lupinus arboreus* Alliance and Semi-Natural Alliance**

n = 10

| Lifeform | Code   | Botanical Name                                   | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Herb     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 20  | 6.0 | 4.0 | 8.0 |
|          | RAPHA  | <i>Raphanus</i>                                  | 20  | 5.0 | 1.0 | 9.0 |
|          | AMAR4  | <i>Ammophila arenaria</i>                        | 20  | 4.0 | 1.0 | 7.0 |
|          | LOPE   | <i>Lolium perenne</i>                            | 20  | 3.5 | 3.0 | 4.0 |
|          | BRMA   | <i>Briza maxima</i>                              | 20  | 2.5 | 1.0 | 4.0 |
|          | GAAP2  | <i>Galium aparine</i>                            | 20  | 1.1 | 0.2 | 2.0 |
|          | LETA   | <i>Leontodon taraxacoides</i>                    | 20  | 1.1 | 0.2 | 2.0 |
|          | ANOD   | <i>Anthoxanthum odoratum</i>                     | 20  | 0.6 | 0.2 | 1.0 |
|          | LOTUS  | <i>Lotus</i>                                     | 20  | 0.6 | 0.2 | 1.0 |
|          | SOAS   | <i>Sonchus asper</i>                             | 20  | 0.6 | 0.2 | 1.0 |
|          | ERGL3  | <i>Erigeron glaucus</i>                          | 20  | 0.6 | 0.1 | 1.0 |
|          | AREG   | <i>Argentina egedii</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|          | AVBA   | <i>Avena barbata</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|          | ESCA2  | <i>Eschscholzia californica</i>                  | 20  | 0.2 | 0.2 | 0.2 |
|          | AICA   | <i>Aira caryophylla</i>                          | 20  | 0.2 | 0.1 | 0.2 |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Lupinus arboreus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) and Coastal Hills-Santa Rosa Plain/263Aj (5) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.9         | 32–90         | –          |
| <b>Herb</b>                          | 32.0         | 10–75         | <0.5–0.5   |
| <b>Shrub</b>                         | 26.3         | 5–51          | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), NW (3), SW (4)

**Macrotopography:** lower 1/3 of slope (6), lower to upper 1/3 of slope (2), middle 1/3 of slope (2)

**Microtopography:** concave (1), convex (1), flat (4), undulating (4)

**Parent material:** Franciscan melange (2), igneous (2), sand dunes (2), sedimentary (4)

**Soil texture:** loam or sandy loam (2), sand (4), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (5), moderate/6-25° (4), steep/>25° (1)

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|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 102 ft. | 22–265 ft. |
| Slope             | 8.0°    | 1–30°      |
| Large rock cover  | 1.2%    | 0–10%      |
| Small rock cover  | 4.9%    | 0–33%      |
| Bare ground cover | 23.0%   | 0–88%      |
| Litter cover      | 67.2%   | 6–96%      |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** SONO0007, SONO0026, SONO0084, SONO0102, SONO0449, SONO0452, SONO0735, SONO2187

**Relevés:** HEAD0119, SONO0106

**SCV Global/State Rank:** G3G4?/S3S4?¹

**STAND TABLE**

***Lupinus arboreus* Association**

n = 10

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | LUAR   | <i>Lupinus arboreus</i>                          | 100 | 29.5 | 6.0  | 88.0 |
|          | BAPI   | <i>Baccharis pilularis</i>                       | 60  | 2.5  | 0.2  | 8.0  |
|          | RUUR   | <i>Rubus ursinus</i>                             | 40  | 5.5  | 2.0  | 8.0  |
| Herb     | HOLA   | <i>Holcus lanatus</i>                            | 70  | 13.7 | 0.2  | 38.0 |
|          | RUAC3  | <i>Rumex acetosella</i>                          | 60  | 4.2  | 0.2  | 14.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 40  | 5.6  | 0.2  | 19.0 |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 40  | 0.7  | 0.2  | 2.0  |
|          | IRDO   | <i>Iris douglasiana</i>                          | 30  | 0.5  | 0.2  | 1.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 20  | 25.0 | 12.0 | 38.0 |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                     | 20  | 19.1 | 0.2  | 38.0 |
|          | HEMA80 | <i>Heracleum maximum</i>                         | 20  | 6.1  | 0.1  | 12.0 |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 20  | 6.0  | 4.0  | 8.0  |
|          | RAPHA  | <i>Raphanus</i>                                  | 20  | 5.0  | 1.0  | 9.0  |
|          | AMAR4  | <i>Ammophila arenaria</i>                        | 20  | 4.0  | 1.0  | 7.0  |
|          | LOPE   | <i>Lolium perenne</i>                            | 20  | 3.5  | 3.0  | 4.0  |
|          | BRMA   | <i>Briza maxima</i>                              | 20  | 2.5  | 1.0  | 4.0  |
|          | GAAP2  | <i>Galium aparine</i>                            | 20  | 1.1  | 0.2  | 2.0  |
|          | LETA   | <i>Leontodon taraxacoides</i>                    | 20  | 1.1  | 0.2  | 2.0  |
|          | ANOD   | <i>Anthoxanthum odoratum</i>                     | 20  | 0.6  | 0.2  | 1.0  |
|          | LOTUS  | <i>Lotus</i>                                     | 20  | 0.6  | 0.2  | 1.0  |
|          | SOAS   | <i>Sonchus asper</i>                             | 20  | 0.6  | 0.2  | 1.0  |
|          | ERGL3  | <i>Erigeron glaucus</i>                          | 20  | 0.6  | 0.1  | 1.0  |
|          | AREG   | <i>Argentina egedii</i>                          | 20  | 0.2  | 0.2  | 0.2  |
|          | AVBA   | <i>Avena barbata</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|          | ESCA2  | <i>Eschscholzia californica</i>                  | 20  | 0.2  | 0.2  | 0.2  |
|          | AICA   | <i>Aira caryophyllea</i>                         | 20  | 0.2  | 0.1  | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Lupinus chamissonis* – *Ericameria ericoides* Alliance**  
**Silver dune lupine – mock heather scrub**

Statewide (Sawyer et al. 2009)

*Ericameria ericoides* and *Lupinus chamissonis* occur together or alone in the shrub canopy with *Artemisia californica*, *Artemisia pycnocephala*, *Ephedra californica*, *Isocoma menziesii*, *Lupinus arboreus*, *Opuntia littoralis*, *Rhus integrifolia*, and *Toxicodendron diversilobum*.

This alliance occurs as isolated patches along California coastline. It shares species with the *Abronia latifolia* – *Ambrosia chamissonis* Alliance and other coastal scrub alliances. Stands tend to occupy settings on active dunes that are more exposed than other coastal shrubby alliances such as *Lupinus arboreus* or *Baccharis pilularis*.

Sonoma County

Stands of this alliance are rare in the county. Although individual botanical collections of *Lupinus chamissonis* extend north to southern Mendocino County, individuals of *Ericameria ericoides* and stands of the *Lupinus chamissonis* – *Ericameria ericoides* Alliance do not appear to extend north of Bodega Bay and Bodega Head at the southwestern corner of Sonoma County.

**Local Alliance Summary (n = 1)**

**Elevation:** 45 ft

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 30.0         | 30            | –          |
| <b>Herb</b>                          | 14.0         | 14            | <0.5–0.5   |
| <b>Shrub</b>                         | 18.0         | 18            | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 8.0°  | 8°    |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 0.0%  | 0%    |
| Bare ground cover | 92.0% | 92%   |
| Litter cover      | 5.0%  | 5%    |

**Associations within this Alliance:**

*Lupinus chamissonis* – *Ericameria ericoides* Association

**STAND TABLE**

***Lupinus chamissonis* – *Ericameria ericoides* Alliance**

n = 1

| Lifeform            | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|---------------------|--------|--|-----|------|------|------|
| <b>Shrub</b>        |        |  |     |      |      |      |
|                     | ERER11 | <i>Ericameria ericoides</i>                      | 100 | 12.0 | 12.0 | 12.0 |
|                     | LUCH   | <i>Lupinus chamissonis</i>                       | 100 | 5.0  | 5.0  | 5.0  |
|                     | LUAR   | <i>Lupinus arboreus</i>                          | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |  |     |      |      |      |
|                     | ERLA5  | <i>Eriogonum latifolium</i>                      | 100 | 8.0  | 8.0  | 8.0  |
|                     | JULE   | <i>Juncus lesueurii</i>                          | 100 | 2.0  | 2.0  | 2.0  |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 2.0  | 2.0  | 2.0  |
|                     | ACMI2  | <i>Achillea millefolium</i>                      | 100 | 1.0  | 1.0  | 1.0  |
|                     | BRDI3  | <i>Bromus diandrus</i>                           | 100 | 1.0  | 1.0  | 1.0  |
|                     | CARA3  | <i>Cardionema ramosissimum</i>                   | 100 | 1.0  | 1.0  | 1.0  |
|                     | VUBR   | <i>Vulpia bromoides</i>                          | 100 | 1.0  | 1.0  | 1.0  |
|                     | ABLA2  | <i>Abronia latifolia</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|                     | CAMI22 | <i>Camissonia micrantha</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|                     | ERGL3  | <i>Erigeron glaucus</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|                     | ESCA2  | <i>Eschscholzia californica</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|                     | FRCH   | <i>Fragaria chiloensis</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|                     | PODO   | <i>Poa douglasii</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|                     | POPA7  | <i>Polygonum paronychia</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|                     | AMAR4  | <i>Ammophila arenaria</i>                        | 100 | 0.1  | 0.1  | 0.1  |
|                     | LAOV   | <i>Lagurus ovatus</i>                            | 100 | 0.1  | 0.1  | 0.1  |
| <b>Non-vascular</b> |        |  |     |      |      |      |
|                     | 2MOSS  | Moss   | 100 | 4.0  | 4.0  | 4.0  |

***Lupinus chamissonis* – *Ericameria ericoides* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 30.0         | 30            | –          |
| Herb             | 14.0         | 14            | <0.5–0.5   |
| Shrub            | 18.0         | 18            | <0.5–0.5   |

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)

**Macrotopography:** lower to upper 1/3 of slope (1)

**Microtopography:** convex (1)

**Parent material:** sandstone (1)

**Soil texture:** sand (1)

**Slope steepness:** moderate/6-25° (1)

|                   | Mean   | Range  |
|-------------------|--------|--------|
| Elevation         | 45 ft. | 45 ft. |
| Slope             | 8.0°   | 8°     |
| Large rock cover  | 0.0%   | 0%     |
| Small rock cover  | 0.0%   | 0%     |
| Bare ground cover | 92.0%  | 92%    |
| Litter cover      | 5.0%   | 5%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0105

**Relevés:** none

**SCV Global/State Rank:** G2/S2<sup>1</sup>

**STAND TABLE**

***Lupinus chamissonis* – *Ericameria ericoides* Association**

n = 1

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | ERER11 | <i>Ericameria ericoides</i>                      | 100 | 12.0 | 12.0 | 12.0 |
|          | LUCH   | <i>Lupinus chamissonis</i>                       | 100 | 5.0  | 5.0  | 5.0  |
|          | LUAR   | <i>Lupinus arboreus</i>                          | 100 | 0.2  | 0.2  | 0.2  |
| Herb     | ERLA5  | <i>Eriogonum latifolium</i>                      | 100 | 8.0  | 8.0  | 8.0  |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 2.0  | 2.0  | 2.0  |
|          | JULE   | <i>Juncus lesueurii</i>                          | 100 | 2.0  | 2.0  | 2.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 100 | 1.0  | 1.0  | 1.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 100 | 1.0  | 1.0  | 1.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 100 | 1.0  | 1.0  | 1.0  |
|          | CARA3  | <i>Cardionema ramosissimum</i>                   | 100 | 1.0  | 1.0  | 1.0  |
|          | POPA7  | <i>Polygonum paronychia</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|          | PODO   | <i>Poa douglasii</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|          | FRCH   | <i>Fragaria chiloensis</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|          | ESCA2  | <i>Eschscholzia californica</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|          | ERGL3  | <i>Erigeron glaucus</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|          | ABLA2  | <i>Abronia latifolia</i>                         | 100 | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Lupinus chamissonis* – *Ericameria ericoides* Association**

n = 1

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>       | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|-----------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                             |            |            |            |            |
|                     | CAMI22      | <i>Camissonia micrantha</i> | 100        | 0.2        | 0.2        | 0.2        |
|                     | AMAR4       | <i>Ammophila arenaria</i>   | 100        | 0.1        | 0.1        | 0.1        |
|                     | LAOV        | <i>Lagurus ovatus</i>       | 100        | 0.1        | 0.1        | 0.1        |
| <b>Non-vascular</b> |             |                             |            |            |            |            |
|                     | 2MOSS       | Moss                        | 100        | 4.0        | 4.0        | 4.0        |

***Morella californica* – *Rubus spectabilis* Provisional Alliance**  
**California wax myrtle – salmonberry thickets**

Statewide (Sawyer et al. 2009<sup>1</sup>)

Sawyer et al. (2009) treated *Morella californica* in a separate alliance, and *Rubus spectabilis* and *R. parviflorus* were considered more broadly within the mixed *Rubus* (*parviflorus*, *spectabilis*, *ursinus*) Alliance. Recently, the peer review panel of the NVC has determined that these species should be merged into a single alliance due to similar ecological conditions and overlapping species. Thus, *Morella* and either *Rubus spectabilis* or *R. parviflorus*, or both, are considered together in a single alliance. The treatment below incorporates these new changes.

*Morella californica* and/or *Rubus spectabilis* dominate or form various mixtures in the shrub canopy with *Baccharis pilularis*, *Garrya elliptica*, *Gaultheria shallon*, *Holodiscus discolor*, *Lonicera involucrata*, *Marah fabaceus*, *Ribes sanguineum*, *Rubus parviflorus*, *Rubus ursinus*, *Sambucus racemosa*, *Toxicodendron diversilobum*, and *Vaccinium ovatum*. Emergent trees may be present at low cover, including *Picea sitchensis* or *Pinus contorta* ssp. *contorta*.

*Morella californica* – *Rubus spectabilis* stands are generally small (< 1 ha) and close to the coast on moist or wet soils with high water tables. Stands at Point Reyes National Seashore (Keeler-Wolf et al. 2003a), at Bodega Bay and other Sonoma County coastal settings (this report), and in the Lanphere Dunes unit of Humboldt Bay Refuge characterize the alliance.

*Rubus spectabilis* and *R. parviflorus* have similar environmental requirements along the coast of northern California. Both tend to occupy swales, moist bluffs, seeps, or riparian borders along with other cold-deciduous shrubs such as *Lonicera involucrata* ssp. *ledebourii*. All stands dominated or co-dominated by these species are considered part of this alliance.

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Stands of this alliance are not known to occur more than 3 km away from the coast in Sonoma County. Whether dominated by *Morella*, *Rubus spectabilis*, *R. parviflorus*, or *Lonicera involucrata*, or a mixture of the four, these stands share ecological settings. They are found in swales, coastal ravines, freshwater wetland edges surrounded by coastal grassland, or on the upper border of coastal salt marshes, as at Bodega Bay. Less common locations are swamp, seep, or pond margins surrounded by redwood forest. All known stands are small (< 1 ha).

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**Local Alliance Summary (n = 11)**

**Elevation:** 6–352 ft, mean 114 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

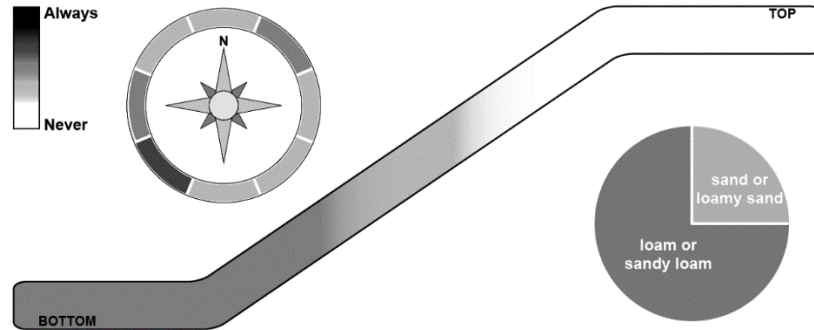
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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 71.4         | 36–100        | –          |
| <b>Herb</b>                          | 22.6         | 0–49          | <0.5–5     |
| <b>Shrub</b>                         | 57.8         | 15–95         | 1–10       |
| <b>Regenerating/understory tree*</b> | 0.3          | 0–2           | <0.5–5     |
| <b>Hardwood</b>                      | 0.4          | 0–2           | 2–5        |
| <b>Conifer</b>                       | 0.4          | 0–3           | 2–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 2.1°  | 0–4°   |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.9%  | 0–6%   |
| <b>Bare ground cover</b> | 13.6% | 0–69%  |
| <b>Litter cover</b>      | 76.3% | 30–98% |

**Associations within this Alliance:**

- Morella californica* – *Rubus* spp. Provisional Association
- Rubus parviflorus* Association
- Rubus spectabilis* Association

**STAND TABLE**

***Morella californica* - *Rubus spectabilis* Provisional Alliance**

n = 11

| Lifeform     | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--------------|--------|-----------------------------------|-----|------|------|------|
| <b>Shrub</b> | RUUR   | <i>Rubus ursinus</i>              | 73  | 8.1  | 0.2  | 21.0 |
|              | MOCA6  | <i>Morella californica</i>        | 64  | 49.4 | 12.0 | 75.0 |
|              | RUPA   | <i>Rubus parviflorus</i>          | 45  | 19.4 | 1.0  | 70.0 |
|              | RUSP   | <i>Rubus spectabilis</i>          | 45  | 11.5 | 0.2  | 31.0 |
|              | BAPI   | <i>Baccharis pilularis</i>        | 45  | 1.7  | 0.2  | 3.0  |
|              | FRCA12 | <i>Frangula californica</i>       | 27  | 6.7  | 0.2  | 15.0 |
|              | TODI   | <i>Toxicodendron diversilobum</i> | 27  | 2.3  | 1.0  | 3.0  |
| <b>Herb</b>  | POMU   | <i>Polystichum munitum</i>        | 64  | 6.7  | 0.2  | 15.0 |
|              | ATFI   | <i>Athyrium filix-femina</i>      | 45  | 3.5  | 0.2  | 15.0 |

**STAND TABLE** continued

**Morella californica - Rubus spectabilis Provisional Alliance**

n = 11

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min | Max  |
|--------------|--------|--|-----|------|-----|------|
| Herb         |        |  |     |      |     |      |
|              | CAOB3  | <i>Carex obnupta</i>                             | 45  | 1.3  | 0.2 | 3.0  |
|              | EQTEB  | <i>Equisetum telmateia</i> var. <i>braunii</i>   | 27  | 11.8 | 0.2 | 35.0 |
|              | SCMI2  | <i>Scirpus microcarpus</i>                       | 27  | 7.7  | 3.0 | 15.0 |
|              | HOLA   | <i>Holcus lanatus</i>                            | 27  | 2.1  | 0.2 | 5.0  |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 27  | 0.7  | 0.2 | 1.0  |
| Non-vascular |        |  |     |      |     |      |
|              | 2MOSS  | Moss   | 27  | 0.7  | 0.2 | 1.0  |

**Morella californica – Rubus spp. Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) and Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 70.5         | 36–97         | –          |
| Herb                          | 18.4         | 0–49          | <0.5–1     |
| Shrub                         | 63.5         | 28–95         | 2–10       |
| Regenerating/understory tree* | 0.2          | 0–1           | <0.5–5     |
| Hardwood                      | 0.3          | 0–2           | 2–5        |
| Conifer                       | 0.6          | 0–3           | 5–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), NE (1), SW (3)

**Macrotopography:** bottom (2), lower 1/3 of slope (3), middle 1/3 of slope (1)

**Microtopography:** concave (2), flat (3)

**Parent material:** Franciscan melange (1), igneous (1), mixed alluvium (1), sandstone (1), sedimentary (2)

**Soil texture:** loam or sandy loam (2), sand (1)

**Slope steepness:** flat/0° (2), gentle/1–5° (3)

|                   | Mean    | Range     |
|-------------------|---------|-----------|
| Elevation         | 114 ft. | 6–313 ft. |
| Slope             | 2.0°    | 0–4°      |
| Large rock cover  | 0.0%    | 0–0%      |
| Small rock cover  | 1.0%    | 0–6%      |
| Bare ground cover | 14.8%   | 0–69%     |
| Litter cover      | 81.7%   | 30–98%    |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** SONO0037, SONO0101, SONO0443, SONO0663, SONO0725, SONO2183

**Relevés:** none

SCV Global/State Rank: G3/S3<sup>1</sup>

**STAND TABLE**

***Morella californica* – *Rubus* spp. Provisional Association**

n = 6

| Lifeform            | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|---------------------|--------|--|-----|------|------|------|
| <b>Tree</b>         |        |  |     |      |      |      |
|                     | PIMU   | <i>Pinus muricata</i>                            | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>        |        |  |     |      |      |      |
|                     | MOCA6  | <i>Morella californica</i>                       | 100 | 55.7 | 25.0 | 75.0 |
|                     | RUUR   | <i>Rubus ursinus</i>                             | 83  | 9.3  | 0.2  | 21.0 |
|                     | BAPI   | <i>Baccharis pilularis</i>                       | 67  | 1.4  | 0.2  | 3.0  |
|                     | FRCA12 | <i>Frangula californica</i>                      | 50  | 6.7  | 0.2  | 15.0 |
|                     | TODI   | <i>Toxicodendron diversilobum</i>                | 33  | 2.0  | 1.0  | 3.0  |
|                     | RUPA   | <i>Rubus parviflorus</i>                         | 33  | 1.0  | 1.0  | 1.0  |
|                     | RUSP   | <i>Rubus spectabilis</i>                         | 33  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>         |        |  |     |      |      |      |
|                     | POMU   | <i>Polystichum munitum</i>                       | 83  | 6.0  | 0.2  | 15.0 |
|                     | ATFI   | <i>Athyrium filix-femina</i>                     | 50  | 5.4  | 0.2  | 15.0 |
|                     | HOLA   | <i>Holcus lanatus</i>                            | 50  | 2.1  | 0.2  | 5.0  |
|                     | CAOB3  | <i>Carex obnupta</i>                             | 50  | 1.4  | 0.2  | 3.0  |
|                     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 50  | 0.7  | 0.2  | 1.0  |
|                     | EQUIS  | <i>Equisetum</i>                                 | 33  | 9.5  | 2.0  | 17.0 |
|                     | SCMI2  | <i>Scirpus microcarpus</i>                       | 33  | 9.0  | 3.0  | 15.0 |
|                     | JUAR2  | <i>Juncus arcticus</i>                           | 33  | 1.1  | 0.2  | 2.0  |
|                     | AREG   | <i>Argentina egedii</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|                     | VEFI2  | <i>Veratrum fimbriatum</i>                       | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |  |     |      |      |      |
|                     | 2MOSS  | Moss   | 50  | 0.7  | 0.2  | 1.0  |

***Rubus parviflorus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 80.0         | 60–100        | –          |
| <b>Herb</b>                          | 24.0         | 10–38         | 1–5        |
| <b>Shrub</b>                         | 67.0         | 55–79         | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Summary of Environmental Data**

**Aspect:** SW (2)  
**Macrotopography:** bottom (1), bottom to lower 1/3 of slope (1)  
**Microtopography:** concave (1), flat (1)  
**Parent material:** mixed alluvium (1), sedimentary (1)  
**Soil texture:** no data  
**Slope steepness:** flat/0° (1), gentle/1-5° (1)  
**Elevation:** range 21–82 ft., mean 52 ft.  
**Slope:** range 0–4°, mean 2.0°

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0394, SONO0974  
**Relevés:** none

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

**STAND TABLE**

***Rubus parviflorus* Association**

n = 2

| Lifeform     | Code  | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--------------|-------|--|-----|------|------|------|
| <b>Shrub</b> |       |  |     |      |      |      |
|              | RUPA  | <i>Rubus parviflorus</i>                           | 100 | 42.5 | 15.0 | 70.0 |
|              | RUUR  | <i>Rubus ursinus</i>                               | 100 | 6.5  | 4.0  | 9.0  |
|              | LOINL | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 50  | 30.0 | 30.0 | 30.0 |
|              | SALA6 | <i>Salix lasiolepis</i>                            | 50  | 5.0  | 5.0  | 5.0  |
|              | BAPI  | <i>Baccharis pilularis</i>                         | 50  | 3.0  | 3.0  | 3.0  |
|              | TODI  | <i>Toxicodendron diversilobum</i>                  | 50  | 3.0  | 3.0  | 3.0  |
|              | RUSP  | <i>Rubus spectabilis</i>                           | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  |       |  |     |      |      |      |
|              | EQTEB | <i>Equisetum telmateia</i> var. <i>braunii</i>     | 100 | 17.6 | 0.2  | 35.0 |
|              | POMU  | <i>Polystichum munitum</i>                         | 50  | 5.0  | 5.0  | 5.0  |
|              | STAJ  | <i>Stachys ajugoides</i>                           | 50  | 3.0  | 3.0  | 3.0  |
|              | MAFA3 | <i>Marah fabaceus</i>                              | 50  | 3.0  | 3.0  | 3.0  |
|              | ERST9 | <i>Eriophyllum stoechadifolium</i>                 | 50  | 0.2  | 0.2  | 0.2  |
|              | LATHY | <i>Lathyrus</i>                                    | 50  | 0.2  | 0.2  | 0.2  |
|              | URDI  | <i>Urtica dioica</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|              | ATFI  | <i>Athyrium filix-femina</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|              | CAOB3 | <i>Carex obnupta</i>                               | 50  | 0.2  | 0.2  | 0.2  |

***Rubus spectabilis* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 74.5         | 68–81         | –          |
| <b>Herb</b>             | 22.5         | 8–37          | 0.5–1      |
| <b>Shrub</b>            | 53.0         | 31–75         | 1–5        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SW (1)  
**Macrotopography:** bottom (2)  
**Microtopography:** concave (1), flat (1)  
**Parent material:** metasedimentary (1), sedimentary (1)  
**Soil texture:** loam or sandy loam (1)  
**Slope steepness:** gentle/1-5° (2)  
**Elevation:** range 57–58 ft., mean 58 ft.  
**Slope:** range 3–4°, mean 3.5°

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0393, SONO0412  
**Relevés:** none

**SCV Global/State Rank:** G4/S2??<sup>1</sup>

**STAND TABLE**

***Rubus spectabilis* Association**

n = 2

| Lifeform | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | RUSP   | <i>Rubus spectabilis</i>                       | 100 | 28.0 | 25.0 | 31.0 |
|          | COSE16 | <i>Cornus sericea</i>                          | 50  | 35.0 | 35.0 | 35.0 |
|          | RUPA   | <i>Rubus parviflorus</i>                       | 50  | 10.0 | 10.0 | 10.0 |
|          | SARAR3 | <i>Sambucus racemosa</i> var. <i>racemosa</i>  | 50  | 8.0  | 8.0  | 8.0  |
|          | RUUR   | <i>Rubus ursinus</i>                           | 50  | 5.0  | 5.0  | 5.0  |
|          | SALA6  | <i>Salix lasiolepis</i>                        | 50  | 2.0  | 2.0  | 2.0  |
| Herb     | HEMA80 | <i>Heracleum maximum</i>                       | 100 | 2.0  | 1.0  | 3.0  |
|          | SCCA2  | <i>Scrophularia californica</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | VINIG  | <i>Vicia nigricans</i> ssp. <i>gigantea</i>    | 50  | 22.0 | 22.0 | 22.0 |
|          | POMU   | <i>Polystichum munitum</i>                     | 50  | 12.0 | 12.0 | 12.0 |
|          | MAFA3  | <i>Marah fabaceus</i>                          | 50  | 1.0  | 1.0  | 1.0  |
|          | ARDO3  | <i>Artemisia douglasiana</i>                   | 50  | 1.0  | 1.0  | 1.0  |
|          | URDI   | <i>Urtica dioica</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|          | EQTEB  | <i>Equisetum telmateia</i> var. <i>braunii</i> | 50  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Quercus berberidifolia* – *Adenostoma fasciculatum* Alliance**  
**Scrub oak – chamise chaparral**

Statewide (Sawyer et al. 2009)

*Adenostoma fasciculatum* and *Quercus berberidifolia* are co-dominant in the shrub canopy with *Arctostaphylos* spp., *Ceanothus crassifolius*, *Ceanothus greggii*, *Ceanothus leucodermis*, *Cercocarpus montanus*, *Heteromeles arbutifolia*, *Rhamnus ilicifolia*, and *Xylococcus bicolor*. Emergent trees may be present at low cover, including *Pinus attenuata*, *Quercus agrifolia*, or *Quercus engelmannii*.

This alliance typically marks an ecological interface between relatively mesic and relatively xeric sites. *Quercus berberidifolia* – *Adenostoma fasciculatum* stands are commonly located on lower to upper concave southerly aspects, or upper convex northerly aspects with well-drained soil. *Heteromeles arbutifolia* has a relatively high constancy in this alliance but low average cover.

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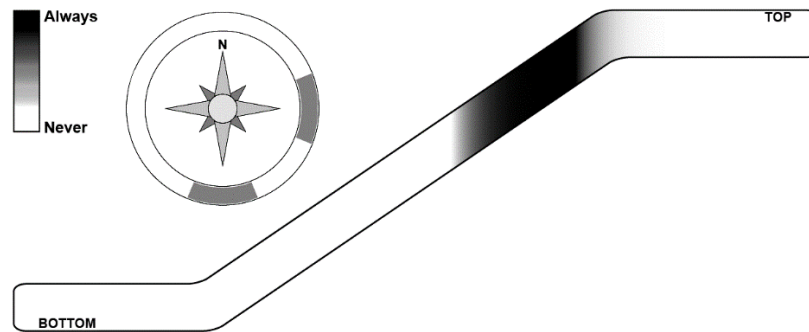
Only two stands of this widespread alliance were sampled in Sonoma County. Both samples are in the interior of the county and occur within larger extents of chaparral stands on volcanic rock.

**Local Alliance Summary (n = 2)**

**Elevation:** 1306–1409 ft, mean 1358 ft

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 78.0         | 70–86         | –          |
| <b>Herb</b>                          | 13.5         | 5–22          | <0.5–0.5   |
| <b>Shrub</b>                         | 71.5         | 60–83         | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 18.0° | 9–27°  |
| Large rock cover  | 4.2%  | 0–8%   |
| Small rock cover  | 9.0%  | 6–12%  |
| Bare ground cover | 43.0% | 29–57% |
| Litter cover      | 43.5% | 37–50% |

**Associations within this Alliance:**

*Quercus berberidifolia* – *Adenostoma fasciculatum* Association

**STAND TABLE**

***Quercus berberidifolia* – *Adenostoma fasciculatum* Alliance**

n = 2

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | QUAG   | <i>Quercus agrifolia</i>                              | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                        | 100 | 31.5 | 25.0 | 38.0 |
|  | QUBE5  | <i>Quercus berberidifolia</i>                         | 100 | 24.5 | 15.0 | 34.0 |
|  | CECU   | <i>Ceanothus cuneatus</i>                             | 100 | 4.5  | 2.0  | 7.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                     | 100 | 3.0  | 1.0  | 5.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                            | 50  | 7.0  | 7.0  | 7.0  |
|  | QUDU4  | <i>Quercus durata</i>                                 | 50  | 5.0  | 5.0  | 5.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>   | 50  | 3.0  | 3.0  | 3.0  |
|  | GAEL   | <i>Garrya elliptica</i>                               | 50  | 1.0  | 1.0  | 1.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                        | 50  | 1.0  | 1.0  | 1.0  |
|  | RHCR   | <i>Rhamnus crocea</i>                                 | 50  | 1.0  | 1.0  | 1.0  |
|  | ARMAM2 | <i>Arctostaphylos manzanita</i> ssp. <i>manzanita</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | LOIN4  | <i>Lonicera interrupta</i>                            | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AGHA2  | <i>Agrostis hallii</i>                                | 50  | 5.0  | 5.0  | 5.0  |
|  | AVENA  | <i>Avena</i>  | 50  | 5.0  | 5.0  | 5.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                              | 50  | 5.0  | 5.0  | 5.0  |
|  | FESTU  | <i>Festuca</i>  | 50  | 5.0  | 5.0  | 5.0  |
|  | BRDI2  | <i>Brachypodium distachyon</i>                        | 50  | 3.0  | 3.0  | 3.0  |
|  | METO   | <i>Melica torreyana</i>                               | 50  | 1.0  | 1.0  | 1.0  |
|  | CAGL7  | <i>Carex globosa</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|  | CEME2  | <i>Centaurea melitensis</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|  | CHPO3  | <i>Chlorogalum pomeridianum</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|  | GALIU  | <i>Galium</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | HYPE   | <i>Hypericum perforatum</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|  | MICRO5 | <i>Micropus</i>                                       | 50  | 0.2  | 0.2  | 0.2  |
|  | PETR7  | <i>Pentagramma triangularis</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|  | SANIC  | <i>Sanicula</i>                                       | 50  | 0.2  | 0.2  | 0.2  |
|  | SILEN  | <i>Silene</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | STACH  | <i>Stachys</i>  | 50  | 0.2  | 0.2  | 0.2  |
|  | TOAR   | <i>Torilis arvensis</i>                               | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2LICHN | Lichen  | 100 | 0.6  | 0.2  | 1.0  |
|  | 2MOSS  | Moss  | 100 | 0.6  | 0.2  | 1.0  |

***Quercus berberidifolia* – *Adenostoma fasciculatum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 78.0         | 70–86         | –          |
| <b>Herb</b>                          | 13.5         | 5–22          | <0.5–0.5   |
| <b>Shrub</b>                         | 71.5         | 60–83         | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (1)

**Macrotopography:** upper 1/3 of slope (2)

**Microtopography:** convex (2)

**Parent material:** volcanic (2)

**Soil texture:** no data

**Slope steepness:** moderate/6-25° (1), steep/>25° (1)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 1358 ft. | 1306–1409 ft. |
| <b>Slope</b>             | 18.0°    | 9–27°         |
| <b>Large rock cover</b>  | 4.2%     | 0–8%          |
| <b>Small rock cover</b>  | 9.0%     | 6–12%         |
| <b>Bare ground cover</b> | 43.0%    | 29–57%        |
| <b>Litter cover</b>      | 43.5%    | 37–50%        |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0833, SONO2201

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus berberidifolia* – *Adenostoma fasciculatum* Association**

n = 2

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QUAG  | <i>Quercus agrifolia</i>          | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | ADFA  | <i>Adenostoma fasciculatum</i>    | 100 | 31.5 | 25.0 | 38.0 |
|  | QUBE5 | <i>Quercus berberidifolia</i>     | 100 | 24.5 | 15.0 | 34.0 |
|  | CECU  | <i>Ceanothus cuneatus</i>         | 100 | 4.5  | 2.0  | 7.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 100 | 3.0  | 1.0  | 5.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 50  | 7.0  | 7.0  | 7.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Quercus berberidifolia* – *Adenostoma fasciculatum* Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                 | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---|------------|------------|------------|------------|
| <b>Shrub</b>        |             |   |            |            |            |            |
|                     | QUDU4       | <i>Quercus durata</i>                                 | 50         | 5.0        | 5.0        | 5.0        |
|                     | DIAUA       | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>   | 50         | 3.0        | 3.0        | 3.0        |
|                     | GAEL        | <i>Garrya elliptica</i>                               | 50         | 1.0        | 1.0        | 1.0        |
|                     | HEAR5       | <i>Heteromeles arbutifolia</i>                        | 50         | 1.0        | 1.0        | 1.0        |
|                     | RHCR        | <i>Rhamnus crocea</i>                                 | 50         | 1.0        | 1.0        | 1.0        |
|                     | ARMAM2      | <i>Arctostaphylos manzanita</i> ssp. <i>manzanita</i> | 50         | 0.2        | 0.2        | 0.2        |
|                     | LOIN4       | <i>Lonicera interrupta</i>                            | 50         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>         |             |   |            |            |            |            |
|                     | AGHA2       | <i>Agrostis hallii</i>                                | 50         | 5.0        | 5.0        | 5.0        |
|                     | AVENA       | <i>Avena</i>  | 50         | 5.0        | 5.0        | 5.0        |
|                     | BRHO2       | <i>Bromus hordeaceus</i>                              | 50         | 5.0        | 5.0        | 5.0        |
|                     | FESTU       | <i>Festuca</i>  | 50         | 5.0        | 5.0        | 5.0        |
|                     | BRDI2       | <i>Brachypodium distachyon</i>                        | 50         | 3.0        | 3.0        | 3.0        |
|                     | METO        | <i>Melica torreyana</i>                               | 50         | 1.0        | 1.0        | 1.0        |
|                     | PETR7       | <i>Pentagramma triangularis</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | TOAR        | <i>Torilis arvensis</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|                     | STACH       | <i>Stachys</i>  | 50         | 0.2        | 0.2        | 0.2        |
|                     | SANIC       | <i>Sanicula</i>                                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | MICRO5      | <i>Micropus</i>                                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | HYPE        | <i>Hypericum perforatum</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                     | GALIU       | <i>Galium</i>   | 50         | 0.2        | 0.2        | 0.2        |
|                     | CHPO3       | <i>Chlorogalum pomeridianum</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | CEME2       | <i>Centaurea melitensis</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                     | CAGL7       | <i>Carex globosa</i>                                  | 50         | 0.2        | 0.2        | 0.2        |
|                     | SILEN       | <i>Silene</i>   | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |   |            |            |            |            |
|                     | 2LICHN      | Lichen  | 100        | 0.6        | 0.2        | 1.0        |
|                     | 2MOSS       | Moss  | 100        | 0.6        | 0.2        | 1.0        |

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## ***Quercus berberidifolia* Alliance**

### **Scrub oak chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus berberidifolia* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Adenostoma sparsifolium*, *Arctostaphylos glandulosa*, *Arctostaphylos glauca*, *Ceanothus greggii*, *Ceanothus leucodermis*, *Ceanothus thyrsiflorus*, *Frangula californica*, *Fraxinus dipetala*, *Heteromeles arbutifolia*, *Pickeringia montana*, *Prunus ilicifolia*, *Quercus wislizeni*, *Rhamnus ilicifolia*, *Rhus ovata*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Aesculus californica*, *Juglans californica*, *Pinus sabiniana*, or *Quercus agrifolia*.

Stands of *Quercus berberidifolia* typically occur on mesic, north-facing slopes in cismontane California. This is the most common scrub oak alliance in the state, and it occurs on many substrates. Careful oak identification is necessary in correctly assigning stands with *Quercus berberidifolia*, especially since *Quercus berberidifolia* hybridizes with the shrubs *Q. dumosa*, *Q. durata*, and *Q. john-tuckeri* and with the tree *Q. engelmannii* (Nixon 2002). Many other shrub species occur in *Q. berberidifolia* stands, usually at low cover. Sometimes, however, they approach *Q. berberidifolia* in cover, as in the Scrub oak – birchleaf mountain mahogany series described by Gordon and White (1994) and Sawyer and Keeler-Wolf (1995).

### Sonoma County

Stands of the *Quercus berberidifolia* Alliance are widespread in the interior of Sonoma County, generally associated with other stands of chaparral on northerly facing slopes. Some stands have gone many decades without fire and these tend to be dominated by arborescent multi-stemmed individuals, with a relatively open grassy understory. Such stands resemble dwarfed oak woodlands.

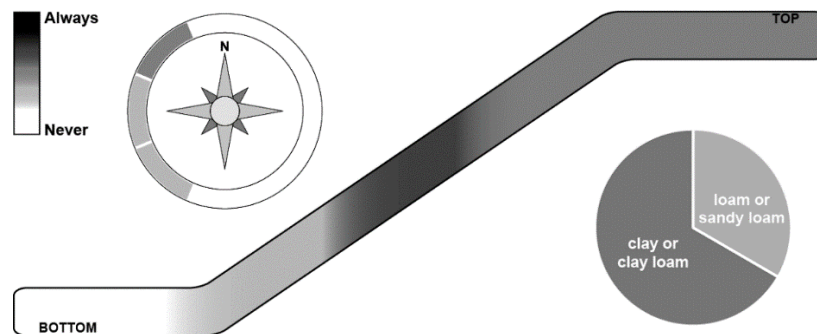
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### **Local Alliance Summary (n = 4)**

**Elevation:** 365–2691 ft, mean 1364 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 49.3         | 42–60         | –          |
| <b>Herb</b>                          | 6.8          | 2–16          | <0.5–0.5   |
| <b>Shrub</b>                         | 44.3         | 35–60         | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 2.6          | 0–10          | 2–35       |
| <b>Hardwood</b>                      | 0.3          | 0–1           | 2–5        |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 16.7° | 12–20° |
| <b>Large rock cover</b>  | 0.3%  | 0–1%   |
| <b>Small rock cover</b>  | 14.3% | 3–41%  |
| <b>Bare ground cover</b> | 32.5% | 20–54% |
| <b>Litter cover</b>      | 50.8% | 32–68% |

**Associations within this Alliance:**

*Quercus berberidifolia* – *Cercocarpus montanus* Association

*Quercus berberidifolia* Association

**STAND TABLE**

***Quercus berberidifolia* Alliance**

n = 4

| Lifeform                               | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUDO   | <i>Quercus douglasii</i>                            | 25  | 1.0  | 1.0  | 1.0  |
|  | QUERC  | <i>Quercus</i>                                      | 25  | 0.2  | 0.2  | 0.2  |
|  | QUCH2  | <i>Quercus chrysolepis</i>                          | 25  | 0.2  | 0.2  | 0.2  |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                   | 50  | 1.7  | 0.2  | 3.2  |
|  | QUPAS2 | <i>Quercus parvula</i> var. <i>shrevei</i>          | 25  | 7.2  | 7.2  | 7.2  |
|  | ARME   | <i>Arbutus menziesii</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|  | PSME   | <i>Pseudotsuga menziesii</i>                        | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | QUBE5  | <i>Quercus berberidifolia</i>                       | 100 | 34.3 | 24.0 | 40.0 |
|  | LOHI2  | <i>Lonicera hispidula</i>                           | 75  | 0.5  | 0.2  | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                   | 50  | 4.0  | 2.0  | 6.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                          | 50  | 1.1  | 0.2  | 2.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 50  | 1.1  | 0.2  | 2.0  |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>      | 25  | 24.0 | 24.0 | 24.0 |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                      | 25  | 8.0  | 8.0  | 8.0  |
|  | ARCA5  | <i>Arctostaphylos canescens</i>                     | 25  | 4.0  | 4.0  | 4.0  |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                    | 25  | 0.2  | 0.2  | 0.2  |
|  | ARVI4  | <i>Arctostaphylos viscida</i>                       | 25  | 0.2  | 0.2  | 0.2  |
|  | CECU   | <i>Ceanothus cuneatus</i>                           | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus berberidifolia* Alliance**

n = 4

| Lifeform            | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|---------------------|--------|--|-----|------|------|------|
| <b>Shrub</b>        |        |  |     |      |      |      |
|                     | FRCA12 | <i>Frangula californica</i>                          | 25  | 0.2  | 0.2  | 0.2  |
|                     | GAFR   | <i>Garrya fremontii</i>                              | 25  | 0.2  | 0.2  | 0.2  |
|                     | HEAR5  | <i>Heteromeles arbutifolia</i>                       | 25  | 0.2  | 0.2  | 0.2  |
|                     | LUAL4  | <i>Lupinus albifrons</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|                     | ROSA5  | <i>Rosa</i>  | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>         |        |  |     |      |      |      |
|                     | BRMA   | <i>Briza maxima</i>                                  | 25  | 10.0 | 10.0 | 10.0 |
|                     | CYEC   | <i>Cynosurus echinatus</i>                           | 25  | 9.0  | 9.0  | 9.0  |
|                     | BRDI3  | <i>Bromus diandrus</i>                               | 25  | 1.0  | 1.0  | 1.0  |
|                     | WHMO   | <i>Whipplea modesta</i>                              | 25  | 1.0  | 1.0  | 1.0  |
|                     | AVBA   | <i>Avena barbata</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|                     | BRDI2  | <i>Brachypodium distachyon</i>                       | 25  | 0.2  | 0.2  | 0.2  |
|                     | BRMA3  | <i>Bromus madritensis</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|                     | CEME2  | <i>Centaurea melitensis</i>                          | 25  | 0.2  | 0.2  | 0.2  |
|                     | CRFL4  | <i>Cryptantha flaccida</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|                     | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 25  | 0.2  | 0.2  | 0.2  |
|                     | ERCI6  | <i>Erodium cicutarium</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|                     | GAPO   | <i>Galium porrigens</i>                              | 25  | 0.2  | 0.2  | 0.2  |
|                     | GAPH2  | <i>Gastidium phleoides</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|                     | LAJEC  | <i>Lathyrus jepsonii</i> ssp. <i>californicus</i>    | 25  | 0.2  | 0.2  | 0.2  |
|                     | LOGA2  | <i>Logfia gallica</i>                                | 25  | 0.2  | 0.2  | 0.2  |
|                     | MELIC  | <i>Melica</i>  | 25  | 0.2  | 0.2  | 0.2  |
|                     | PETR7  | <i>Pentagramma triangularis</i>                      | 25  | 0.2  | 0.2  | 0.2  |
|                     | PEDU2  | <i>Petrorhagia dubia</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|                     | POCA5  | <i>Polygala californica</i>                          | 25  | 0.2  | 0.2  | 0.2  |
|                     | POMU   | <i>Polystichum munitum</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|                     | SACR2  | <i>Sanicula crassicaulis</i>                         | 25  | 0.2  | 0.2  | 0.2  |
|                     | SCAND  | <i>Scandix</i>                                       | 25  | 0.2  | 0.2  | 0.2  |
|                     | SHAR2  | <i>Sherardia arvensis</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|                     | TORIL  | <i>Torilis</i>                                       | 25  | 0.2  | 0.2  | 0.2  |
|                     | VUMY   | <i>Vulpia myuros</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |  |     |      |      |      |
|                     | 2MOSS  | Moss   | 75  | 7.0  | 4.0  | 13.0 |
|                     | 2LICHN | Lichen   | 50  | 3.6  | 0.2  | 7.0  |

***Quercus berberidifolia* – *Cercocarpus montanus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 60.0         | 60            | –          |
| <b>Herb</b>             | 7.0          | 7             | <0.5–0.5   |
| <b>Shrub</b>            | 60.0         | 60            | 2–5        |

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 1.0          | 1             | 2–5        |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (1)  
**Macrotopography:** lower to middle 1/3 of slope (1)  
**Microtopography:** concave (1)  
**Parent material:** sandstone (1)  
**Soil texture:** loam or sandy loam (1)  
**Slope steepness:** moderate/6-25° (1)

|                   | Mean    | Range   |
|-------------------|---------|---------|
| Elevation         | 365 ft. | 365 ft. |
| Slope             | 12.0°   | 12°     |
| Large rock cover  | 0.0%    | 0%      |
| Small rock cover  | 5.0%    | 5%      |
| Bare ground cover | 54.0%   | 54%     |
| Litter cover      | 40.0%   | 40%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0170  
**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**STAND TABLE**

***Quercus berberidifolia* – *Cercocarpus montanus* Association**

n = 1

| Lifeform            | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|---------------------|--------|--|-----|------|------|------|
| <b>Tree</b>         |        |  |     |      |      |      |
|                     | QUDO   | <i>Quercus douglasii</i>                       | 100 | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>        |        |  |     |      |      |      |
|                     | QUBE5  | <i>Quercus berberidifolia</i>                  | 100 | 24.0 | 24.0 | 24.0 |
|                     | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i> | 100 | 24.0 | 24.0 | 24.0 |
|                     | ADFA   | <i>Adenostoma fasciculatum</i>                 | 100 | 8.0  | 8.0  | 8.0  |
|                     | TODI   | <i>Toxicodendron diversilobum</i>              | 100 | 6.0  | 6.0  | 6.0  |
|                     | ARCA5  | <i>Arctostaphylos canescens</i>                | 100 | 4.0  | 4.0  | 4.0  |
|                     | BAPI   | <i>Baccharis pilularis</i>                     | 100 | 2.0  | 2.0  | 2.0  |
|                     | LOHI2  | <i>Lonicera hispidula</i>                      | 100 | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |  |     |      |      |      |
|                     | 2LICHN | Lichen   | 100 | 7.0  | 7.0  | 7.0  |
|                     | 2MOSS  | Moss   | 100 | 4.0  | 4.0  | 4.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

## ***Quercus berberidifolia* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (1), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 45.7                | 42–49                | –                 |
| <b>Herb</b>                          | 6.7                 | 2–16                 | <0.5–0.5          |
| <b>Shrub</b>                         | 39.0                | 35–42                | 0.5–5             |
| <b>Regenerating/understory tree*</b> | 3.4                 | 0–10                 | 2–35              |
| <b>Hardwood</b>                      | 0.1                 | 0–0.2                | 2–5               |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** NW (2), SW (1)

**Macrotopography:** middle 1/3 of slope to ridgetop (1), middle to upper 1/3 of slope (1), ridge top (1)

**Microtopography:** convex (3)

**Parent material:** Franciscan melange (3)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** moderate/6–25° (3)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 1697 ft.    | 777–2691 ft. |
| <b>Slope</b>             | 19.0°       | 18–20°       |
| <b>Large rock cover</b>  | 0.3%        | 0–1%         |
| <b>Small rock cover</b>  | 17.4%       | 3–41%        |
| <b>Bare ground cover</b> | 25.3%       | 20–32%       |
| <b>Litter cover</b>      | 54.3%       | 32–68%       |

### **Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0138, SONO0524, SONO0615

**Relevés:** none

**SCV Global/State Rank:** G4/S4<sup>1</sup>

### **STAND TABLE**

#### ***Quercus berberidifolia* Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>      | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|----------------------------|------------|------------|------------|------------|
| <b>Tree</b>     | QUERC       | <i>Quercus</i>             | 33         | 0.2        | 0.2        | 0.2        |
|                 | QUCH2       | <i>Quercus chrysolepis</i> | 33         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus berberidifolia* Association**

n = 3

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            | UMCA        | * <i>Umbellularia californica</i>                    | 33         | 0.2        | 0.2        | 0.2        |
| <b>Regenerating or Understory Tree</b> | UMCA        | * <i>Umbellularia californica</i>                    | 67         | 1.7        | 0.2        | 3.2        |
|  | QUPAS2      | <i>Quercus parvula</i> var. <i>shrevei</i>           | 33         | 7.2        | 7.2        | 7.2        |
|  | ARME        | <i>Arbutus menziesii</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|  | PSME        | <i>Pseudotsuga menziesii</i>                         | 33         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           | QUBE5       | <i>Quercus berberidifolia</i>                        | 100        | 37.7       | 35.0       | 40.0       |
|  | DIAUA       | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>  | 67         | 1.1        | 0.2        | 2.0        |
|  | LOHI2       | <i>Lonicera hispidula</i>                            | 67         | 0.6        | 0.2        | 1.0        |
|  | TODI        | <i>Toxicodendron diversilobum</i>                    | 33         | 2.0        | 2.0        | 2.0        |
|  | ARGL3       | <i>Arctostaphylos glandulosa</i>                     | 33         | 0.2        | 0.2        | 0.2        |
|  | ARVI4       | <i>Arctostaphylos viscida</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|  | BAPI        | <i>Baccharis pilularis</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|  | CECU        | <i>Ceanothus cuneatus</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|  | FRCA12      | <i>Frangula californica</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|  | GAFR        | <i>Garrya fremontii</i>                              | 33         | 0.2        | 0.2        | 0.2        |
|  | HEAR5       | <i>Heteromeles arbutifolia</i>                       | 33         | 0.2        | 0.2        | 0.2        |
|  | LUAL4       | <i>Lupinus albifrons</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|  | ROSA5       | <i>Rosa</i>  | 33         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            | BRMA        | <i>Briza maxima</i>                                  | 33         | 10.0       | 10.0       | 10.0       |
|  | CYEC        | <i>Cynosurus echinatus</i>                           | 33         | 9.0        | 9.0        | 9.0        |
|  | BRDI3       | <i>Bromus diandrus</i>                               | 33         | 1.0        | 1.0        | 1.0        |
|  | WHMO        | <i>Whipplea modesta</i>                              | 33         | 1.0        | 1.0        | 1.0        |
|  | PETR7       | <i>Pentagramma triangularis</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|  | TORIL       | <i>Torilis</i>                                       | 33         | 0.2        | 0.2        | 0.2        |
|  | SHAR2       | <i>Sherardia arvensis</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|  | CEME2       | <i>Centaurea melitensis</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|  | SCAND       | <i>Scandix</i>                                       | 33         | 0.2        | 0.2        | 0.2        |
|  | VUMY        | <i>Vulpia myuros</i>                                 | 33         | 0.2        | 0.2        | 0.2        |
|  | SACR2       | <i>Sanicula crassicaulis</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|  | POMU        | <i>Polystichum munitum</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|  | POCA5       | <i>Polygala californica</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|  | PEDU2       | <i>Petrorhagia dubia</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|  | MELIC       | <i>Melica</i>  | 33         | 0.2        | 0.2        | 0.2        |
|  | LOGA2       | <i>Logfia gallica</i>                                | 33         | 0.2        | 0.2        | 0.2        |
|  | LAJEC       | <i>Lathyrus jepsonii</i> ssp. <i>californicus</i>    | 33         | 0.2        | 0.2        | 0.2        |
|  | GAPH2       | <i>Gastroidium phleoides</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|  | GAPO        | <i>Galium porrigens</i>                              | 33         | 0.2        | 0.2        | 0.2        |
|  | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 33         | 0.2        | 0.2        | 0.2        |
|  | BRDI2       | <i>Brachypodium distachyon</i>                       | 33         | 0.2        | 0.2        | 0.2        |
|  | AVBA        | <i>Avena barbata</i>                                 | 33         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus berberidifolia* Association**

n = 3

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>      | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|----------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                            |            |            |            |            |
|                     | BRMA3       | <i>Bromus madritensis</i>  | 33         | 0.2        | 0.2        | 0.2        |
|                     | ERCI6       | <i>Erodium cicutarium</i>  | 33         | 0.2        | 0.2        | 0.2        |
|                     | CRFL4       | <i>Cryptantha flaccida</i> | 33         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                            |            |            |            |            |
|                     | 2MOSS       | Moss                       | 67         | 8.5        | 4.0        | 13.0       |
|                     | 2LICHN      | Lichen                     | 33         | 0.2        | 0.2        | 0.2        |



***Quercus durata* Alliance**  
**Leather oak chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus durata* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos glandulosa*, *Arctostaphylos glauca*, *Arctostaphylos pungens*, *Arctostaphylos viscida*, *Ceanothus jepsonii*, *Cercocarpus montanus*, *Eriodictyon californicum*, *Fremontodendron californicum*, *Garrya congdonii*, *Heteromeles arbutifolia*, *Quercus berberidifolia*, *Quercus wislizeni*, and *Umbellularia californica*. Emergent trees may be present at low cover, including *Hesperocyparis macnabiana*, *Hesperocyparis sargentii*, *Juniperus californica*, *Pinus attenuata*, or *Pinus sabiniana*.

Stands of this alliance have high fidelity to serpentine or other ultramafic substrates (Alexander et al. 2007, Kruckeberg 1984), typically occupying mesic sites, including north-facing slopes. *Quercus durata* includes two varieties: var. *durata* and var. *gabrielensis*. This alliance mainly describes *Quercus durata* var. *durata*, which grows on serpentine substrates in the Coastal Ranges and the foothills of the Sierra Nevada. The southern variety, *Q. durata* var. *gabrielensis*, occupies barren gneiss-derived soils in the San Gabriel Mountains.

Sonoma County

*Quercus durata* stands in Sonoma County are entirely restricted to serpentine soils, as is common for this alliance throughout its range. The three associations of this alliance occupy different ecological settings: the *Quercus durata* – *Heteromeles arbutifolia* / *Umbellularia californica* Association is the most mesic and is found on northerly facing slopes; the most xeric is the relatively uncommon *Quercus durata* – *Adenostoma fasciculatum* Provisional Association. The most widespread *Quercus durata* association in the county is the *Quercus durata* – *Ceanothus jepsonii* Provisional Association. It is newly defined from the data in this project, but probably extends eastward and northward in the Inner North Coast Ranges on serpentine soils. Occasionally, individuals of *Quercus durata* occur as members of other chaparral alliances (e.g., *Q. wislizeni* (shrub) or *Q. berberidifolia* Alliance stands) growing on volcanic or metamorphic substrates.

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**Local Alliance Summary (n = 20)**

**Elevation:** 345–3152 ft, mean 1381 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2T2/S2

*Calochortus raichei*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

*Calystegia collina* ssp. *oxyphylla*

CA rare plant rank: 4.2

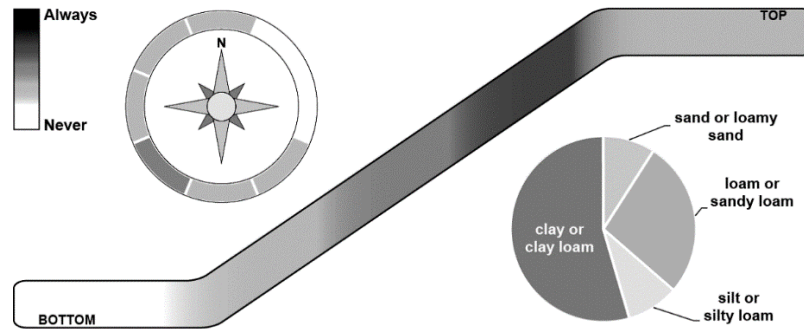
NatureServe global/state rank: G4T3/S3

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.9         | 18–80         | –          |
| <b>Herb</b>                          | 10.2         | 1–35          | <0.5–1     |
| <b>Shrub</b>                         | 42.8         | 6–72          | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 2.4          | 0–14          | 1–10       |
| <b>Hardwood</b>                      | 1.1          | 0–6           | 2–10       |
| <b>Conifer</b>                       | 1.2          | 0–9           | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 19.8° | 5–35° |
| <b>Large rock cover</b>  | 8.1%  | 0–32% |
| <b>Small rock cover</b>  | 29.7% | 4–55% |
| <b>Bare ground cover</b> | 27.5% | 2–60% |
| <b>Litter cover</b>      | 32.6% | 7–74% |

**Associations within this Alliance:**

- Quercus durata* – *Adenostoma fasciculatum* Provisional Association
- Quercus durata* – *Ceanothus jepsonii* Provisional Association
- Quercus durata* – *Heteromeles arbutifolia* / *Umbellularia californica* Association

**STAND TABLE**

***Quercus durata* Alliance**

n = 20

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|--|-------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 50  | 2.4  | 0.2 | 6.0  |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 20  | 0.6  | 0.2 | 1.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |     |      |
|  | UMCA  | * <i>Umbellularia californica</i> | 65  | 2.4  | 0.2 | 13.0 |
|  | PSME  | * <i>Pseudotsuga menziesii</i>    | 40  | 0.8  | 0.2 | 2.2  |
| <b>Shrub</b>                           |       |                                   |     |      |     |      |
|  | QUDU4 | <i>Quercus durata</i>             | 100 | 24.2 | 3.0 | 70.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus durata* Alliance**

n = 20

| Lifeform            | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|---------------------|--------|--|-----|------|-----|------|
| <b>Shrub</b>        |        |  |     |      |     |      |
|                     | HEAR5  | <i>Heteromeles arbutifolia</i>                       | 75  | 2.9  | 0.2 | 8.0  |
|                     | CEJE   | <i>Ceanothus jepsonii</i>                            | 60  | 11.5 | 0.2 | 33.0 |
|                     | ADFA   | <i>Adenostoma fasciculatum</i>                       | 55  | 10.6 | 0.2 | 30.0 |
|                     | ERCA6  | <i>Eriodictyon californicum</i>                      | 35  | 1.5  | 0.2 | 4.0  |
|                     | FRCA12 | * <i>Frangula californica</i>                        | 35  | 0.8  | 0.2 | 2.0  |
|                     | TODI   | <i>Toxicodendron diversilobum</i>                    | 30  | 1.4  | 0.2 | 3.0  |
|                     | FRCAT2 | * <i>Frangula californica</i> ssp. <i>tomentella</i> | 25  | 1.3  | 0.2 | 4.0  |
|                     | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>  | 25  | 0.7  | 0.2 | 1.0  |
| <b>Herb</b>         |        |  |     |      |     |      |
|                     | METO   | <i>Melica torreyana</i>                              | 45  | 2.4  | 0.1 | 10.0 |
|                     | VUMI   | <i>Vulpia microstachys</i>                           | 35  | 0.3  | 0.2 | 1.0  |
|                     | FECA   | <i>Festuca californica</i>                           | 25  | 2.3  | 0.2 | 7.0  |
|                     | ACMI2  | <i>Achillea millefolium</i>                          | 25  | 1.1  | 0.2 | 4.0  |
|                     | IRIS   | <i>Iris</i>  | 25  | 0.2  | 0.2 | 0.2  |
|                     | SIBE   | <i>Sisyrinchium bellum</i>                           | 20  | 0.7  | 0.2 | 2.0  |
|                     | ELMU3  | <i>Elymus multisetus</i>                             | 20  | 0.4  | 0.2 | 1.0  |
|                     | GALIU  | <i>Galium</i>  | 20  | 0.2  | 0.1 | 0.2  |
| <b>Non-vascular</b> |        |  |     |      |     |      |
|                     | 2MOSS  | Moss   | 50  | 1.2  | 0.2 | 6.0  |
|                     | 2LICHN | Lichen   | 35  | 1.0  | 0.2 | 3.0  |

**Noteworthy Taxa**

- Arctostaphylos bakeri* ssp. *sublaevis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2T2/S2
- Calochortus raichei*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2
- Calystegia collina* ssp. *oxyphylla*  
CA rare plant rank: 4.2  
NatureServe Global/State rank: G4T3/S3

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Quercus durata* – *Adenostoma fasciculatum* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 47.0         | 32–60         | –          |
| Herb             | 16.3         | 7–35          | <0.5–0.5   |

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Shrub                         | 36.7         | 29–43         | 1–5        |
| Regenerating/understory tree* | 0.1          | 0–0.2         | 1–5        |
| Hardwood                      | 2.3          | 1–4           | 5–10       |
| Conifer                       | 0.4          | 0–1           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (2)

**Macrotopography:** middle to upper 1/3 of slope (1), upper 1/3 of slope (2)

**Microtopography:** convex (2), undulating (1)

**Parent material:** serpentine (1), ultramafic (2)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1)

**Slope steepness:** moderate/6–25° (2), steep/>25° (1)

|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1046 ft. | 464–1607 ft. |
| Slope             | 18.0°    | 9–35°        |
| Large rock cover  | 0.5%     | 0–1%         |
| Small rock cover  | 34.1%    | 18–46%       |
| Bare ground cover | 30.0%    | 19–42%       |
| Litter cover      | 33.3%    | 10–60%       |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** MILOB021, SONO0837

**Relevés:** SONO0111

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Quercus durata* – *Adenostoma fasciculatum* Provisional Association**

n = 3

| Lifeform                        | Code  | Botanical Name                                      | Con | Avg  | Min | Max  |
|---------------------------------|-------|---|-----|------|-----|------|
| Tree                            | UMCA  | * <i>Umbellularia californica</i>                   | 100 | 1.3  | 1.0 | 2.0  |
|                                 | PSME  | * <i>Pseudotsuga menziesii</i>                      | 67  | 0.6  | 0.2 | 1.0  |
| Regenerating or Understory Tree | UMCA  | * <i>Umbellularia californica</i>                   | 100 | 0.5  | 0.2 | 1.0  |
|                                 | PSME  | * <i>Pseudotsuga menziesii</i>                      | 100 | 0.2  | 0.2 | 0.2  |
| Shrub                           | ADFA  | <i>Adenostoma fasciculatum</i>                      | 100 | 16.0 | 8.0 | 22.0 |
|                                 | QUDU4 | <i>Quercus durata</i>                               | 100 | 14.3 | 8.0 | 19.0 |
|                                 | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 100 | 1.7  | 0.2 | 4.0  |
|                                 | TODI  | <i>Toxicodendron diversilobum</i>                   | 67  | 2.0  | 1.0 | 3.0  |
|                                 | RHCR  | <i>Rhamnus crocea</i>                               | 67  | 1.6  | 0.2 | 3.0  |
|                                 | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 67  | 1.0  | 1.0 | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus durata* – *Adenostoma fasciculatum* Provisional Association**

n = 3

| Lifeform     | Code   | Botanical Name                                       | Con             | Avg | Min | Max |     |
|--------------|--------|--|-----------------|-----|-----|-----|-----|
| Shrub        | BAPI   | <i>Baccharis pilularis</i>                           | 67              | 0.6 | 0.2 | 1.0 |     |
|              | ARMA   | <i>Arctostaphylos manzanita</i>                      | 33              | 5.0 | 5.0 | 5.0 |     |
|              | LOHI2  | <i>Lonicera hispidula</i>                            | 33              | 2.0 | 2.0 | 2.0 |     |
|              | CEFOF3 | <i>Ceanothus foliosus</i> var. <i>foliosus</i>       | 33              | 1.0 | 1.0 | 1.0 |     |
|              | CECU   | <i>Ceanothus cuneatus</i>                            | 33              | 0.2 | 0.2 | 0.2 |     |
|              | FRCA12 | <i>Frangula californica</i>                          | 33              | 0.2 | 0.2 | 0.2 |     |
|              | HESC2  | <i>Helianthemum scoparium</i>                        | 33              | 0.2 | 0.2 | 0.2 |     |
|              | PIMOM  | <i>Pickeringia montana</i> var. <i>montana</i>       | 33              | 0.2 | 0.2 | 0.2 |     |
|              | Herb   | AGROS2   | <i>Agrostis</i> | 100 | 3.7 | 0.2 | 6.0 |
| ACMI2        |        | <i>Achillea millefolium</i>                          | 100             | 1.5 | 0.2 | 4.0 |     |
| HYCO3        |        | <i>Hypericum concinnum</i>                           | 67              | 0.6 | 0.2 | 1.0 |     |
| GALIU        |        | <i>Galium</i>  | 67              | 0.2 | 0.1 | 0.2 |     |
| CAPA6        |        | <i>Calycadenia pauciflora</i>                        | 33              | 8.0 | 8.0 | 8.0 |     |
| BRHO2        |        | <i>Bromus hordeaceus</i>                             | 33              | 5.0 | 5.0 | 5.0 |     |
| PLER3        |        | <i>Plantago erecta</i>                               | 33              | 3.0 | 3.0 | 3.0 |     |
| CACO35       |        | <i>Calystegia collina</i>                            | 33              | 2.0 | 2.0 | 2.0 |     |
| CORDY        |        | <i>Cordylanthus</i>                                  | 33              | 1.0 | 1.0 | 1.0 |     |
| FEID         |        | <i>Festuca idahoensis</i>                            | 33              | 1.0 | 1.0 | 1.0 |     |
| IRMA         |        | <i>Iris macrosiphon</i>                              | 33              | 1.0 | 1.0 | 1.0 |     |
| LOHU2        |        | <i>Lotus humistratus</i>                             | 33              | 1.0 | 1.0 | 1.0 |     |
| MOVIV        |        | <i>Monardella villosa</i> ssp. <i>villosa</i>        | 33              | 1.0 | 1.0 | 1.0 |     |
| ERIOP2       |        | <i>Eriophyllum</i>                                   | 33              | 0.2 | 0.2 | 0.2 |     |
| POLYG        |        | <i>Polygala</i>                                      | 33              | 0.2 | 0.2 | 0.2 |     |
| NALE2        |        | <i>Nassella lepida</i>                               | 33              | 0.2 | 0.2 | 0.2 |     |
| MOVI3        |        | <i>Monardella viridis</i>                            | 33              | 0.2 | 0.2 | 0.2 |     |
| MONAR2       |        | <i>Monardella</i>                                    | 33              | 0.2 | 0.2 | 0.2 |     |
| LOMI         |        | <i>Lotus micranthus</i>                              | 33              | 0.2 | 0.2 | 0.2 |     |
| LEJE         |        | <i>Leptosiphon jepsonii</i>                          | 33              | 0.2 | 0.2 | 0.2 |     |
| IRIS         |        | <i>Iris</i>  | 33              | 0.2 | 0.2 | 0.2 |     |
| FECA         |        | <i>Festuca californica</i>                           | 33              | 0.2 | 0.2 | 0.2 |     |
| ERNUA        |        | <i>Eriogonum nudum</i> var. <i>auriculatum</i>       | 33              | 0.2 | 0.2 | 0.2 |     |
| ELGL         |        | <i>Elymus glaucus</i>                                | 33              | 0.2 | 0.2 | 0.2 |     |
| DICAC5       |        | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 33              | 0.2 | 0.2 | 0.2 |     |
| CAOP2        |        | <i>Calamagrostis ophitidis</i>                       | 33              | 0.2 | 0.2 | 0.2 |     |
| GAPH2        |        | <i>Gastroidium phleoides</i>                         | 33              | 0.2 | 0.2 | 0.2 |     |
| METO         |        | <i>Melica torreyana</i>                              | 33              | 0.1 | 0.1 | 0.1 |     |
| ZIGAD        |        | <i>Zigadenus</i>                                     | 33              | 0.1 | 0.1 | 0.1 |     |
| Non-vascular |        | 2MOSS  | Moss            | 67  | 0.2 | 0.2 | 0.2 |
|              |        | 2LICHN   | Lichen          | 33  | 0.2 | 0.2 | 0.2 |

**Noteworthy Taxa**

*Calystegia collina* ssp. *oxyphylla*

CA rare plant rank: 4.2

NatureServe Global/State rank: G4T3/S3

***Quercus durata* – *Ceanothus jepsonii* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (5), Coastal Franciscan/263Ag (5), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.8         | 30–80         | –          |
| <b>Herb</b>                          | 8.9          | 1–25          | <0.5–1     |
| <b>Shrub</b>                         | 41.8         | 15–65         | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 1.7          | 0–7           | 1–10       |
| <b>Hardwood</b>                      | 0.1          | 0–1           | 2–10       |
| <b>Conifer</b>                       | 1.9          | 0–9           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (3), SW (5), variable (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), middle to upper 1/3 of slope (2), ridge top (1), upper 1/3 of slope (3), upper 1/3 of slope to ridgetop (3)

**Microtopography:** concave (1), convex (5), flat (1), undulating (4)

**Parent material:** Franciscan melange (2), serpentine (9)

**Soil texture:** clay or clay loam (3), loam or sandy loam (1), sand (1), silt or silt loam (1)

**Slope steepness:** moderate/6–25° (9), steep/>25° (2)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1495 ft. | 708–3152 ft. |
| <b>Slope</b>             | 19.2°    | 8–31°        |
| <b>Large rock cover</b>  | 8.4%     | 0–25%        |
| <b>Small rock cover</b>  | 30.1%    | 4–55%        |
| <b>Bare ground cover</b> | 30.5%    | 4–60%        |
| <b>Litter cover</b>      | 28.7%    | 7–74%        |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** SERP0013, SONO0090, SONO0133, SONO0275, SONO0285, SONO0353, SONO0586, SONO0653, SONO0694, SONO2026, SONO2203

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

**Quercus durata – Ceanothus jepsonii Provisional Association**

n = 12

| Lifeform                               | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|--|--------|--|-----|------|-----|------|
| <b>Tree</b>                            |        |  |     |      |     |      |
|  | UMCA   | * <i>Umbellularia californica</i>                    | 33  | 3.3  | 0.2 | 6.0  |
|  | PISA2  | <i>Pinus sabiniana</i>                               | 25  | 5.0  | 3.0 | 9.0  |
|  | PIAT   | <i>Pinus attenuata</i>                               | 25  | 4.1  | 0.2 | 7.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |     |      |
|  | UMCA   | * <i>Umbellularia californica</i>                    | 50  | 1.1  | 0.2 | 3.2  |
| <b>Shrub</b>                           |        |  |     |      |     |      |
|  | QUDU4  | <i>Quercus durata</i>                                | 100 | 24.3 | 3.0 | 58.0 |
|  | CEJE   | <i>Ceanothus jepsonii</i>                            | 100 | 11.5 | 0.2 | 33.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                       | 75  | 3.3  | 1.0 | 8.0  |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                       | 42  | 12.4 | 1.0 | 30.0 |
|  | ERCA6  | <i>Eriodictyon californicum</i>                      | 42  | 1.9  | 0.2 | 4.0  |
|  | FRCAT2 | * <i>Frangula californica</i> ssp. <i>tomentella</i> | 42  | 1.3  | 0.2 | 4.0  |
|  | FRCA12 | * <i>Frangula californica</i>                        | 25  | 1.3  | 1.0 | 2.0  |
| <b>Herb</b>                            |        |  |     |      |     |      |
|  | METO   | <i>Melica torreyana</i>                              | 50  | 3.4  | 0.2 | 10.0 |
|  | VUMI   | <i>Vulpia microstachys</i>                           | 33  | 0.4  | 0.2 | 1.0  |
|  | SIBE   | <i>Sisyrinchium bellum</i>                           | 25  | 0.8  | 0.2 | 2.0  |
|  | ELMU3  | <i>Elymus multisetus</i>                             | 25  | 0.5  | 0.2 | 1.0  |
| <b>Non-vascular</b>                    |        |  |     |      |     |      |
|  | 2MOSS  | Moss   | 50  | 1.4  | 0.2 | 6.0  |
|  | 2LICHN | Lichen   | 25  | 0.8  | 0.2 | 2.0  |

**Noteworthy Taxa**

- Arctostaphylos bakeri* ssp. *sublaevis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2T2/S2
- Calochortus raichei*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Quercus durata – Heteromeles arbutifolia / Umbellularia californica Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (1), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 49.0         | 18–80         | –          |
| <b>Herb</b>             | 10.3         | 5–16          | <0.5–1     |
| <b>Shrub</b>            | 40.0         | 6–72          | 1–2        |

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 6.5          | 4–14          | 2–5        |
| <b>Hardwood</b>                      | 1.6          | 0–6           | 2–5        |
| <b>Conifer</b>                       | 0.6          | 0–2           | 2–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2), SW (2)

**Macrotopography:** middle 1/3 of slope (2), upper 1/3 of slope (2)

**Microtopography:** convex (3), undulating (1)

**Parent material:** Franciscan melange (1), serpentine (3)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2), steep/>25° (1)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1305 ft. | 345–1779 ft. |
| <b>Slope</b>             | 18.3°    | 5–30°        |
| <b>Large rock cover</b>  | 8.8%     | 5–14%        |
| <b>Small rock cover</b>  | 22.8%    | 6–40%        |
| <b>Bare ground cover</b> | 25.0%    | 3–45%        |
| <b>Litter cover</b>      | 41.3%    | 10–74%       |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0528, SONO0662, SONO0688

**Relevés:** SONO0009

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Quercus durata* – *Heteromeles arbutifolia* / *Umbellularia californica* Association**

n = 4

| Lifeform                               | Code   | Botanical Name                    | Con | Avg  | Min | Max  |
|--|--------|-----------------------------------|-----|------|-----|------|
| <b>Tree</b>                            |        |                                   |     |      |     |      |
|  | UMCA   | * <i>Umbellularia californica</i> | 75  | 2.1  | 0.2 | 6.0  |
|  | QUAG   | * <i>Quercus agrifolia</i>        | 50  | 1.1  | 0.2 | 2.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 50  | 0.6  | 0.2 | 1.0  |
|  | HESA17 | <i>Hesperocyparis sargentii</i>   | 25  | 1.0  | 1.0 | 1.0  |
|  | ARME   | * <i>Arbutus menziesii</i>        | 25  | 0.2  | 0.2 | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |      |     |      |
|  | UMCA   | * <i>Umbellularia californica</i> | 100 | 5.6  | 2.2 | 13.0 |
|  | PSME   | * <i>Pseudotsuga menziesii</i>    | 75  | 1.2  | 0.4 | 2.2  |
|  | QUAG   | * <i>Quercus agrifolia</i>        | 50  | 0.3  | 0.2 | 0.4  |
|  | ARME   | * <i>Arbutus menziesii</i>        | 25  | 0.2  | 0.2 | 0.2  |
| <b>Shrub</b>                           |        |                                   |     |      |     |      |
|  | QUDU4  | <i>Quercus durata</i>             | 100 | 31.0 | 5.0 | 70.0 |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>    | 75  | 2.7  | 0.2 | 7.0  |

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¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**STAND TABLE** continued

***Quercus durata* – *Heteromeles arbutifolia* / *Umbellularia californica* Association**

n = 4

| Lifeform | Code   | Botanical Name  | Con                        | Avg  | Min  | Max  |
|----------|--------|---|----------------------------|------|------|------|
| Shrub    | TODI   | <i>Toxicodendron diversilobum</i>                     | 50                         | 2.0  | 1.0  | 3.0  |
|          | ADFA   | <i>Adenostoma fasciculatum</i>                        | 50                         | 1.1  | 0.2  | 2.0  |
|          | FRCA12 | <i>Frangula californica</i>                           | 50                         | 0.2  | 0.2  | 0.2  |
|          | ARCA5  | <i>Arctostaphylos canescens</i>                       | 25                         | 16.0 | 16.0 | 16.0 |
|          | ARMA   | <i>Arctostaphylos manzanita</i>                       | 25                         | 4.0  | 4.0  | 4.0  |
|          | CEANO  | <i>Ceanothus</i>                                      | 25                         | 2.0  | 2.0  | 2.0  |
|          | CEGLE  | <i>Ceanothus gloriosus</i> var. <i>exaltatus</i>      | 25                         | 1.0  | 1.0  | 1.0  |
|          | ARCTO3 | <i>Arctostaphylos</i>                                 | 25                         | 1.0  | 1.0  | 1.0  |
|          | CECU   | <i>Ceanothus cuneatus</i>                             | 25                         | 0.2  | 0.2  | 0.2  |
|          | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>   | 25                         | 0.2  | 0.2  | 0.2  |
|          | ERAR27 | <i>Ericameria arborescens</i>                         | 25                         | 0.2  | 0.2  | 0.2  |
|          | ERCA6  | <i>Eriodictyon californicum</i>                       | 25                         | 0.2  | 0.2  | 0.2  |
|          | GAEL   | <i>Garrya elliptica</i>                               | 25                         | 0.2  | 0.2  | 0.2  |
|          | PHVI9  | <i>Phoradendron villosum</i>                          | 25                         | 0.2  | 0.2  | 0.2  |
|          | Herb   | VUMI  | <i>Vulpia microstachys</i> | 75   | 0.2  | 0.2  |
| FECA     |        | <i>Festuca californica</i>                            | 50                         | 1.6  | 0.2  | 3.0  |
| METO     |        | <i>Melica torreyana</i>                               | 50                         | 0.6  | 0.2  | 1.0  |
| IRIS     |        | <i>Iris</i>   | 50                         | 0.2  | 0.2  | 0.2  |
| CAOP2    |        | <i>Calamagrostis ophitidis</i>                        | 25                         | 10.0 | 10.0 | 10.0 |
| AVBA     |        | <i>Avena barbata</i>                                  | 25                         | 1.0  | 1.0  | 1.0  |
| BRHO2    |        | <i>Bromus hordeaceus</i>                              | 25                         | 1.0  | 1.0  | 1.0  |
| CLEXE2   |        | <i>Claytonia exigua</i> ssp. <i>exigua</i>            | 25                         | 0.2  | 0.2  | 0.2  |
| GACAC    |        | <i>Galium californicum</i> ssp. <i>californicum</i>   | 25                         | 0.2  | 0.2  | 0.2  |
| FRITI    |        | <i>Fritillaria</i>                                    | 25                         | 0.2  | 0.2  | 0.2  |
| ERLAA3   |        | * <i>Eriophyllum lanatum</i> var. <i>arachnoideum</i> | 25                         | 0.2  | 0.2  | 0.2  |
| ERLA6    |        | * <i>Eriophyllum lanatum</i>                          | 25                         | 0.2  | 0.2  | 0.2  |
| EPMI     |        | <i>Epilobium minutum</i>                              | 25                         | 0.2  | 0.2  | 0.2  |
| ELMU3    |        | <i>Elymus multisetus</i>                              | 25                         | 0.2  | 0.2  | 0.2  |
| ACMI2    |        | <i>Achillea millefolium</i>                           | 25                         | 0.2  | 0.2  | 0.2  |
| ELELC2   |        | <i>Elymus elymoides</i> ssp. <i>californicus</i>      | 25                         | 0.2  | 0.2  | 0.2  |
| HECOL3   |        | * <i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>   | 25                         | 0.2  | 0.2  | 0.2  |
| CHPO3    |        | <i>Chlorogalum pomeridianum</i>                       | 25                         | 0.2  | 0.2  | 0.2  |
| CALYS    |        | <i>Calystegia</i>                                     | 25                         | 0.2  | 0.2  | 0.2  |
| CAAM3    |        | <i>Calochortus amabilis</i>                           | 25                         | 0.2  | 0.2  | 0.2  |
| CALAM    |        | <i>Calamagrostis</i>                                  | 25                         | 0.2  | 0.2  | 0.2  |
| BRTE     |        | <i>Bromus tectorum</i>                                | 25                         | 0.2  | 0.2  | 0.2  |
| BRCA5    |        | <i>Bromus carinatus</i>                               | 25                         | 0.2  | 0.2  | 0.2  |
| BROMU    |        | <i>Bromus</i>   | 25                         | 0.2  | 0.2  | 0.2  |
| ELGL     |        | <i>Elymus glaucus</i>                                 | 25                         | 0.2  | 0.2  | 0.2  |
| MOVIV    |        | <i>Monardella villosa</i> ssp. <i>villosa</i>         | 25                         | 0.2  | 0.2  | 0.2  |
| VUBR     |        | <i>Vulpia bromoides</i>                               | 25                         | 0.2  | 0.2  | 0.2  |
| VIOC     |        | <i>Viola ocellata</i>                                 | 25                         | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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**STAND TABLE** continued

***Quercus durata* – *Heteromeles arbutifolia* / *Umbellularia californica* Association**

n = 4

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                 |            |            |            |            |
|                     | VICIA       | <i>Vicia</i>                    | 25         | 0.2        | 0.2        | 0.2        |
|                     | TRHI4       | <i>Trifolium hirtum</i>         | 25         | 0.2        | 0.2        | 0.2        |
|                     | SIBE        | <i>Sisyrinchium bellum</i>      | 25         | 0.2        | 0.2        | 0.2        |
|                     | SISYR       | <i>Sisyrinchium</i>             | 25         | 0.2        | 0.2        | 0.2        |
|                     | RACA2       | <i>Ranunculus californicus</i>  | 25         | 0.2        | 0.2        | 0.2        |
|                     | GAPH2       | <i>Gastrium phleoides</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                     | NASSE       | <i>Nassella</i>                 | 25         | 0.2        | 0.2        | 0.2        |
|                     | HECO7       | * <i>Hemizonia congesta</i>     | 25         | 0.2        | 0.2        | 0.2        |
|                     | MONAR2      | <i>Monardella</i>               | 25         | 0.2        | 0.2        | 0.2        |
|                     | LOTUS       | <i>Lotus</i>                    | 25         | 0.2        | 0.2        | 0.2        |
|                     | LOUT        | <i>Lomatium utriculatum</i>     | 25         | 0.2        | 0.2        | 0.2        |
|                     | LOCA19      | <i>Logfia californica</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                     | LERA3       | <i>Lessingia ramulosa</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                     | IRFE        | <i>Iris fernaldii</i>           | 25         | 0.2        | 0.2        | 0.2        |
|                     | HYCO3       | <i>Hypericum concinnum</i>      | 25         | 0.2        | 0.2        | 0.2        |
|                     | PETR7       | <i>Pentagramma triangularis</i> | 25         | 0.2        | 0.2        | 0.2        |
|                     | ASCA5       | <i>Aspidotis californica</i>    | 25         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                                 |            |            |            |            |
|                     | 2LICHN      | Lichen                          | 50         | 2.0        | 1.0        | 3.0        |
|                     | 2MOSS       | Moss                            | 50         | 1.5        | 1.0        | 2.0        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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## ***Quercus wislizeni* (shrub) Alliance**

### **Interior live oak chaparral**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Quercus wislizeni* is dominant or co-dominant in the shrub canopy with *Adenostoma fasciculatum*, *Arctostaphylos glandulosa*, *Arctostaphylos glauca*, *Ceanothus cuneatus*, *Ceanothus leucodermis*, *Ceanothus oliganthus*, *Cercocarpus montanus*, *Frangula californica*, *Hesperoyucca whipplei*, *Heteromeles arbutifolia*, *Prunus ilicifolia*, *Quercus berberidifolia*, *Quercus chrysolepis*, *Rhamnus ilicifolia*, and *Toxicodendron diversilobum*. Emergent trees may be present at low cover, including *Aesculus californica*, *Juniperus californica*, *Pinus attenuata*, *Pinus coulteri*, or *Pinus sabiniana*.

*Quercus wislizeni* is a widespread and common species in shrublands, forests, and woodlands of the state. The shrubby stands included in this alliance may represent the distinct *Quercus wislizeni* var. *frutescens* or *Q. wislizeni* trees affected by age-related limited height growth or fire regime. White and Sawyer (1995) consider many southern California *Quercus wislizeni* shrublands to be the result of frequent resprouting after fires.

#### Sonoma County

The general distribution of *Quercus wislizeni* (tree) and *Q. wislizeni* (shrub) Alliance stands tend to overlap in Sonoma County. All stands occur inland at least 15 km from the coast, and stands of both tree and shrub forms have often been observed to be adjacent to one another – the tree stands lying on lower, protected slopes and the shrub stands on middle to upper slopes. In addition, there is commonly a high species overlap between the tree and shrub forms of these alliances. This suggests, as noted elsewhere in the state, that the distinction between the tree and shrub lifeforms is likely driven by moisture, soil penetrability, and fire frequency, and may not have a strong genetic component. Stands without widespread evidence of tall (> 5 m), recently burned *Quercus wislizeni* snags are currently the ones most reliably assigned to the shrub alliance. Long-term monitoring or retrospective mapping from older imagery may shed light on the question of whether these two lifeform-based alliances should remain separate.

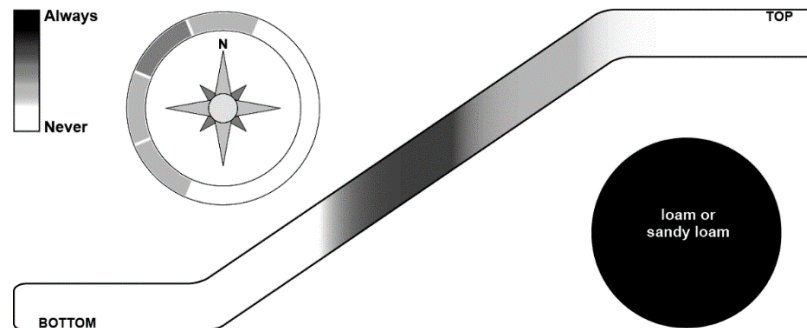
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#### **Local Alliance Summary (n = 6)**

**Elevation:** 530–3209 ft, mean 2262 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 53.0         | 40–66         | –          |
| <b>Herb</b>                          | 3.0          | 0–6           | <0.5–1     |
| <b>Shrub</b>                         | 48.3         | 35–61         | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.3          | 0.2–5         | 1–5        |
| <b>Hardwood</b>                      | 3.3          | 0–9           | 2–10       |
| <b>Conifer</b>                       | 1.4          | 0–7           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 23.2° | 6–32°  |
| <b>Large rock cover</b>  | 1.5%  | 0–4%   |
| <b>Small rock cover</b>  | 14.8% | 0–30%  |
| <b>Bare ground cover</b> | 30.5% | 15–60% |
| <b>Litter cover</b>      | 50.5% | 36–72% |

**Associations within this Alliance:**

*Quercus wislizeni* – *Ceanothus oliganthus* Provisional Association

*Quercus wislizeni* var. *frutescens* Provisional Association

**STAND TABLE**

***Quercus wislizeni* (shrub) Alliance**

n = 6

| Lifeform                               | Code  | Botanical Name                                  | Con | Avg  | Min  | Max  |
|--|-------|---|-----|------|------|------|
| <b>Tree</b>                            |       |   |     |      |      |      |
|  | QUCH2 | <i>Quercus chrysolepis</i>                      | 50  | 3.3  | 1.0  | 7.0  |
|  | UMCA  | * <i>Umbellularia californica</i>               | 50  | 2.7  | 0.2  | 6.0  |
|  | PISA2 | <i>Pinus sabiniana</i>                          | 33  | 0.6  | 0.2  | 1.0  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |      |      |
|  | PIAT  | <i>Pinus attenuata</i>                          | 33  | 2.7  | 0.4  | 5.0  |
|  | UMCA  | * <i>Umbellularia californica</i>               | 33  | 1.6  | 0.2  | 3.0  |
|  | ARME  | <i>Arbutus menziesii</i>                        | 33  | 0.6  | 0.2  | 1.0  |
| <b>Shrub</b>                           |       |   |     |      |      |      |
|  | QUWIF | <i>Quercus wislizeni</i> var. <i>frutescens</i> | 100 | 19.7 | 16.0 | 25.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i>               | 83  | 1.4  | 0.2  | 3.0  |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                  | 67  | 6.5  | 2.0  | 12.0 |
|  | QUDU4 | <i>Quercus durata</i>                           | 67  | 3.8  | 2.0  | 8.0  |
|  | LOHI2 | <i>Lonicera hispidula</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|  | CEOL  | <i>Ceanothus oliganthus</i>                     | 33  | 19.5 | 14.0 | 25.0 |
|  | ARMA  | <i>Arctostaphylos manzanita</i>                 | 33  | 15.5 | 1.0  | 30.0 |
|  | CECU  | <i>Ceanothus cuneatus</i>                       | 33  | 9.0  | 4.0  | 14.0 |
|  | CEMOG | <i>Cercocarpus montanus</i> var. <i>glaber</i>  | 33  | 6.0  | 6.0  | 6.0  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                  | 33  | 4.5  | 4.0  | 5.0  |
|  | GAFR  | <i>Garrya fremontii</i>                         | 33  | 4.0  | 4.0  | 4.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Quercus wislizeni* (shrub) Alliance**

n = 6

| Lifeform     | Code   | Botanical Name                | Con | Avg | Min | Max |
|--------------|--------|-------------------------------|-----|-----|-----|-----|
| Herb         | VUMY   | <i>Vulpia myuros</i>          | 33  | 0.6 | 0.2 | 1.0 |
|              | CESO3  | <i>Centaurea solstitialis</i> | 33  | 0.2 | 0.2 | 0.2 |
| Non-vascular |        |                               |     |     |     |     |
|              | 2LICHN | Lichen                        | 33  | 0.2 | 0.2 | 0.2 |
|              | 2MOSS  | Moss                          | 33  | 0.2 | 0.2 | 0.2 |

***Quercus wislizeni* – *Ceanothus oliganthus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.0         | 45–65         | –          |
| <b>Herb</b>                          | 4.0          | 3–5           | <0.5–1     |
| <b>Shrub</b>                         | 49.5         | 39–60         | 2–5        |
| <b>Regenerating/understory tree*</b> | 2.1          | 0.2–4         | 1–5        |
| <b>Hardwood</b>                      | 4.5          | 0–9           | 2–5        |
| <b>Conifer</b>                       | 0.2          | 0–0.2         | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1)  
**Macrotopography:** middle 1/3 of slope (2)  
**Microtopography:** concave (1), flat (1)  
**Parent material:** Franciscan melange (2)  
**Soil texture:** loam or sandy loam (1)  
**Slope steepness:** moderate/6-25° (2)

|                          | Mean     | Range         |
|--------------------------|----------|---------------|
| <b>Elevation</b>         | 2632 ft. | 2240–3024 ft. |
| <b>Slope</b>             | 15.5°    | 6–25°         |
| <b>Large rock cover</b>  | 2.3%     | 0–4%          |
| <b>Small rock cover</b>  | 23.1%    | 20–26%        |
| <b>Bare ground cover</b> | 21.5%    | 20–23%        |
| <b>Litter cover</b>      | 49.5%    | 44–55%        |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0127, SONO0247  
**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Quercus wislizeni* – *Ceanothus oliganthus* Provisional Association**

n = 2

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | QUCH2  | <i>Quercus chrysolepis</i>                                | 50  | 7.0  | 7.0  | 7.0  |
|  | UMCA   | <i>Umbellularia californica</i>                           | 50  | 2.0  | 2.0  | 2.0  |
|  | 2SNAG  | * Standing snag   | 50  | 0.2  | 0.2  | 0.2  |
|  | PISA2  | * <i>Pinus sabiniana</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|  | PIAT   | * <i>Pinus attenuata</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | PIAT   | * <i>Pinus attenuata</i>                                  | 100 | 2.7  | 0.4  | 5.0  |
|  | 2SNAG  | * Standing snag   | 50  | 2.0  | 2.0  | 2.0  |
|  | QUGA4  | <i>Quercus garryana</i>                                   | 50  | 0.2  | 0.2  | 0.2  |
|  | PISA2  | * <i>Pinus sabiniana</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|  | ARME   | <i>Arbutus menziesii</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | CEOL   | <i>Ceanothus oliganthus</i>                               | 100 | 19.5 | 14.0 | 25.0 |
|  | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>           | 100 | 16.0 | 16.0 | 16.0 |
|  | QUDU4  | <i>Quercus durata</i>                                     | 100 | 2.5  | 2.0  | 3.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                         | 100 | 2.5  | 2.0  | 3.0  |
|  | CECU   | <i>Ceanothus cuneatus</i>                                 | 50  | 14.0 | 14.0 | 14.0 |
|  | GAFR   | <i>Garrya fremontii</i>                                   | 50  | 4.0  | 4.0  | 4.0  |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                            | 50  | 2.0  | 2.0  | 2.0  |
|  | ARMA   | * <i>Arctostaphylos manzanita</i>                         | 50  | 1.0  | 1.0  | 1.0  |
|  | ARGL3  | <i>Arctostaphylos glandulosa</i>                          | 50  | 1.0  | 1.0  | 1.0  |
|  | ARMAG  | * <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | ARST   | <i>Arctostaphylos stanfordiana</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|  | LOHI2  | <i>Lonicera hispidula</i>                                 | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | ELGL   | <i>Elymus glaucus</i>                                     | 50  | 2.0  | 2.0  | 2.0  |
|  | GALIU  | <i>Galium</i>   | 50  | 1.0  | 1.0  | 1.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|  | MELIC  | <i>Melica</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | HYCO3  | <i>Hypericum concinnum</i>                                | 50  | 0.2  | 0.2  | 0.2  |
|  | ERLA6  | <i>Eriophyllum lanatum</i>                                | 50  | 0.2  | 0.2  | 0.2  |
|  | ERIGE2 | <i>Erigeron</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | CYEC   | <i>Cynosurus echinatus</i>                                | 50  | 0.2  | 0.2  | 0.2  |
|  | CESO3  | <i>Centaurea solstitialis</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|  | VUMY   | <i>Vulpia myuros</i>                                      | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2LICHN | Lichen  | 50  | 0.2  | 0.2  | 0.2  |
|  | 2MOSS  | Moss  | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Quercus wislizeni var. frutescens Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) and Coastal Franciscan/263Ag (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 52.0         | 40–66         | –          |
| <b>Herb</b>                          | 2.6          | 0–6           | <0.5–0.5   |
| <b>Shrub</b>                         | 47.8         | 35–61         | 1–5        |
| <b>Regenerating/understory tree*</b> | 2.4          | 0.2–5         | 2–5        |
| <b>Hardwood</b>                      | 2.8          | 0–6           | 2–10       |
| <b>Conifer</b>                       | 2.0          | 0–7           | 5–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SW (2)

**Macrotopography:** middle 1/3 of slope (2), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (1), convex (2), flat (1)

**Parent material:** Franciscan melange (1), metamorphic (1), sandstone (1), serpentine (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (1), steep/>25° (2)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 2077 ft. | 530–3209 ft. |
| <b>Slope</b>             | 28.3°    | 21–32°       |
| <b>Large rock cover</b>  | 1.1%     | 0–4%         |
| <b>Small rock cover</b>  | 10.6%    | 0–30%        |
| <b>Bare ground cover</b> | 35.0%    | 15–60%       |
| <b>Litter cover</b>      | 51.0%    | 36–72%       |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0048, SONO0131, SONO0816, SONO0941

**Relevés:** none

**SCV Global/State Rank:** G3G4?/S3S4?¹

**STAND TABLE**

**Quercus wislizeni var. frutescens Provisional Association**

n = 4

| Lifeform | Code  | Botanical Name                    | Con | Avg | Min | Max |
|----------|-------|-----------------------------------|-----|-----|-----|-----|
| Tree     | UMCA  | * <i>Umbellularia californica</i> | 50  | 3.1 | 0.2 | 6.0 |
|          | QUCH2 | <i>Quercus chrysolepis</i>        | 50  | 1.5 | 1.0 | 2.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Quercus wislizeni* var. *frutescens* Provisional Association**

n = 4

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                          | 25  | 4.0  | 4.0  | 4.0  |
|  | PILA   | <i>Pinus lambertiana</i>                                | 25  | 3.0  | 3.0  | 3.0  |
|  | ARME   | * <i>Arbutus menziesii</i>                              | 25  | 2.0  | 2.0  | 2.0  |
|  | PISA2  | <i>Pinus sabiniana</i>                                  | 25  | 1.0  | 1.0  | 1.0  |
|  | QUKE   | <i>Quercus kelloggii</i>                                | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | UMCA   | * <i>Umbellularia californica</i>                       | 50  | 1.6  | 0.2  | 3.0  |
|  | PSME   | * <i>Pseudotsuga menziesii</i>                          | 25  | 5.2  | 5.2  | 5.2  |
|  | ARME   | * <i>Arbutus menziesii</i>                              | 25  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | QUWIF  | <i>Quercus wislizeni</i> var. <i>frutescens</i>         | 100 | 21.5 | 16.0 | 25.0 |
|  | ADFA   | <i>Adenostoma fasciculatum</i>                          | 75  | 8.0  | 4.0  | 12.0 |
|  | TODI   | <i>Toxicodendron diversilobum</i>                       | 75  | 0.7  | 0.2  | 1.0  |
|  | CEMOG  | <i>Cercocarpus montanus</i> var. <i>glaber</i>          | 50  | 6.0  | 6.0  | 6.0  |
|  | QUDU4  | <i>Quercus durata</i>                                   | 50  | 5.0  | 2.0  | 8.0  |
|  | HEAR5  | <i>Heteromeles arbutifolia</i>                          | 50  | 4.5  | 4.0  | 5.0  |
|  | LOHI2  | <i>Lonicera hispidula</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|  | ARMA   | <i>Arctostaphylos manzanita</i>                         | 25  | 30.0 | 30.0 | 30.0 |
|  | CECU   | <i>Ceanothus cuneatus</i>                               | 25  | 4.0  | 4.0  | 4.0  |
|  | GAFR   | <i>Garrya fremontii</i>                                 | 25  | 4.0  | 4.0  | 4.0  |
|  | ARGLG3 | <i>Arctostaphylos glandulosa</i> ssp. <i>glandulosa</i> | 25  | 3.0  | 3.0  | 3.0  |
|  | CEFOF3 | <i>Ceanothus foliosus</i> var. <i>foliosus</i>          | 25  | 3.0  | 3.0  | 3.0  |
|  | BAPI   | <i>Baccharis pilularis</i>                              | 25  | 1.0  | 1.0  | 1.0  |
|  | KELE   | <i>Keckiella lemmonii</i>                               | 25  | 1.0  | 1.0  | 1.0  |
|  | CLLA3  | <i>Clematis lasiantha</i>                               | 25  | 0.2  | 0.2  | 0.2  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | VUMY   | <i>Vulpia myuros</i>                                    | 25  | 1.0  | 1.0  | 1.0  |
|  | MAEL   | <i>Madia elegans</i>                                    | 25  | 0.2  | 0.2  | 0.2  |
|  | FESTU  | <i>Festuca</i>  | 25  | 0.2  | 0.2  | 0.2  |
|  | ERIOG  | <i>Eriogonum</i>  | 25  | 0.2  | 0.2  | 0.2  |
|  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>        | 25  | 0.2  | 0.2  | 0.2  |
|  | GAPH2  | <i>Gastroidium phleoides</i>                            | 25  | 0.2  | 0.2  | 0.2  |
|  | GNAPH  | <i>Gnaphalium</i>                                       | 25  | 0.2  | 0.2  | 0.2  |
|  | TRHI4  | <i>Trifolium hirtum</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | CESO3  | <i>Centaurea solstitialis</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|  | BRDI3  | <i>Bromus diandrus</i>                                  | 25  | 0.2  | 0.2  | 0.2  |
|  | PTDR   | <i>Pterostegia drymarioides</i>                         | 25  | 0.2  | 0.2  | 0.2  |
|  | BRMI2  | <i>Briza minor</i>                                      | 25  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 25  | 0.2  | 0.2  | 0.2  |
|  | 2LICHN | Lichen  | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.



***Rubus armeniacus* Semi-Natural Alliance**  
**Himalayan blackberry brambles**

Statewide (Sawyer et al. 2009)

*Rubus armeniacus* is dominant or co-dominant in the shrub canopy. Emergent trees may be present at low cover, including *Populus fremontii*, *Quercus agrifolia*, *Quercus lobata*, or *Salix* spp.

*Rubus armeniacus* grows in riparian habitats, mesic clearings, disturbed areas, and stock ponds throughout cismontane California. The native *Rubus ursinus* and non-native *R. armeniacus* have similar ecologies, and these species sometimes intermix. On the north California coast, *Rubus ursinus* forms extensive stands lacking *R. armeniacus*, but they remain unsampled. Stands dominated by the aggressive *Rubus armeniacus* are extensive in many areas in northern California, but they remain of little interest to land managers.

The native blackberry (*Rubus ursinus*) and rose brambles (*Rosa californica*, *R. nutkana*, and *R. woodsii*) are classified as separate alliances from the *Rubus armeniacus* type because of their differences in nativity and regional distributions.

Sonoma County

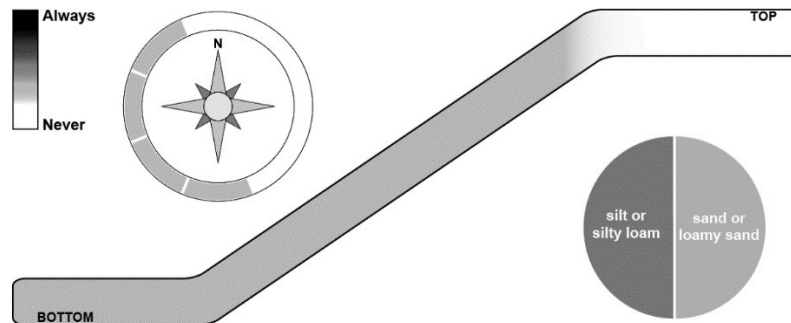
*Rubus armeniacus* stands tend to be associated with riparian areas and moist pastures with recently reduced grazing pressure. Although most *Rubus armeniacus* stands in the state are considered riparian, Sonoma County's cooler coastal stands may be located in upland mesic settings.

**Local Alliance Summary (n = 4)**

**Elevation:** 309–1413 ft, mean 777 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 68.5         | 54–88         | –          |
| <b>Herb</b>                          | 1.3          | 0–4           | <0.5–1     |
| <b>Shrub</b>                         | 66.0         | 45–88         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.5          | 0–1           | 1–5        |
| <b>Hardwood</b>                      | 3.3          | 0–12          | 2–15       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 4.8°  | 1–11°  |
| Large rock cover  | 4.1%  | 0–16%  |
| Small rock cover  | 17.5% | 0–45%  |
| Bare ground cover | 33.0% | 10–58% |
| Litter cover      | 42.8% | 27–72% |

**Associations within this Alliance:**

*Rubus armeniacus* Semi-Natural Association

**STAND TABLE**

***Rubus armeniacus* Semi-Natural Alliance**

n = 4

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | UMCA  | <i>Umbellularia californica</i>   | 50  | 2.5  | 1.0  | 4.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 25  | 4.0  | 4.0  | 4.0  |
|  | AECA  | <i>Aesculus californica</i>       | 25  | 3.0  | 3.0  | 3.0  |
|  | JUHI  | <i>Juglans hindsii</i>            | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 50  | 0.2  | 0.2  | 0.2  |
|  | SALA3 | <i>Salix laevigata</i>            | 25  | 4.0  | 4.0  | 4.0  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 100 | 65.5 | 43.0 | 88.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 50  | 0.6  | 0.2  | 1.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 50  | 0.2  | 0.2  | 0.2  |
|  | SALA6 | <i>Salix lasiolepis</i>           | 25  | 1.2  | 1.2  | 1.2  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | PHAQ  | <i>Phalaris aquatica</i>          | 25  | 3.0  | 3.0  | 3.0  |
|  | ARDO3 | <i>Artemisia douglasiana</i>      | 25  | 1.0  | 1.0  | 1.0  |
|  | CIVU  | <i>Cirsium vulgare</i>            | 25  | 0.2  | 0.2  | 0.2  |
|  | CYER  | <i>Cyperus eragrostis</i>         | 25  | 0.2  | 0.2  | 0.2  |
|  | EQUIS | <i>Equisetum</i>                  | 25  | 0.2  | 0.2  | 0.2  |
|  | HOMU  | <i>Hordeum murinum</i>            | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Rubus armeniacus* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 68.5         | 54–88         | –          |
| Herb             | 1.3          | 0–4           | <0.5–1     |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Shrub</b>                         | 66.0         | 45–88         | 1–5        |
| <b>Regenerating/understory tree*</b> | 0.5          | 0–1           | 1–5        |
| <b>Hardwood</b>                      | 3.3          | 0–12          | 2–15       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2), SW (2)

**Macrotopography:** bottom (1), lower 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (2), convex (1), flat (1)

**Parent material:** mixed alluvium (1), sandstone (1), volcanic (2)

**Soil texture:** sand (1), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 777 ft. | 309–1413 ft. |
| <b>Slope</b>             | 4.8°    | 1–11°        |
| <b>Large rock cover</b>  | 4.1%    | 0–16%        |
| <b>Small rock cover</b>  | 17.5%   | 0–45%        |
| <b>Bare ground cover</b> | 33.0%   | 10–58%       |
| <b>Litter cover</b>      | 42.8%   | 27–72%       |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0020, SONO0112, SONO0674, SONO0703

**Relevés:** none

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Rubus armeniacus* Semi-Natural Association**

n = 4

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | UMCA  | <i>Umbellularia californica</i>   | 50  | 2.5  | 1.0  | 4.0  |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 25  | 4.0  | 4.0  | 4.0  |
|  | AECA  | <i>Aesculus californica</i>       | 25  | 3.0  | 3.0  | 3.0  |
|  | JUHI  | <i>Juglans hindsii</i>            | 25  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QUAG  | * <i>Quercus agrifolia</i>        | 50  | 0.2  | 0.2  | 0.2  |
|  | SALA3 | <i>Salix laevigata</i>            | 25  | 4.0  | 4.0  | 4.0  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 100 | 65.5 | 43.0 | 88.0 |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 50  | 0.6  | 0.2  | 1.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 50  | 0.2  | 0.2  | 0.2  |
|  | SALA6 | <i>Salix lasiolepis</i>           | 25  | 1.2  | 1.2  | 1.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Rubus armeniacus* Semi-Natural Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                              |            |            |            |            |
|                 | PHAQ        | <i>Phalaris aquatica</i>     | 25         | 3.0        | 3.0        | 3.0        |
|                 | ARDO3       | <i>Artemisia douglasiana</i> | 25         | 1.0        | 1.0        | 1.0        |
|                 | EQUIS       | <i>Equisetum</i>             | 25         | 0.2        | 0.2        | 0.2        |
|                 | HOMU        | <i>Hordeum murinum</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                 | CYER        | <i>Cyperus eragrostis</i>    | 25         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>       | 25         | 0.2        | 0.2        | 0.2        |

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## ***Salix breweri* Alliance**

### **Brewer willow thickets**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Salix breweri* is dominant in the shrub canopy with *Arctostaphylos glauca*, *Calycanthus occidentalis*, *Frangula californica* ssp. *crassifolia*, *Frangula californica* ssp. *tomentella*, and *Rhododendron occidentale*. Emergent trees may be present at low cover, including *Calocedrus decurrens*, *Pinus coulteri*, *Pinus sabiniana*, or *Umbellularia californica*.

*Salix breweri* stands are characteristically located on serpentine in the Coast Ranges, along streams that have high and variable seasonal flow. Various wetland herbs occur in the stands with *S. breweri*, including *Aquilegia eximia*, *Solidago guiradonis* (CA rare plant rank 4.2) and *Trichostema rubisepalum* (CA rare plant rank 4.3; Evens et al. 2006).

#### Sonoma County

Although *Salix breweri* is the diagnostic species of a distinctive serpentine riparian alliance in the inner Coast Ranges north and south of the Bay Area, stands in Sonoma County are only known from The Cedars. These stands are small and narrow, and they overlap ecologically with *Frangula californica* – *Rhododendron occidentale* and *Hesperocyparis sargentii* Alliance stands, making them difficult to identify on imagery. The single stand included in this classification was sampled in gravelly alluvium along upper Austin Creek within the core of The Cedars serpentine area.

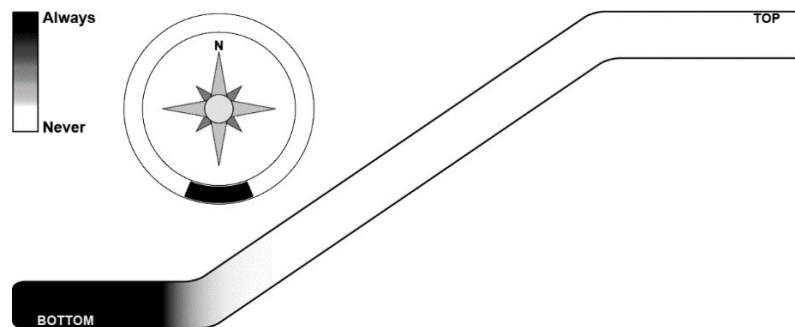
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#### **Local Alliance Summary (n = 1)**

**Elevation:** 825 ft

**SCV Global/State Rank:** G2/S2<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 15.0         | 15            | –          |
| <b>Herb</b>                          | 1.0          | 1             | <0.5–0.5   |
| <b>Shrub</b>                         | 13.0         | 13            | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.2          | 0.2           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 3.0°  | 3°    |
| <b>Large rock cover</b>  | 45.0% | 45%   |
| <b>Small rock cover</b>  | 40.0% | 40%   |
| <b>Bare ground cover</b> | 2.0%  | 2%    |
| <b>Litter cover</b>      | 4.0%  | 4%    |

**Associations within this Alliance:**

*Salix breweri* Provisional Association

**STAND TABLE**

***Salix breweri* Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name                                     | Con | Avg | Min | Max |
|--|--------|--|-----|-----|-----|-----|
| <b>Tree</b>                            |        |  |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                  | 100 | 0.2 | 0.2 | 0.2 |
| <b>Regenerating or Understory Tree</b> |        |  |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                  | 100 | 0.2 | 0.2 | 0.2 |
| <b>Shrub</b>                           |        |  |     |     |     |     |
|  | SABR2  | <i>Salix breweri</i>                               | 100 | 9.0 | 9.0 | 9.0 |
|  | FRCAT2 | <i>Frangula californica</i> ssp. <i>tomentella</i> | 100 | 3.0 | 3.0 | 3.0 |
|  | RHOC   | <i>Rhododendron occidentale</i>                    | 100 | 1.0 | 1.0 | 1.0 |
| <b>Herb</b>                            |        |  |     |     |     |     |
|  | AQEX   | <i>Aquilegia eximia</i>                            | 100 | 0.2 | 0.2 | 0.2 |
|  | CAME5  | <i>Carex mendocinensis</i>                         | 100 | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Salix breweri* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 15.0         | 15            | –          |
| <b>Herb</b>             | 1.0          | 1             | <0.5–0.5   |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Shrub</b>                         | 13.0         | 13            | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.2          | 0.2           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1)

**Macrotopography:** Bottom (1)

**Microtopography:** flat (1)

**Parent material:** Ultramafic (1)

**Soil texture:** No data

**Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 825 ft. | 825 ft. |
| <b>Slope</b>             | 3.0°    | 3°      |
| <b>Large rock cover</b>  | 45.0%   | 45%     |
| <b>Small rock cover</b>  | 40.0%   | 40%     |
| <b>Bare ground cover</b> | 2.0%    | 2%      |
| <b>Litter cover</b>      | 4.0%    | 4%      |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0310

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Salix breweri* Provisional Association**

n = 1

| Lifeform                               | Code   | Botanical Name                                     | Con | Avg | Min | Max |
|--|--------|--|-----|-----|-----|-----|
| <b>Tree</b>                            |        |  |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                  | 100 | 0.2 | 0.2 | 0.2 |
| <b>Regenerating or Understory Tree</b> |        |  |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i>                  | 100 | 0.2 | 0.2 | 0.2 |
| <b>Shrub</b>                           |        |  |     |     |     |     |
|  | SABR2  | <i>Salix breweri</i>                               | 100 | 9.0 | 9.0 | 9.0 |
|  | FRCAT2 | <i>Frangula californica</i> ssp. <i>tomentella</i> | 100 | 3.0 | 3.0 | 3.0 |
|  | RHOC   | <i>Rhododendron occidentale</i>                    | 100 | 1.0 | 1.0 | 1.0 |
| <b>Herb</b>                            |        |  |     |     |     |     |
|  | AQEX   | <i>Aquilegia eximia</i>                            | 100 | 0.2 | 0.2 | 0.2 |
|  | CAME5  | <i>Carex mendocinensis</i>                         | 100 | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Salix exigua* Alliance**

### **Sandbar willow thickets**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Salix exigua* is dominant or co-dominant in the shrub canopy with *Baccharis* spp., *Brickellia californica*, *Rosa californica*, *Rubus armeniacus*, *Rubus ursinus*, *Salix lasiolepis*, and *Salix melanopsis*. Emergent trees of many different species may be present at low cover.

The *Salix exigua* Alliance is widespread and common throughout California, especially along seasonally or temporarily flowing streams and at seeps. It often forms dense, clonal stands. Great regional variation exists in shrub and understory composition, ranging from Sierran mountain meadow species to those found in Colorado Desert oases. Along the Sacramento River and elsewhere in the Central Valley, *Salix exigua* are the first shrubs to colonize point bars and cut banks, followed in time by *Populus fremontii* and other tall, longer-lived species (Sands 1980). Rivers with flood-control dams in place may have reduced acreage of *Salix exigua* stands and increases in stands of longer-lived tree willows such as *S. gooddingii*, *S. laevigata*, and *S. lucida*.

#### Sonoma County

*Salix exigua* stands are found along gravel bars and at the edges of active channels of larger creeks and rivers in Sonoma County, away from the immediate coast. They are spatially related to other active fluvial, process-driven vegetation, but tend to occur closer to active channels than larger stands of *Populus fremontii* and *Fraxinus latifolia* Alliances. *Salix exigua* stands are easily distinguished on imagery from other interior riparian shrublands by their distinctive gray-green clonal signature.

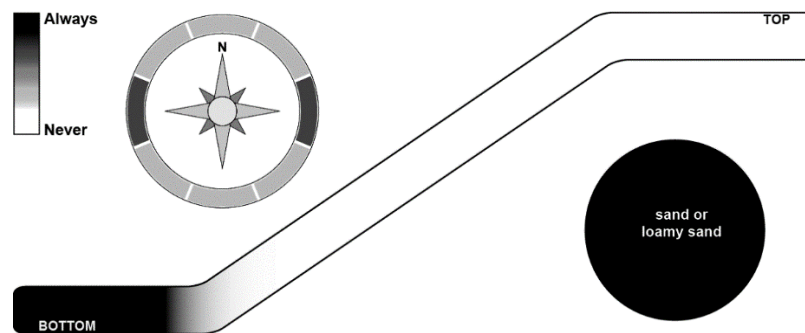
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#### **Local Alliance Summary (n = 4)**

**Elevation:** 40–446 ft, mean 206 ft

**SCV Global/State Rank:** G5/S4<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.3         | 40–90         | –          |
| <b>Herb</b>                          | 7.8          | 0–21          | <0.5–1     |
| <b>Shrub</b>                         | 44.3         | 30–72         | 2–5        |
| <b>Regenerating/understory tree*</b> | 6.3          | 2–13          | 0.5–10     |
| <b>Hardwood</b>                      | 4.0          | 0–9           | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 0.8°  | 0–1°   |
| <b>Large rock cover</b>  | 2.5%  | 0–5%   |
| <b>Small rock cover</b>  | 43.6% | 20–70% |
| <b>Bare ground cover</b> | 24.0% | 12–39% |
| <b>Litter cover</b>      | 27.8% | 6–60%  |

**Associations within this Alliance:**

*Salix exigua* – *Salix melanopsis* Association  
*Salix exigua* Association

**STAND TABLE**

***Salix exigua* Alliance**

n = 4

| Lifeform                               | Code   | Botanical Name                               | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | SALA3  | * <i>Salix laevigata</i>                     | 50  | 8.0  | 7.0  | 9.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | SALA3  | * <i>Salix laevigata</i>                     | 100 | 4.3  | 1.0  | 9.0  |
|  | POFR2  | <i>Populus fremontii</i>                     | 50  | 2.5  | 1.0  | 4.0  |
|  | FRLA   | <i>Fraxinus latifolia</i>                    | 25  | 2.0  | 2.0  | 2.0  |
|  | SALIX  | <i>Salix</i>                                 | 25  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | SAEX   | <i>Salix exigua</i>                          | 100 | 23.8 | 0.2  | 43.0 |
|  | SAME2  | <i>Salix melanopsis</i>                      | 25  | 68.0 | 68.0 | 68.0 |
|  | RUAR9  | <i>Rubus armeniacus</i>                      | 25  | 7.0  | 7.0  | 7.0  |
|  | VIAMA3 | <i>Vicia americana</i> ssp. <i>americana</i> | 25  | 6.0  | 6.0  | 6.0  |
|  | VICA5  | <i>Vitis californica</i>                     | 25  | 2.0  | 2.0  | 2.0  |
|  | GEMO2  | <i>Genista monspessulana</i>                 | 25  | 1.0  | 1.0  | 1.0  |
| <b>Herb</b>                            |        |  |     |      |      |      |
|  | CYDA   | <i>Cynodon dactylon</i>                      | 50  | 3.6  | 0.2  | 7.0  |
|  | ARDO3  | <i>Artemisia douglasiana</i>                 | 50  | 2.6  | 0.2  | 5.0  |
|  | HIIN3  | <i>Hirschfeldia incana</i>                   | 50  | 1.6  | 0.2  | 3.0  |
|  | BRNI   | <i>Brassica nigra</i>                        | 50  | 1.0  | 1.0  | 1.0  |
|  | MEOF   | <i>Melilotus officinalis</i>                 | 50  | 0.2  | 0.2  | 0.2  |
|  | XAST   | <i>Xanthium strumarium</i>                   | 50  | 0.2  | 0.2  | 0.2  |
|  | BASA4  | <i>Baccharis salicifolia</i>                 | 25  | 5.0  | 5.0  | 5.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

**Salix exigua Alliance**

n = 4

| Lifeform     | Code   | Botanical Name              | Con | Avg | Min | Max |
|--------------|--------|-----------------------------|-----|-----|-----|-----|
| Herb         | AGST2  | <i>Agrostis stolonifera</i> | 25  | 2.0 | 2.0 | 2.0 |
|              | BRDI3  | <i>Bromus diandrus</i>      | 25  | 2.0 | 2.0 | 2.0 |
|              | CRSE11 | <i>Croton setigerus</i>     | 25  | 2.0 | 2.0 | 2.0 |
|              | CYER   | <i>Cyperus eragrostis</i>   | 25  | 2.0 | 2.0 | 2.0 |
|              | FOVU   | <i>Foeniculum vulgare</i>   | 25  | 2.0 | 2.0 | 2.0 |
|              | VUMY   | <i>Vulpia myuros</i>        | 25  | 2.0 | 2.0 | 2.0 |
|              | AVBA   | <i>Avena barbata</i>        | 25  | 1.0 | 1.0 | 1.0 |
|              | PHAQ   | <i>Phalaris aquatica</i>    | 25  | 1.0 | 1.0 | 1.0 |
|              | CAREX  | <i>Carex</i>                | 25  | 0.2 | 0.2 | 0.2 |
|              | COAR4  | <i>Convolvulus arvensis</i> | 25  | 0.2 | 0.2 | 0.2 |
|              | ELGL   | <i>Elymus glaucus</i>       | 25  | 0.2 | 0.2 | 0.2 |
|              | EPCI   | <i>Epilobium ciliatum</i>   | 25  | 0.2 | 0.2 | 0.2 |
|              | HYPE   | <i>Hypericum perforatum</i> | 25  | 0.2 | 0.2 | 0.2 |
|              | LOPE   | <i>Lolium perenne</i>       | 25  | 0.2 | 0.2 | 0.2 |
|              | MEPU   | <i>Mentha pulegium</i>      | 25  | 0.2 | 0.2 | 0.2 |
|              | POLYP2 | <i>Polypogon</i>            | 25  | 0.2 | 0.2 | 0.2 |
|              | TONO   | <i>Torilis nodosa</i>       | 25  | 0.2 | 0.2 | 0.2 |
|              | VEBL   | <i>Verbascum blattaria</i>  | 25  | 0.2 | 0.2 | 0.2 |
|              | VETH   | <i>Verbascum thapsus</i>    | 25  | 0.2 | 0.2 | 0.2 |
|              | VERON  | <i>Veronica</i>             | 25  | 0.2 | 0.2 | 0.2 |
|              | LIDI2  | <i>Linanthus dichotomus</i> | 25  | 0.1 | 0.1 | 0.1 |
| Non-vascular | 2MOSS  | Moss                        | 25  | 0.2 | 0.2 | 0.2 |

**Salix exigua – Salix melanopsis Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 90.0         | 90            | –          |
| Herb                          | 0.2          | 0.2           | <0.5–0.5   |
| Shrub                         | 72.0         | 72            | 2–5        |
| Regenerating/understory tree* | 13.0         | 13            | 5–10       |
| Hardwood                      | 9.0          | 9             | 5–10       |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)

**Macrotopography:** bottom (1)

**Microtopography:** concave (1)

**Parent material:** Franciscan melange (1)

**Soil texture:** no data

**Slope steepness:** gentle/1-5° (1)

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|                   | Mean    | Range   |
|-------------------|---------|---------|
| Elevation         | 298 ft. | 298 ft. |
| Slope             | 1.0°    | 1°      |
| Large rock cover  | 5.0%    | 5%      |
| Small rock cover  | 20.0%   | 20%     |
| Bare ground cover | 12.0%   | 12%     |
| Litter cover      | 60.0%   | 60%     |

**Samples Used to Describe Association (n=1)**

Rapid Assessments: SONO0598

Relevés: none

SCV Global/State Rank: G3?/S3?<sup>1</sup>

**STAND TABLE**

***Salix exigua* – *Salix melanopsis* Association**

n = 1

| Lifeform                               | Code  | Botanical Name               | Con | Avg  | Min  | Max  |
|--|-------|------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                              |     |      |      |      |
|  | SALA3 | * <i>Salix laevigata</i>     | 100 | 9.0  | 9.0  | 9.0  |
| <b>Regenerating or Understory Tree</b> |       |                              |     |      |      |      |
|  | SALA3 | * <i>Salix laevigata</i>     | 100 | 9.0  | 9.0  | 9.0  |
|  | POFR2 | <i>Populus fremontii</i>     | 100 | 4.0  | 4.0  | 4.0  |
| <b>Shrub</b>                           |       |                              |     |      |      |      |
|  | SAME2 | <i>Salix melanopsis</i>      | 100 | 68.0 | 68.0 | 68.0 |
|  | SAEX  | <i>Salix exigua</i>          | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                              |     |      |      |      |
|  | BASA4 | <i>Baccharis salicifolia</i> | 100 | 5.0  | 5.0  | 5.0  |
|  | HIIN3 | <i>Hirschfeldia incana</i>   | 100 | 0.2  | 0.2  | 0.2  |
|  | VEBL  | <i>Verbascum blattaria</i>   | 100 | 0.2  | 0.2  | 0.2  |
|  | VETH  | <i>Verbascum thapsus</i>     | 100 | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Salix exigua* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 43.7         | 40–48         | –          |
| <b>Herb</b>             | 10.3         | 3–21          | <0.5–1     |
| <b>Shrub</b>            | 35.0         | 30–43         | 2–5        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 4.0          | 2–8           | 0.5–5      |
| <b>Hardwood</b>                      | 2.3          | 0–7           | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), NE (1)  
**Macrotopography:** bottom (3)  
**Microtopography:** concave (1), flat (1), undulating (1)  
**Parent material:** sandstone (2), volcanic (1)  
**Soil texture:** sand (2)  
**Slope steepness:** flat/0° (1), gentle/1-5° (2)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 176 ft. | 40–446 ft. |
| <b>Slope</b>             | 0.7°    | 0–1°       |
| <b>Large rock cover</b>  | 1.7%    | 0–5%       |
| <b>Small rock cover</b>  | 51.4%   | 40–70%     |
| <b>Bare ground cover</b> | 28.0%   | 15–39%     |
| <b>Litter cover</b>      | 17.0%   | 6–25%      |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0168, SONO0204, SONO0997  
**Relevés:** none

**SCV Global/State Rank:** G4/S4?<sup>1</sup>

**STAND TABLE**

***Salix exigua* Association**

n = 3

| Lifeform                               | Code   | Botanical Name                               | Con | Avg  | Min  | Max  |
|--|--------|--|-----|------|------|------|
| <b>Tree</b>                            |        |  |     |      |      |      |
|  | SALA3  | * <i>Salix laevigata</i>                     | 33  | 7.0  | 7.0  | 7.0  |
| <b>Regenerating or Understory Tree</b> |        |  |     |      |      |      |
|  | SALA3  | * <i>Salix laevigata</i>                     | 100 | 2.7  | 1.0  | 6.0  |
|  | FRLA   | <i>Fraxinus latifolia</i>                    | 33  | 2.0  | 2.0  | 2.0  |
|  | POFR2  | <i>Populus fremontii</i>                     | 33  | 1.0  | 1.0  | 1.0  |
|  | SALIX  | <i>Salix</i>                                 | 33  | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |        |  |     |      |      |      |
|  | SAEX   | <i>Salix exigua</i>                          | 100 | 31.7 | 20.0 | 43.0 |
|  | RUAR9  | <i>Rubus armeniacus</i>                      | 33  | 7.0  | 7.0  | 7.0  |
|  | VIAMA3 | <i>Vicia americana</i> ssp. <i>americana</i> | 33  | 6.0  | 6.0  | 6.0  |
|  | VICA5  | <i>Vitis californica</i>                     | 33  | 2.0  | 2.0  | 2.0  |
|  | GEMO2  | <i>Genista monspessulana</i>                 | 33  | 1.0  | 1.0  | 1.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

**Salix exigua Association**

n = 3

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                              |            |            |            |            |
|                     | CYDA        | <i>Cynodon dactylon</i>      | 67         | 3.6        | 0.2        | 7.0        |
|                     | ARDO3       | <i>Artemisia douglasiana</i> | 67         | 2.6        | 0.2        | 5.0        |
|                     | BRNI        | <i>Brassica nigra</i>        | 67         | 1.0        | 1.0        | 1.0        |
|                     | MEOF        | <i>Melilotus officinalis</i> | 67         | 0.2        | 0.2        | 0.2        |
|                     | XAST        | <i>Xanthium strumarium</i>   | 67         | 0.2        | 0.2        | 0.2        |
|                     | HIIN3       | <i>Hirschfeldia incana</i>   | 33         | 3.0        | 3.0        | 3.0        |
|                     | AGST2       | <i>Agrostis stolonifera</i>  | 33         | 2.0        | 2.0        | 2.0        |
|                     | BRDI3       | <i>Bromus diandrus</i>       | 33         | 2.0        | 2.0        | 2.0        |
|                     | CRSE11      | <i>Croton setigerus</i>      | 33         | 2.0        | 2.0        | 2.0        |
|                     | CYER        | <i>Cyperus eragrostis</i>    | 33         | 2.0        | 2.0        | 2.0        |
|                     | FOVU        | <i>Foeniculum vulgare</i>    | 33         | 2.0        | 2.0        | 2.0        |
|                     | VUMY        | <i>Vulpia myuros</i>         | 33         | 2.0        | 2.0        | 2.0        |
|                     | PHAQ        | <i>Phalaris aquatica</i>     | 33         | 1.0        | 1.0        | 1.0        |
|                     | AVBA        | <i>Avena barbata</i>         | 33         | 1.0        | 1.0        | 1.0        |
|                     | VERON       | <i>Veronica</i>              | 33         | 0.2        | 0.2        | 0.2        |
|                     | TONO        | <i>Torilis nodosa</i>        | 33         | 0.2        | 0.2        | 0.2        |
|                     | POLYP2      | <i>Polypogon</i>             | 33         | 0.2        | 0.2        | 0.2        |
|                     | MEPU        | <i>Mentha pulegium</i>       | 33         | 0.2        | 0.2        | 0.2        |
|                     | LOPE        | <i>Lolium perenne</i>        | 33         | 0.2        | 0.2        | 0.2        |
|                     | HYPE        | <i>Hypericum perforatum</i>  | 33         | 0.2        | 0.2        | 0.2        |
|                     | EPCI        | <i>Epilobium ciliatum</i>    | 33         | 0.2        | 0.2        | 0.2        |
|                     | ELGL        | <i>Elymus glaucus</i>        | 33         | 0.2        | 0.2        | 0.2        |
|                     | CAREX       | <i>Carex</i>                 | 33         | 0.2        | 0.2        | 0.2        |
|                     | COAR4       | <i>Convolvulus arvensis</i>  | 33         | 0.2        | 0.2        | 0.2        |
|                     | LIDI2       | <i>Linanthus dichotomus</i>  | 33         | 0.1        | 0.1        | 0.1        |
| <b>Non-vascular</b> |             |                              |            |            |            |            |
|                     | 2MOSS       | Moss                         | 33         | 0.2        | 0.2        | 0.2        |

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## ***Salix lasiolepis* Alliance**

### **Arroyo willow thickets**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Salix lasiolepis* is dominant or co-dominant in the tall shrub or low tree canopy with *Acer macrophyllum*, *Baccharis pilularis*, *Baccharis salicifolia*, *Cephalanthus occidentalis*, *Cornus sericea*, *Morella californica*, *Platanus racemosa*, *Populus fremontii*, *Populus trichocarpa*, *Salix* spp., and *Sambucus nigra*. Emergent trees may be present at low cover.

*Salix lasiolepis* grows on seasonally or intermittently flooded sites. Some *S. lasiolepis* plants in California stands are sufficiently tall to be considered trees. Plants are typically shrubby and multi-branched along coastal creeks, at lower and middle elevations, and in parts of the Sacramento–San Joaquin River delta. Both forms are included in this alliance: *Salix lasiolepis* var. *bigelovii* is a coastal plant, and *S. lasiolepis* var. *lasiolepis* grows throughout the state (Argus 1997). Disturbances during winter floods modify stands; timing of seed dispersal and spring flood patterns determine seedling success.

#### Sonoma County

*Salix lasiolepis* Alliance stands are widespread throughout the county, ranging from the immediate coast to inland sites. The variable size of *Salix lasiolepis* individuals, from small shrubs to almost tree-size, sometimes makes them difficult to distinguish from tree willow stands (*S. laevigata*, *S. lucida* ssp. *lasiandra*), and their variable coloration, bright green to somewhat dull grayish green, makes them difficult to differentiate from the coastal shrub willows (*Salix hookeriana* and *S. sitchensis*). There is also some evidence that coastal stands of *Salix lasiolepis* may hybridize with *S. sitchensis*.

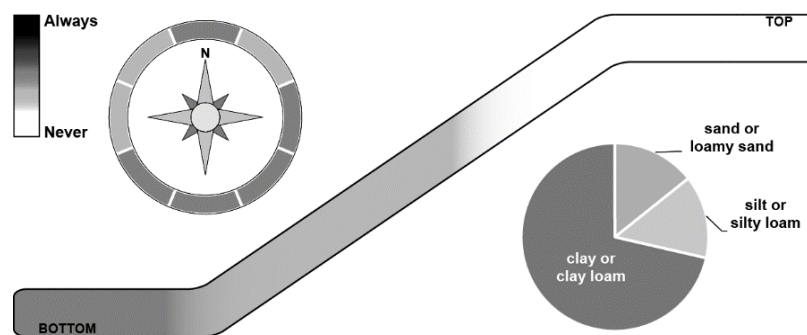
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#### **Local Alliance Summary (n = 15)**

**Elevation:** 11–1111 ft, mean 260 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 74.2         | 27–100        | –          |
| <b>Herb</b>                          | 13.9         | 0–70          | <0.5–2     |
| <b>Shrub</b>                         | 59.1         | 0.2–95        | <0.5–10    |
| <b>Regenerating/understory tree*</b> | 3.7          | 0–30          | 2–10       |
| <b>Hardwood</b>                      | 9.3          | 0–50          | 2–15       |
| <b>Conifer</b>                       | 0.2          | 0–1           | 2–20       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 1.7°  | 0–5°   |
| <b>Large rock cover</b>  | 0.8%  | 0–10%  |
| <b>Small rock cover</b>  | 5.6%  | 0–40%  |
| <b>Bare ground cover</b> | 14.0% | 0–49%  |
| <b>Litter cover</b>      | 71.7% | 10–95% |

**Associations within this Alliance:**

*Salix lasiolepis* – *Rubus* spp. Association

**STAND TABLE**

***Salix lasiolepis* Alliance**

n = 15

| Lifeform                               | Code  | Botanical Name                            | Con | Avg  | Min | Max  |
|--|-------|---|-----|------|-----|------|
| <b>Tree</b>                            |       |   |     |      |     |      |
|  | SALA3 | <i>Salix laevigata</i>                    | 40  | 2.3  | 1.0 | 5.0  |
|  | FRLA  | * <i>Fraxinus latifolia</i>               | 20  | 3.0  | 1.0 | 4.0  |
|  | SALUL | <i>Salix lucida</i> ssp. <i>lasiandra</i> | 20  | 3.0  | 1.0 | 6.0  |
| <b>Regenerating or Understory Tree</b> |       |   |     |      |     |      |
|  | FRLA  | * <i>Fraxinus latifolia</i>               | 20  | 1.4  | 1.0 | 2.0  |
|  | PSME  | <i>Pseudotsuga menziesii</i>              | 20  | 0.5  | 0.2 | 1.0  |
| <b>Shrub</b>                           |       |   |     |      |     |      |
|  | SALA6 | <i>Salix lasiolepis</i>                   | 100 | 46.9 | 9.0 | 80.0 |
|  | RUUR  | <i>Rubus ursinus</i>                      | 60  | 6.9  | 0.2 | 20.0 |
|  | RUAR9 | <i>Rubus armeniacus</i>                   | 53  | 33.4 | 3.0 | 70.0 |
|  | BAPI  | <i>Baccharis pilularis</i>                | 40  | 1.4  | 0.2 | 3.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>         | 33  | 1.2  | 0.2 | 5.0  |
| <b>Herb</b>                            |       |   |     |      |     |      |
|  | HOLA  | <i>Holcus lanatus</i>                     | 40  | 3.0  | 0.2 | 15.0 |
|  | CYER  | <i>Cyperus eragrostis</i>                 | 33  | 0.9  | 0.2 | 3.0  |
|  | JUPA2 | <i>Juncus patens</i>                      | 27  | 0.9  | 0.2 | 2.0  |
|  | JUNCU | <i>Juncus</i>                             | 27  | 0.2  | 0.2 | 0.2  |
|  | MEPU  | <i>Mentha pulegium</i>                    | 20  | 1.8  | 0.2 | 5.0  |
|  | RUMEX | <i>Rumex</i>                              | 20  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b>                    |       |   |     |      |     |      |
|  | 2MOSS | Moss                                      | 27  | 2.9  | 0.2 | 10.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

## ***Salix lasiolepis* – *Rubus* spp. Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4), Coastal Hills-Santa Rosa Plain/263Aj (9), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 74.2                | 27–100               | –                 |
| <b>Herb</b>                          | 13.9                | 0–70                 | <0.5–2            |
| <b>Shrub</b>                         | 59.1                | 0.2–95               | <0.5–10           |
| <b>Regenerating/understory tree*</b> | 3.7                 | 0–30                 | 2–10              |
| <b>Hardwood</b>                      | 9.3                 | 0–50                 | 2–15              |
| <b>Conifer</b>                       | 0.2                 | 0–1                  | 2–20              |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (4), NE (1), SE (4), SW (5)

**Macrotopography:** bottom (9), lower 1/3 of slope (4), middle 1/3 of slope (2)

**Microtopography:** concave (8), flat (5), undulating (2)

**Parent material:** clayey alluvium (1), franciscan melange (2), metasedimentary (1),

mixed alluvium (3), sandstone (4), sandy alluvium (1), sedimentary (1), silty alluvium (1), volcanic (1)

**Soil texture:** clay or clay loam (5), sand (1), silt or silt loam (1)

**Slope steepness:** flat/0° (3), gentle/1-5° (10)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 260 ft.     | 11–1111 ft.  |
| <b>Slope</b>             | 1.7°        | 0–5°         |
| <b>Large rock cover</b>  | 0.8%        | 0–10%        |
| <b>Small rock cover</b>  | 5.6%        | 0–40%        |
| <b>Bare ground cover</b> | 14.0%       | 0–49%        |
| <b>Litter cover</b>      | 71.7%       | 10–95%       |

### **Samples Used to Describe Association (n=15)**

**Rapid Assessments:** MILOB107, SONO0199, SONO0206, SONO0411, SONO0426, SONO0530, SONO0650, SONO0661, SONO0670, SONO0702, SONO0736, SONO0881, SONO0910, SONO2207

**Relevés:** SONO0164

**SCV Global/State Rank:** G4/S4<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**STAND TABLE**

***Salix lasiolepis* – *Rubus* spp. Association**

n = 15

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>                            |             |   |            |            |            |            |
|  | SALA3       | <i>Salix laevigata</i>                    | 40         | 2.3        | 1.0        | 5.0        |
|  | FRLA        | * <i>Fraxinus latifolia</i>               | 20         | 3.0        | 1.0        | 4.0        |
|  | SALUL       | <i>Salix lucida</i> ssp. <i>lasiandra</i> | 20         | 3.0        | 1.0        | 6.0        |
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | FRLA        | * <i>Fraxinus latifolia</i>               | 20         | 1.4        | 1.0        | 2.0        |
|  | PSME        | <i>Pseudotsuga menziesii</i>              | 20         | 0.5        | 0.2        | 1.0        |
| <b>Shrub</b>                           |             |   |            |            |            |            |
|  | SALA6       | <i>Salix lasiolepis</i>                   | 100        | 46.9       | 9.0        | 80.0       |
|  | RUUR        | <i>Rubus ursinus</i>                      | 60         | 6.9        | 0.2        | 20.0       |
|  | RUAR9       | <i>Rubus armeniacus</i>                   | 53         | 33.4       | 3.0        | 70.0       |
|  | BAPI        | <i>Baccharis pilularis</i>                | 40         | 1.4        | 0.2        | 3.0        |
|  | TODI        | <i>Toxicodendron diversilobum</i>         | 33         | 1.2        | 0.2        | 5.0        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | HOLA        | <i>Holcus lanatus</i>                     | 40         | 3.0        | 0.2        | 15.0       |
|  | CYER        | <i>Cyperus eragrostis</i>                 | 33         | 0.9        | 0.2        | 3.0        |
|  | JUPA2       | <i>Juncus patens</i>                      | 27         | 0.9        | 0.2        | 2.0        |
|  | JUNCU       | <i>Juncus</i>                             | 27         | 0.2        | 0.2        | 0.2        |
|  | MEPU        | <i>Mentha pulegium</i>                    | 20         | 1.8        | 0.2        | 5.0        |
|  | RUMEX       | <i>Rumex</i>                              | 20         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b>                    |             |   |            |            |            |            |
|  | 2MOSS       | Moss                                      | 27         | 2.9        | 0.2        | 10.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Salix sitchensis* Provisional Alliance**  
**Sitka willow thickets**

Statewide (Sawyer et al. 2009)

*Salix sitchensis* is dominant in the tall shrub or low tree canopy with *Acer macrophyllum*, *Alnus rubra*, *Cornus sericea*, *Populus trichocarpa*, *Rubus* spp., *Salix* spp., and *Sambucus nigra*. Emergent trees may be present at low cover.

*Salix sitchensis* ranges from Alaska to California. *Salix hookeriana* is ecologically and morphologically similar to *S. sitchensis*. They both grow along low-elevation streams and lagoons along the north coast of California. So far, most willow stands observed on the north coast, north of Sonoma County, are dominated by *S. hookeriana*.

Sonoma County

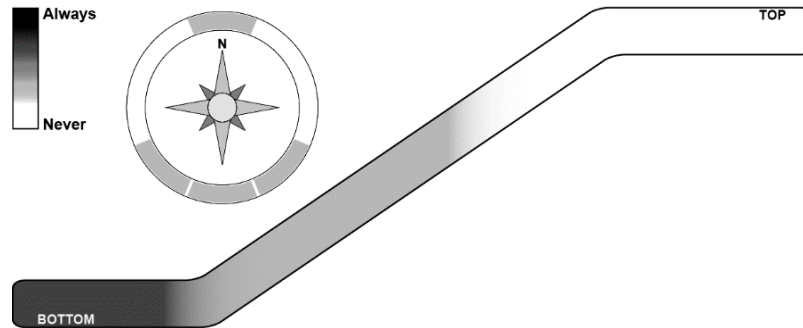
*Salix sitchensis* stands exist in small coastal creeks and ravines within a few kilometers of the immediate coast. In general, they can be identified by their grayish-green color, in contrast to the brighter yellowish-green of *Salix lasiolepis*, although some hybridization is known to occur.

**Local Alliance Summary (n = 8)**

**Elevation:** 30–347 ft, mean 141 ft

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 62.4         | 23–92         | –          |
| <b>Herb</b>                          | 16.9         | 1–72          | <0.5–2     |
| <b>Shrub</b>                         | 46.4         | 0.2–88        | 0.5–5      |
| <b>Regenerating/understory tree*</b> | 0.7          | 0–2           | 2–10       |
| <b>Hardwood</b>                      | 3.7          | 0–20          | 2–15       |
| <b>Conifer</b>                       | 1.1          | 0–4           | 5–15       |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 5.0°  | 1–15° |
| Large rock cover  | 3.9%  | 0–18% |
| Small rock cover  | 29.0% | 0–76% |
| Bare ground cover | 12.5% | 0–26% |
| Litter cover      | 47.3% | 2–97% |

**Associations within this Alliance:**

*Salix sitchensis* Provisional Association

**STAND TABLE**

***Salix sitchensis* Provisional Alliance**

n = 8

| Lifeform                               | Code  | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--|-------|--|-----|------|------|------|
| <b>Tree</b>                            |       |  |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                     | 38  | 2.7  | 2.0  | 4.0  |
|  | ALRU2 | * <i>Alnus rubra</i>                               | 38  | 1.8  | 0.2  | 5.0  |
| <b>Regenerating or Understory Tree</b> |       |  |     |      |      |      |
|  | PSME  | * <i>Pseudotsuga menziesii</i>                     | 38  | 1.1  | 0.2  | 2.2  |
|  | ALRU2 | * <i>Alnus rubra</i>                               | 25  | 0.8  | 0.4  | 1.2  |
| <b>Shrub</b>                           |       |  |     |      |      |      |
|  | SASI2 | <i>Salix sitchensis</i>                            | 100 | 40.7 | 17.0 | 65.0 |
|  | RUUR  | <i>Rubus ursinus</i>                               | 63  | 2.9  | 0.2  | 7.0  |
|  | TODI  | <i>Toxicodendron diversilobum</i>                  | 63  | 1.5  | 0.2  | 5.0  |
|  | RUPA  | <i>Rubus parviflorus</i>                           | 50  | 4.3  | 0.2  | 9.0  |
|  | BAPI  | <i>Baccharis pilularis</i>                         | 50  | 0.4  | 0.2  | 1.0  |
|  | MOCA6 | <i>Morella californica</i>                         | 38  | 2.1  | 0.2  | 5.0  |
|  | LOINL | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 25  | 9.5  | 2.0  | 17.0 |
|  | SALA6 | <i>Salix lasiolepis</i>                            | 25  | 4.1  | 0.2  | 8.0  |
|  | RISA  | <i>Ribes sanguineum</i>                            | 25  | 1.6  | 0.2  | 3.0  |
|  | HODI  | <i>Holodiscus discolor</i>                         | 25  | 1.1  | 0.2  | 2.0  |
| <b>Herb</b>                            |       |  |     |      |      |      |
|  | HOLA  | <i>Holcus lanatus</i>                              | 38  | 2.1  | 0.2  | 3.0  |
|  | EQUIS | <i>Equisetum</i>                                   | 38  | 1.1  | 0.2  | 3.0  |
|  | ATFI  | <i>Athyrium filix-femina</i>                       | 38  | 0.8  | 0.2  | 2.0  |
|  | MEPU  | <i>Mentha pulegium</i>                             | 38  | 0.2  | 0.2  | 0.2  |
|  | SCMI2 | <i>Scirpus microcarpus</i>                         | 25  | 26.0 | 15.0 | 37.0 |
|  | EQTEB | <i>Equisetum telmateia</i> var. <i>braunii</i>     | 25  | 21.5 | 1.0  | 42.0 |
|  | JUNCU | <i>Juncus</i>                                      | 25  | 5.1  | 0.2  | 10.0 |
|  | CANU5 | <i>Carex nudata</i>                                | 25  | 4.0  | 1.0  | 7.0  |
|  | SCCA2 | <i>Scrophularia californica</i>                    | 25  | 0.6  | 0.2  | 1.0  |
|  | WOFI  | <i>Woodwardia fimbriata</i>                        | 25  | 0.6  | 0.2  | 1.0  |
| <b>Non-vascular</b>                    |       |  |     |      |      |      |
|  | 2MOSS | Moss   | 38  | 8.5  | 0.2  | 25.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

## ***Salix sitchensis* Provisional Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 62.4                | 23–92                | –                 |
| <b>Herb</b>                          | 16.9                | 1–72                 | <0.5–2            |
| <b>Shrub</b>                         | 46.4                | 0.2–88               | 0.5–5             |
| <b>Regenerating/understory tree*</b> | 0.7                 | 0–2                  | 2–10              |
| <b>Hardwood</b>                      | 3.7                 | 0–20                 | 2–15              |
| <b>Conifer</b>                       | 1.1                 | 0–4                  | 5–15              |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** NW (1), SE (3), SW (3)

**Macrotopography:** bottom (5), bottom to lower 1/3 of slope (1), lower 1/3 of slope (1), middle 1/3 of slope (1)

**Microtopography:** concave (5), flat (2)

**Parent material:** clayey alluvium (1), franciscan melange (1), metasedimentary (1), mixed alluvium (1), sandstone (4)

**Soil texture:** no data

**Slope steepness:** gentle/1-5° (5), moderate/6-25° (2)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 141 ft.     | 30–347 ft.   |
| <b>Slope</b>             | 5.0°        | 1–15°        |
| <b>Large rock cover</b>  | 3.9%        | 0–18%        |
| <b>Small rock cover</b>  | 29.0%       | 0–76%        |
| <b>Bare ground cover</b> | 12.5%       | 0–26%        |
| <b>Litter cover</b>      | 47.3%       | 2–97%        |

### **Samples Used to Describe Association (n=8)**

**Rapid Assessments:** SONO0062, SONO0396, SONO0728, SONO0730, SONO0738, SONO0873, SONO0882, SONO0975

**Relevés:** none

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Salix sitchensis* Provisional Association**

n = 8

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>                            |             |  |            |            |            |            |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                     | 38         | 2.7        | 2.0        | 4.0        |
|  | ALRU2       | * <i>Alnus rubra</i>                               | 38         | 1.8        | 0.2        | 5.0        |
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | PSME        | * <i>Pseudotsuga menziesii</i>                     | 38         | 1.1        | 0.2        | 2.2        |
|  | ALRU2       | * <i>Alnus rubra</i>                               | 25         | 0.8        | 0.4        | 1.2        |
| <b>Shrub</b>                           |             |  |            |            |            |            |
|  | SASI2       | <i>Salix sitchensis</i>                            | 100        | 40.7       | 17.0       | 65.0       |
|  | RUUR        | <i>Rubus ursinus</i>                               | 63         | 2.9        | 0.2        | 7.0        |
|  | TODI        | <i>Toxicodendron diversilobum</i>                  | 63         | 1.5        | 0.2        | 5.0        |
|  | RUPA        | <i>Rubus parviflorus</i>                           | 50         | 4.3        | 0.2        | 9.0        |
|  | BAPI        | <i>Baccharis pilularis</i>                         | 50         | 0.4        | 0.2        | 1.0        |
|  | MOCA6       | <i>Morella californica</i>                         | 38         | 2.1        | 0.2        | 5.0        |
|  | LOINL       | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 25         | 9.5        | 2.0        | 17.0       |
|  | SALA6       | <i>Salix lasiolepis</i>                            | 25         | 4.1        | 0.2        | 8.0        |
|  | RISA        | <i>Ribes sanguineum</i>                            | 25         | 1.6        | 0.2        | 3.0        |
|  | HODI        | <i>Holodiscus discolor</i>                         | 25         | 1.1        | 0.2        | 2.0        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | HOLA        | <i>Holcus lanatus</i>                              | 38         | 2.1        | 0.2        | 3.0        |
|  | EQUIS       | <i>Equisetum</i>                                   | 38         | 1.1        | 0.2        | 3.0        |
|  | ATFI        | <i>Athyrium filix-femina</i>                       | 38         | 0.8        | 0.2        | 2.0        |
|  | MEPU        | <i>Mentha pulegium</i>                             | 38         | 0.2        | 0.2        | 0.2        |
|  | SCMI2       | <i>Scirpus microcarpus</i>                         | 25         | 26.0       | 15.0       | 37.0       |
|  | EQTEB       | <i>Equisetum telmateia</i> var. <i>braunii</i>     | 25         | 21.5       | 1.0        | 42.0       |
|  | JUNCU       | <i>Juncus</i>                                      | 25         | 5.1        | 0.2        | 10.0       |
|  | CANU5       | <i>Carex nudata</i>                                | 25         | 4.0        | 1.0        | 7.0        |
|  | WOFI        | <i>Woodwardia fimbriata</i>                        | 25         | 0.6        | 0.2        | 1.0        |
|  | SCCA2       | <i>Scrophularia californica</i>                    | 25         | 0.6        | 0.2        | 1.0        |
| <b>Non-vascular</b>                    |             |  |            |            |            |            |
|  | 2MOSS       | Moss   | 38         | 8.5        | 0.2        | 25.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

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## ***Sambucus nigra* Alliance**

### **Blue elderberry stands**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Sambucus nigra* is dominant in the shrub canopy with *Artemisia californica*, *Baccharis pilularis*, *Baccharis salicifolia*, *Ceanothus megacarpus*, *Diplacus aurantiacus*, *Hazardia squarrosa*, *Heteromeles arbutifolia*, *Malosma laurina*, *Nicotiana glauca*, *Rhus integrifolia*, *Ribes speciosum*, *Rubus* spp., *Salix exigua*, *Salix lasiolepis*, *Toxicodendron diversilobum*, and *Vitis californica*. Emergent trees may be present at low cover, including *Fraxinus latifolia*, *Juglans californica*, *Populus fremontii*, *Quercus agrifolia*, or *Quercus lobata*.

The taxonomy and nomenclature of *Sambucus* varies greatly among references. The *Jepson Manual* (Hickman 1993) treated *Sambucus caerulea* and *S. mexicana* as a single species. The second edition of *The Jepson Manual* uses the name *Sambucus nigra* ssp. *caerulea* to include both *S. caerulea* and *S. mexicana*. Because *S. nigra* ssp. *caerulea* is the only subspecies that grows in California, *Sambucus nigra* is the name used for this alliance.

The *Sambucus nigra* Alliance forms open to moderately dense stands, occurring in a scattered distribution in southern California, the Central Valley, and the northern Central Coast. Stands occur in mesic and disturbed settings, such as along creek and river terraces, in openings on the border of moist forest habitats, and in areas surrounded by drier, more open coastal sage scrub habitat. Most *Sambucus nigra* stands reflect past disturbance patterns through flooding or clearing, however the natural factors maintaining stands are not clear, and stands are not extensive.

#### Sonoma County

*Sambucus nigra* stands are uncommon in the Sonoma County. A single stand was sampled along the Russian River.

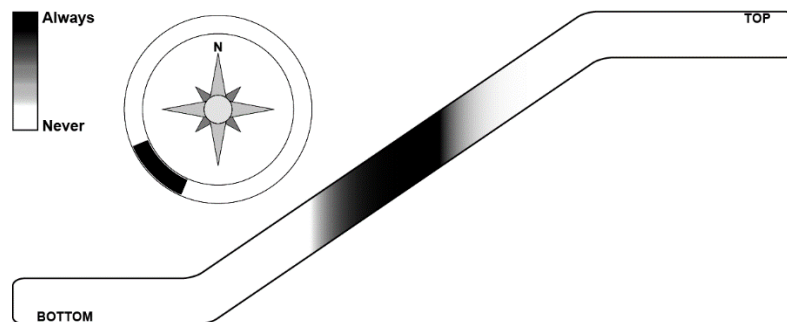
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#### **Local Alliance Summary (n = 1)**

**Elevation:** 1413 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 39.0         | 39            | –          |
| <b>Herb</b>                          | 18.0         | 18            | 0.5–1      |
| <b>Shrub</b>                         | 20.0         | 20            | 2–5        |
| <b>Regenerating/understory tree*</b> | 5.0          | 5             | 2–5        |
| <b>Hardwood</b>                      | 2.0          | 2             | 5–10       |
| <b>Conifer</b>                       | 2.0          | 2             | 10–15      |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 15.0° | 15°   |
| <b>Large rock cover</b>  | 7.0%  | 7%    |
| <b>Small rock cover</b>  | 0.2%  | 0.2%  |
| <b>Bare ground cover</b> | 3.0%  | 3%    |
| <b>Litter cover</b>      | 88.0% | 88%   |

**Associations within this Alliance:**

*Sambucus nigra* Association

**STAND TABLE**

***Sambucus nigra* Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | PISA2  | <i>Pinus sabiniana</i>                                  | 100 | 2.0  | 2.0  | 2.0  |
|  | QUAG   | <i>Quercus agrifolia</i>                                | 100 | 1.0  | 1.0  | 1.0  |
|  | UMCA   | <i>Umbellularia californica</i>                         | 100 | 1.0  | 1.0  | 1.0  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | ACMA3  | <i>Acer macrophyllum</i>                                | 100 | 3.0  | 3.0  | 3.0  |
|  | ARME   | <i>Arbutus menziesii</i>                                | 100 | 1.2  | 1.2  | 1.2  |
|  | QUCH2  | <i>Quercus chrysolepis</i>                              | 100 | 1.2  | 1.2  | 1.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | SANIC5 | <i>Sambucus nigra</i> ssp. <i>cerulea</i>               | 100 | 16.0 | 16.0 | 16.0 |
|  | ERCA6  | <i>Eriodictyon californicum</i>                         | 100 | 2.0  | 2.0  | 2.0  |
|  | ARMAG  | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 100 | 1.0  | 1.0  | 1.0  |
|  | DIAUA  | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 100 | 1.0  | 1.0  | 1.0  |
|  | TODI   | <i>Toxicodendron diversilobum</i>                       | 100 | 1.0  | 1.0  | 1.0  |
|  | RIME   | <i>Ribes menziesii</i>                                  | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | BRDI2  | <i>Brachypodium distachyon</i>                          | 100 | 5.0  | 5.0  | 5.0  |
|  | AVBA   | <i>Avena barbata</i>                                    | 100 | 3.0  | 3.0  | 3.0  |
|  | BRMA   | <i>Briza maxima</i>                                     | 100 | 2.0  | 2.0  | 2.0  |
|  | ELGL   | <i>Elymus glaucus</i>                                   | 100 | 2.0  | 2.0  | 2.0  |
|  | LAVE2  | <i>Lathyrus vestitus</i>                                | 100 | 1.0  | 1.0  | 1.0  |
|  | MECA2  | <i>Melica californica</i>                               | 100 | 1.0  | 1.0  | 1.0  |
|  | METO   | <i>Melica torreyana</i>                                 | 100 | 1.0  | 1.0  | 1.0  |
|  | SANIC  | <i>Sanicula</i>   | 100 | 0.2  | 0.2  | 0.2  |

## ***Sambucus nigra* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 39.0                | 39                   | –                 |
| <b>Herb</b>                          | 18.0                | 18                   | 0.5–1             |
| <b>Shrub</b>                         | 20.0                | 20                   | 2–5               |
| <b>Regenerating/understory tree*</b> | 5.0                 | 5                    | 2–5               |
| <b>Hardwood</b>                      | 2.0                 | 2                    | 5–10              |
| <b>Conifer</b>                       | 2.0                 | 2                    | 10–15             |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** SW (1)

**Macrotopography:** middle 1/3 of slope (1)

**Microtopography:** concave (1)

**Parent material:** sandstone (1)

**Soil texture:** no data

**Slope steepness:** moderate/6-25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 1413 ft.    | 1413 ft.     |
| <b>Slope</b>             | 15.0°       | 15°          |
| <b>Large rock cover</b>  | 7.0%        | 7%           |
| <b>Small rock cover</b>  | 0.2%        | 0.2%         |
| <b>Bare ground cover</b> | 3.0%        | 3%           |
| <b>Litter cover</b>      | 88.0%       | 88%          |

### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0250

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

### **STAND TABLE**

#### ***Sambucus nigra* Association**

n = 1

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Tree</b>                            |             |                                 |            |            |            |            |
|  | PISA2       | <i>Pinus sabiniana</i>          | 100        | 2.0        | 2.0        | 2.0        |
|  | QUAG        | <i>Quercus agrifolia</i>        | 100        | 1.0        | 1.0        | 1.0        |
|  | UMCA        | <i>Umbellularia californica</i> | 100        | 1.0        | 1.0        | 1.0        |
| <b>Regenerating or Understory Tree</b> |             |                                 |            |            |            |            |
|  | ACMA3       | <i>Acer macrophyllum</i>        | 100        | 3.0        | 3.0        | 3.0        |
|  | ARME        | <i>Arbutus menziesii</i>        | 100        | 1.2        | 1.2        | 1.2        |
|  | QUCH2       | <i>Quercus chrysolepis</i>      | 100        | 1.2        | 1.2        | 1.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**STAND TABLE** continued

***Sambucus nigra* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                   | <b>Con</b>                     | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|--------------------------------|------------|------------|------------|
| <b>Shrub</b>    | SANIC5      | <i>Sambucus nigra</i> ssp. <i>cerulea</i>               | 100                            | 16.0       | 16.0       | 16.0       |
|                 | ERCA6       | <i>Eriodictyon californicum</i>                         | 100                            | 2.0        | 2.0        | 2.0        |
|                 | ARMAG       | <i>Arctostaphylos manzanita</i> ssp. <i>glaucescens</i> | 100                            | 1.0        | 1.0        | 1.0        |
|                 | DIAUA       | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i>     | 100                            | 1.0        | 1.0        | 1.0        |
|                 | TODI        | <i>Toxicodendron diversilobum</i>                       | 100                            | 1.0        | 1.0        | 1.0        |
|                 | RIME        | <i>Ribes menziesii</i>                                  | 100                            | 0.2        | 0.2        | 0.2        |
|                 | <b>Herb</b> | BRDI2   | <i>Brachypodium distachyon</i> | 100        | 5.0        | 5.0        |
| AVBA            |             | <i>Avena barbata</i>                                    | 100                            | 3.0        | 3.0        | 3.0        |
| BRMA            |             | <i>Briza maxima</i>                                     | 100                            | 2.0        | 2.0        | 2.0        |
| ELGL            |             | <i>Elymus glaucus</i>                                   | 100                            | 2.0        | 2.0        | 2.0        |
| LAVE2           |             | <i>Lathyrus vestitus</i>                                | 100                            | 1.0        | 1.0        | 1.0        |
| MECA2           |             | <i>Melica californica</i>                               | 100                            | 1.0        | 1.0        | 1.0        |
| METO            |             | <i>Melica torreyana</i>                                 | 100                            | 1.0        | 1.0        | 1.0        |
| SANIC           |             | <i>Sanicula</i>   | 100                            | 0.2        | 0.2        | 0.2        |

***Toxicodendron diversilobum* Alliance**  
**Poison oak scrub**

Statewide (Sawyer et al. 2009)

*Toxicodendron diversilobum* is dominant in the shrub canopy with *Artemisia californica*, *Baccharis pilularis*, *Diplacus aurantiacus*, *Heteromeles arbutifolia*, *Keckiella cordifolia*, *Malosma laurina*, *Philadelphus lewisii*, *Rhamnus ilicifolia*, *Rubus parviflorus*, *Salvia leucophylla*, *Salvia mellifera*, and *Sambucus nigra*. Emergent trees may be present at low cover, including *Juglans californica* or *Quercus agrifolia*.

Sampling in this alliance requires care. Nonetheless, people have sampled it in a variety of settings in southern and central California, from the immediate coastline to dry inland foothills of the Sierra Nevada. Some coastal stands are nearly pure, persistent, and have relatively low diversity. However, some stands are likely to be a consequence of past and frequent fire disturbance, and these can have a high diversity of native herbs and emergent trees. *Toxicodendron diversilobum* grows throughout cismontane California and is found in many low-elevation alliances.

Sonoma County

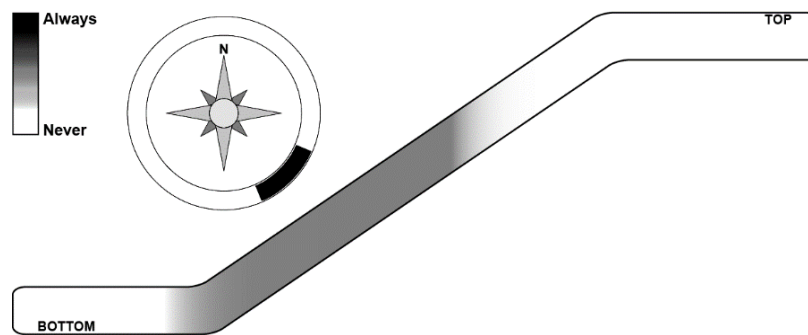
Stands of the *Toxicodendron diversilobum* Alliance overlap with mesic coastal scrub of the *Baccharis pilularis* and *Frangula californica* – *Rhododendron occidentale* Alliances. The larger, mappable stands of *Toxicodendron diversilobum* tend to occur within a few kilometers of the coast on moist sheltered slopes; they are especially notable interspersed with coastal grasslands between the Russian River mouth and Bodega Bay.

**Local Alliance Summary (n = 2)**

**Elevation:** 19–43 ft, mean 31 ft

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 75.0         | 60–90         | –          |
| <b>Herb</b>             | 6.0          | 5–7           | <0.5–2     |
| <b>Shrub</b>            | 70.0         | 50–90         | 1–2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 8.5°  | 0–17°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.0%  | 0–0%   |
| <b>Bare ground cover</b> | 42.0% | 2–82%  |
| <b>Litter cover</b>      | 55.0% | 15–95% |

**Associations within this Alliance:**

*Toxicodendron diversilobum* – *Baccharis pilularis* Provisional Association

**STAND TABLE**

*Toxicodendron diversilobum* Alliance

n = 2

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> | TODI   | <i>Toxicodendron diversilobum</i>                | 100 | 60.0 | 40.0 | 80.0 |
|              | BAPI   | <i>Baccharis pilularis</i>                       | 50  | 10.0 | 10.0 | 10.0 |
|              | RUUR   | <i>Rubus ursinus</i>                             | 50  | 10.0 | 10.0 | 10.0 |
| <b>Herb</b>  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 0.2  | 0.2  | 0.2  |
|              | PLLA   | <i>Plantago lanceolata</i>                       | 50  | 4.0  | 4.0  | 4.0  |
|              | VUBR   | <i>Vulpia bromoides</i>                          | 50  | 3.0  | 3.0  | 3.0  |
|              | HEMA80 | <i>Heracleum maximum</i>                         | 50  | 2.0  | 2.0  | 2.0  |
|              | ANAR   | <i>Anagallis arvensis</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|              | CHPO3  | <i>Chlorogalum pomeridianum</i>                  | 50  | 0.2  | 0.2  | 0.2  |
|              | NAPU4  | <i>Nassella pulchra</i>                          | 50  | 0.2  | 0.2  | 0.2  |

***Toxicodendron diversilobum* – *Baccharis pilularis* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 75.0         | 60–90         | –          |
| <b>Herb</b>                          | 6.0          | 5–7           | <0.5–2     |
| <b>Shrub</b>                         | 70.0         | 50–90         | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** SE (1), variable (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1)

**Microtopography:** convex (1), undulating (1)

**Parent material:** Franciscan melange (1), sedimentary (1)

**Soil texture:** no data

**Slope steepness:** flat/0° (1), moderate/6-25° (1)

|                          | Mean   | Range     |
|--------------------------|--------|-----------|
| <b>Elevation</b>         | 31 ft. | 19–43 ft. |
| <b>Slope</b>             | 8.5°   | 0–17°     |
| <b>Large rock cover</b>  | 0.0%   | 0–0%      |
| <b>Small rock cover</b>  | 0.0%   | 0–0%      |
| <b>Bare ground cover</b> | 42.0%  | 2–82%     |
| <b>Litter cover</b>      | 55.0%  | 15–95%    |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0737, SONO2180

**Relevés:** none

**SCV Global/State Rank:** G3G4?/S3S4?¹

**STAND TABLE**

***Toxicodendron diversilobum* – *Baccharis pilularis* Provisional Association**

n = 2

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | TODI   | <i>Toxicodendron diversilobum</i>                | 100 | 60.0 | 40.0 | 80.0 |
|          | BAPI   | <i>Baccharis pilularis</i>                       | 50  | 10.0 | 10.0 | 10.0 |
|          | RUUR   | <i>Rubus ursinus</i>                             | 50  | 10.0 | 10.0 | 10.0 |
| Herb     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 0.2  | 0.2  | 0.2  |
|          | PLLA   | <i>Plantago lanceolata</i>                       | 50  | 4.0  | 4.0  | 4.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 50  | 3.0  | 3.0  | 3.0  |
|          | HEMA80 | <i>Heracleum maximum</i>                         | 50  | 2.0  | 2.0  | 2.0  |
|          | NAPU4  | <i>Nassella pulchra</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                  | 50  | 0.2  | 0.2  | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

## Herb Alliance Descriptions



This stand represents the *Juncus arcticus* (var. *balticus*, *mexicanus*) Alliance. This photograph was taken along the edge of a pond at Austin Creek State Recreation Area.

***Abronia latifolia* – *Ambrosia chamissonis* Alliance**  
**Dune mat**

Statewide (Sawyer et al. 2009)

*Abronia latifolia* and/or *Ambrosia chamissonis* mix with other perennial herbs, grasses, and low shrubs to form a low canopy with *Abronia maritima*, *Abronia umbellata*, *Achillea millefolium*, *Artemisia pycnocephala*, *Atriplex* spp., *Cakile maritima*, *Calystegia macrostegia*, *Calystegia soldanella*, *Camissonia cheiranthifolia*, *Cardionema ramosissimum*, *Carpobrotus* spp., *Croton californicus*, *Erigeron glaucus*, *Eriogonum latifolium*, *Eriogonum parvifolium*, *Eriophyllum staechadifolium*, *Erysimum* spp., *Fragaria chiloensis*, *Grindelia stricta*, *Lathyrus littoralis*, *Malacothrix incana*, and *Poa douglasii*. Emergent shrubs may be present at low cover, including *Baccharis pilularis*, *Ericameria ericoides*, *Lupinus arboreus*, or *Lupinus chamissonis*.

Plants of the Dune Mat are well adapted to shifts both temporally and spatially as a result of variable environmental conditions. In some areas, local mound-by-mound dominance of *Abronia latifolia*, *Ambrosia chamissonis*, *Artemisia pycnocephala*, *Eriophyllum staechadifolium*, *Poa douglasii*, and other species suggests fine-scale microsite patterning; however, the scale of disturbance and the clonal mat-forming characteristics of many of the major species suggest that stands should be considered on a larger spatial scale. For these reasons, this alliance is presented broadly and variation is described at the association level.

Sonoma County

Dune Mat is localized in areas of coastal sand in Sonoma County. With the exception of the larger active dunes in the vicinity of Bodega Bay, stands of this alliance are small and they are limited to upper beaches and, in some cases, “climbing” dunes or sand sheets blown onto seaward-facing coastal bluffs. Some of the upper beach stands are regularly affected by winter storm waves and have relatively low cover. As a result of the small stand size and the effects of wave action, variation in stand structure and species composition is relatively high.

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**Local Alliance Summary (n = 7)**

**Elevation:** 4–103 ft, mean 29 ft

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

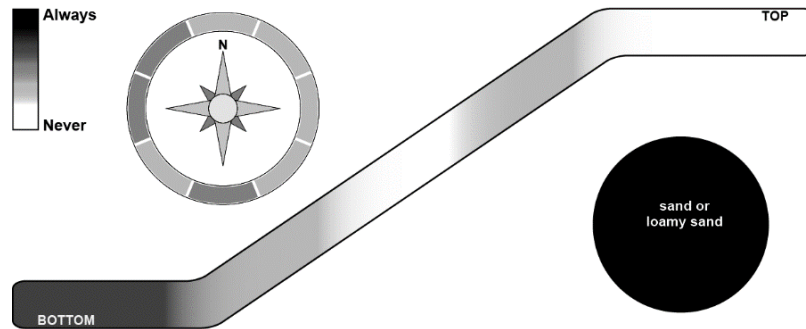
CA rare plant rank: 1B.2

NatureServe global/state rank: G4T2T3/S2S3

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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 16.6         | 1–38          | –          |
| <b>Herb</b>                          | 15.6         | 1–33          | <0.5–0.5   |
| <b>Shrub</b>                         | 1.6          | 0–9           | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 2.6°  | 0–10°  |
| <b>Large rock cover</b>  | 0.2%  | 0–1%   |
| <b>Small rock cover</b>  | 9.5%  | 0–66%  |
| <b>Bare ground cover</b> | 84.3% | 26–99% |
| <b>Litter cover</b>      | 4.9%  | 0–15%  |

**Associations within this Alliance:**

- Ambrosia chamissonis* Provisional Association
- Artemisia pycnocephala* – *Calystegia soldanella* Association
- Artemisia pycnocephala* – *Polygonum paronychia* Association

**STAND TABLE**

***Abronia latifolia* – *Ambrosia chamissonis* Alliance**

n = 7

| Lifeform     | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|--------------|--------|-----------------------------------|-----|------|------|------|
| <b>Shrub</b> | BAPI   | <i>Baccharis pilularis</i>        | 29  | 0.2  | 0.2  | 0.2  |
|              | LUAR   | <i>Lupinus arboreus</i>           | 29  | 0.2  | 0.2  | 0.2  |
|              | RUUR   | <i>Rubus ursinus</i>              | 29  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  | AMCH4  | <i>Ambrosia chamissonis</i>       | 71  | 1.2  | 0.2  | 2.0  |
|              | CAMA   | <i>Cakile maritima</i>            | 57  | 3.8  | 0.2  | 13.0 |
|              | ERLA5  | <i>Eriogonum latifolium</i>       | 43  | 6.4  | 0.2  | 14.0 |
|              | CACH13 | <i>Camissonia cheiranthifolia</i> | 43  | 0.2  | 0.2  | 0.2  |
|              | ARPY3  | <i>Artemisia pycnocephala</i>     | 29  | 13.0 | 10.0 | 16.0 |
|              | AMAR4  | <i>Ammophila arenaria</i>         | 29  | 1.1  | 0.2  | 2.0  |
|              | ABLA2  | <i>Abronia latifolia</i>          | 29  | 0.6  | 0.2  | 1.0  |

**STAND TABLE** continued

***Abronia latifolia* – *Ambrosia chamissonis* Alliance**

n = 7

| Lifeform | Code   | Botanical Name                  | Con | Avg | Min | Max |
|----------|--------|---------------------------------|-----|-----|-----|-----|
| Herb     | CARPO  | <i>Carpobrotus</i>              | 29  | 0.6 | 0.2 | 1.0 |
|          | ANAR   | <i>Anagallis arvensis</i>       | 29  | 0.2 | 0.2 | 0.2 |
|          | ERCI6  | <i>Erodium cicutarium</i>       | 29  | 0.2 | 0.2 | 0.2 |
|          | ESCA2  | <i>Eschscholzia californica</i> | 29  | 0.2 | 0.2 | 0.2 |
|          | HEMA80 | <i>Heracleum maximum</i>        | 29  | 0.2 | 0.2 | 0.2 |
|          | HYRA3  | <i>Hypochaeris radicata</i>     | 29  | 0.2 | 0.2 | 0.2 |
|          | PLLA   | <i>Plantago lanceolata</i>      | 29  | 0.2 | 0.2 | 0.2 |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Ambrosia chamissonis* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 8.5          | 1–15          | –          |
| <b>Herb</b>                          | 8.0          | 1–15          | <0.5–0.5   |
| <b>Shrub</b>                         | 0.6          | 0–2           | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), SE (2), SW (1)

**Macrotopography:** bottom (3), lower 1/3 of slope (1)

**Microtopography:** flat (1), undulating (3)

**Parent material:** mixed rock (1), sand dunes (1), sedimentary (2)

**Soil texture:** sand (2)

**Slope steepness:** flat/0° (1), gentle/1-5° (3)

|                          | Mean   | Range    |
|--------------------------|--------|----------|
| <b>Elevation</b>         | 12 ft. | 4–28 ft. |
| <b>Slope</b>             | 1.0°   | 0–2°     |
| <b>Large rock cover</b>  | 0.3%   | 0–1%     |
| <b>Small rock cover</b>  | 16.5%  | 0–66%    |
| <b>Bare ground cover</b> | 79.0%  | 26–97%   |
| <b>Litter cover</b>      | 3.5%   | 2–7%     |



**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0033

**Relevés:** SONO0036, SONO0753, SONO0754

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Ambrosia chamissonis* Provisional Association**

n = 4

| Lifeform | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|----------|--------|-----------------------------------|-----|------|------|------|
| Shrub    | LUAL4  | <i>Lupinus albifrons</i>          | 25  | 0.2  | 0.2  | 0.2  |
|          | LUAR   | <i>Lupinus arboreus</i>           | 25  | 0.2  | 0.2  | 0.2  |
| Herb     | CAMA   | <i>Cakile maritima</i>            | 100 | 3.8  | 0.2  | 13.0 |
|          | AMCH4  | <i>Ambrosia chamissonis</i>       | 100 | 1.5  | 1.0  | 2.0  |
|          | AMAR4  | <i>Ammophila arenaria</i>         | 50  | 1.1  | 0.2  | 2.0  |
|          | ABUM   | <i>Abronia umbellata</i>          | 25  | 10.0 | 10.0 | 10.0 |
|          | ABLA2  | <i>Abronia latifolia</i>          | 25  | 1.0  | 1.0  | 1.0  |
|          | CACH13 | <i>Camissonia cheiranthifolia</i> | 25  | 0.2  | 0.2  | 0.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>       | 25  | 0.2  | 0.2  | 0.2  |
|          | HEMA80 | <i>Heracleum maximum</i>          | 25  | 0.2  | 0.2  | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>              | 25  | 0.2  | 0.2  | 0.2  |
|          | BRDI3  | <i>Bromus diandrus</i>            | 25  | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>         | 25  | 0.2  | 0.2  | 0.2  |
|          | CARPO  | <i>Carpobrotus</i>                | 25  | 0.2  | 0.2  | 0.2  |
|          | ERC16  | <i>Erodium cicutarium</i>         | 25  | 0.2  | 0.2  | 0.2  |

***Artemisia pycnocephala* – *Calystegia soldanella* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 22.0         | 22            | –          |
| <b>Herb</b>                          | 22.0         | 22            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)

**Macrotopography:** bottom (1)

**Microtopography:** undulating (1)

**Parent material:** sand dunes (1)

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Summary of Environmental Data, continued**

**Soil texture:** sand (1)

**Slope steepness:** gentle/1-5° (1)

|                          | Mean   | Range  |
|--------------------------|--------|--------|
| <b>Elevation</b>         | 22 ft. | 22 ft. |
| <b>Slope</b>             | 3.0°   | 3°     |
| <b>Large rock cover</b>  | 0.0%   | 0%     |
| <b>Small rock cover</b>  | 0.0%   | 0%     |
| <b>Bare ground cover</b> | 99.0%  | 99%    |
| <b>Litter cover</b>      | 0.2%   | 0.2%   |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** SONO0450

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Artemisia pycnocephala* – *Calystegia soldanella* Association**

n = 1

| Lifeform | Code   | Botanical Name                    | Con | Avg  | Min  | Max  |
|----------|--------|-----------------------------------|-----|------|------|------|
| Herb     |        |                                   |     |      |      |      |
|          | ARPY3  | <i>Artemisia pycnocephala</i>     | 100 | 16.0 | 16.0 | 16.0 |
|          | ERLA5  | <i>Eriogonum latifolium</i>       | 100 | 5.0  | 5.0  | 5.0  |
|          | AMCH4  | <i>Ambrosia chamissonis</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | ABLA2  | <i>Abronia latifolia</i>          | 100 | 0.2  | 0.2  | 0.2  |
|          | CASO2  | <i>Calystegia soldanella</i>      | 100 | 0.2  | 0.2  | 0.2  |
|          | CACH13 | <i>Camissonia cheiranthifolia</i> | 100 | 0.2  | 0.2  | 0.2  |

***Artemisia pycnocephala* – *Polygonum paronychia* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 38.0         | 38            | –          |
| <b>Herb</b>                          | 33.0         | 33            | <0.5–0.5   |
| <b>Shrub</b>                         | 9.0          | 9             | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)

**Macrotopography:** upper 1/3 of slope (1)

**Microtopography:** convex (1)

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data, continued**

**Parent material:** Franciscan melange (1)

**Soil texture:** no data

**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 103 ft. | 103 ft. |
| <b>Slope</b>             | 10.0°   | 10°     |
| <b>Large rock cover</b>  | 0.0%    | 0%      |
| <b>Small rock cover</b>  | 0.0%    | 0%      |
| <b>Bare ground cover</b> | 82.0%   | 82%     |
| <b>Litter cover</b>      | 15.0%   | 15%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** SONO0032

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Artemisia pycnocephala* – *Polygonum paronychia* Association**

n = 1

| Lifeform     | Code                        | Botanical Name                                | Con | Avg  | Min  | Max  |
|--------------|-----------------------------|---|-----|------|------|------|
| <b>Shrub</b> | BAPI                        | <i>Baccharis pilularis</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|              | LUAR                        | <i>Lupinus arboreus</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|              | RUUR                        | <i>Rubus ursinus</i>                          | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  | ARPY3                       | <i>Artemisia pycnocephala</i>                 | 100 | 10.0 | 10.0 | 10.0 |
|              | ERGL3                       | <i>Erigeron glaucus</i>                       | 100 | 5.0  | 5.0  | 5.0  |
|              | ERST9                       | <i>Eriophyllum stoechadifolium</i>            | 100 | 4.0  | 4.0  | 4.0  |
|              | STACH                       | <i>Stachys</i>                                | 100 | 1.0  | 1.0  | 1.0  |
|              | CARPO                       | <i>Carpobrotus</i>                            | 100 | 1.0  | 1.0  | 1.0  |
|              | ERFR3                       | <i>Erysimum franciscanum</i>                  | 100 | 1.0  | 1.0  | 1.0  |
|              | PHCA                        | <i>Phacelia californica</i>                   | 100 | 1.0  | 1.0  | 1.0  |
|              | GERAN                       | <i>Geranium</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|              | PTDR                        | <i>Pterostegia drymarioides</i>               | 100 | 0.2  | 0.2  | 0.2  |
|              | RACA2                       | <i>Ranunculus californicus</i>                | 100 | 0.2  | 0.2  | 0.2  |
|              | POCA26                      | <i>Polypodium calirhiza</i>                   | 100 | 0.2  | 0.2  | 0.2  |
|              | POPA7                       | <i>Polygonum paronychia</i>                   | 100 | 0.2  | 0.2  | 0.2  |
|              | PLLA                        | <i>Plantago lanceolata</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|              | ACMI2                       | <i>Achillea millefolium</i>                   | 100 | 0.2  | 0.2  | 0.2  |
|              | HEMA80                      | <i>Heracleum maximum</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|              | DUFA                        | <i>Dudleya farinosa</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|              | GAAP2                       | <i>Galium aparine</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|              | FRAF2                       | <i>Fritillaria affinis</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|              | EUPE6                       | <i>Euphorbia peplus</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|              | CAAF2                       | <i>Castilleja affinis</i> ssp. <i>affinis</i> | 100 | 0.2  | 0.2  | 0.2  |
| HYRA3        | <i>Hypochaeris radicata</i> | 100   | 0.2 | 0.2  | 0.2  |      |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Artemisia pycnocephala* – *Polygonum paronychia* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | CLPE        | <i>Claytonia perfoliata</i>                      | 100        | 0.2        | 0.2        | 0.2        |
|                 | ESCA2       | <i>Eschscholzia californica</i>                  | 100        | 0.2        | 0.2        | 0.2        |
|                 | CAOL        | <i>Cardamine oligosperma</i>                     | 100        | 0.2        | 0.2        | 0.2        |
|                 | CACA39      | <i>Cardamine californica</i>                     | 100        | 0.2        | 0.2        | 0.2        |
|                 | CAPUS       | <i>Calystegia purpurata</i> ssp. <i>saxicola</i> | 100        | 0.2        | 0.2        | 0.2        |
|                 | BRMA5       | <i>Bromus maritimus</i>                          | 100        | 0.2        | 0.2        | 0.2        |
|                 | ARMAC2      | <i>Armeria maritima</i> ssp. <i>californica</i>  | 100        | 0.2        | 0.2        | 0.2        |
|                 | ANGEL       | <i>Angelica</i>                                  | 100        | 0.2        | 0.2        | 0.2        |
|                 | ERLA5       | <i>Eriogonum latifolium</i>                      | 100        | 0.2        | 0.2        | 0.2        |
|                 | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100        | 0.2        | 0.2        | 0.2        |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

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***Agrostis (gigantea, stolonifera) – Festuca arundinacea* Semi-Natural Alliance**  
**Bent grass – tall fescue meadows**

Statewide (Sawyer et al. 2009)

*Agrostis gigantea*, *Agrostis stolonifera* and/or *Festuca arundinacea* are dominant or co-dominant in the herbaceous layer.

All three grasses are native to Europe and are planted throughout temperate North America as pasture forage grasses. Stands occur in brackish marshes, wet brackish pastures, drainage ditches, meadows, and agricultural wetlands in much of California. Once established, these species can invade open, natural vegetation and displace native species, including *Achillea millefolium*, *Alopecurus aequalis*, *Argentina egedii*, *Carex microptera*, *Eleocharis macrostachya*, *Hordeum brachyantherum*, *Juncus arcticus*, *J. lescurii*, and *Symphotrichum ascendens*. Stands typically have low floristic diversity and are of low wildlife value.

Sonoma County

This alliance of ecologically similar perennial non-native grasses owes its existence to pasture grass plantings or inadvertent introduction through feed and hay. Summer fog reduces evapotranspiration in unirrigated stands on coastal terraces and fog drip enhances the available moisture during the summer months. These rhizomatous grasses form a turf in some actively grazed pastures along the immediate coast. The single stand sampled occurred within a regularly mowed and grazed field near Valley Ford in southwest Sonoma County.

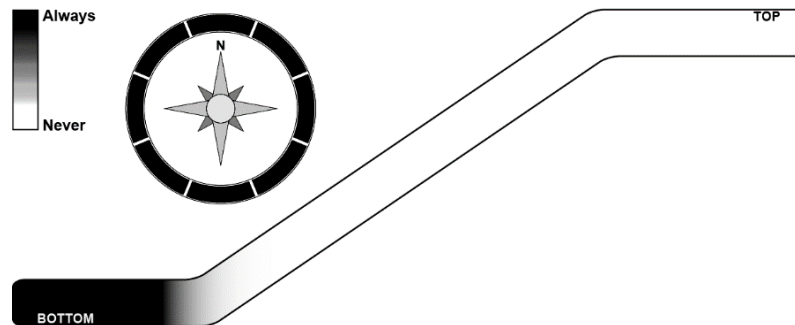
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**Local Alliance Summary (n = 1)**

**Elevation:** 50 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 95.0         | 95            | –          |
| <b>Herb</b>                          | 95.0         | 95            | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 68.0% | 68%   |
| <b>Litter cover</b>      | 30.0% | 30%   |

**Associations within this alliance:**

*Festuca arundinacea* Provisional Semi-Natural Association

**STAND TABLE**

***Agrostis (gigantea, stolonifera) – Festuca arundinacea* Semi-Natural Alliance**

n = 1

| Lifeform | Code   | Botanical Name             | Con | Avg  | Min  | Max  |
|----------|--------|----------------------------|-----|------|------|------|
| Herb     |        |                            |     |      |      |      |
|          | 2FEAR3 | <i>Festuca arundinacea</i> | 100 | 90.0 | 90.0 | 90.0 |
|          | LOPE   | <i>Lolium perenne</i>      | 100 | 4.0  | 4.0  | 4.0  |
|          | COMA2  | <i>Conium maculatum</i>    | 100 | 2.0  | 2.0  | 2.0  |
|          | CIVU   | <i>Cirsium vulgare</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | CONVO  | <i>Convolvulus</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | POA    | <i>Poa</i>                 | 100 | 0.2  | 0.2  | 0.2  |
|          | RUMEX  | <i>Rumex</i>               | 100 | 0.2  | 0.2  | 0.2  |

***Festuca arundinacea* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 95.0         | 95            | –          |
| <b>Herb</b>                          | 95.0         | 95            | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

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**Summary of Environmental Data**

**Aspect:** flat (1)  
**Macrotopography:** bottom (1)  
**Microtopography:** flat (1)  
**Parent material:** sandstone (1)  
**Soil texture:** no data  
**Slope steepness:** flat/0° (1)

|                          | Mean   | Range  |
|--------------------------|--------|--------|
| <b>Elevation</b>         | 50 ft. | 50 ft. |
| <b>Slope</b>             | 0.0°   | 0°     |
| <b>Large rock cover</b>  | 0.0%   | 0%     |
| <b>Small rock cover</b>  | 0.0%   | 0%     |
| <b>Bare ground cover</b> | 68.0%  | 68%    |
| <b>Litter cover</b>      | 30.0%  | 30%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO0679

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Festuca arundinacea* Provisional Semi-Natural Association**

n = 1

| Lifeform | Code   | Botanical Name             | Con | Avg  | Min  | Max  |
|----------|--------|----------------------------|-----|------|------|------|
| Herb     |        |                            |     |      |      |      |
|          | 2FEAR3 | <i>Festuca arundinacea</i> | 100 | 90.0 | 90.0 | 90.0 |
|          | LOPE   | <i>Lolium perenne</i>      | 100 | 4.0  | 4.0  | 4.0  |
|          | COMA2  | <i>Conium maculatum</i>    | 100 | 2.0  | 2.0  | 2.0  |
|          | POA    | <i>Poa</i>                 | 100 | 0.2  | 0.2  | 0.2  |
|          | CONVO  | <i>Convolvulus</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | RUMEX  | <i>Rumex</i>               | 100 | 0.2  | 0.2  | 0.2  |

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***Allium falcifolium* – *Eriogonum* spp. – *Streptanthus* spp. Provisional Alliance**  
**Sickle-leaf onion – wild buckwheat – jewel-flower serpentine barrens**

Statewide

Species composition of this newly defined alliance is variable, but usually includes one or more species of *Allium* (especially *Allium falcifolium* and *A. cratericola*), annual or perennial *Eriogonum* spp., and *Streptanthus* spp. Cover is typically sparse, generally < 5%, and is characterized by annual and perennial herbs and low sub-shrubs. Other larger woody shrub species are widely scattered and may include *Quercus durata*, *Arctostaphylos* spp., and *Ceanothus* spp. (particularly *C. jepsonii* or *C. cuneatus*). Occasional emergent trees of *Hesperocyparis* spp., *Pinus sabiniana*, *P. attenuata*, or *P. Jeffreyi* may be present.

Stands are restricted to serpentine, peridotite, dunite, or other ultramafic substrates that are characteristically high in magnesium and low in calcium, and often include chromium, nickel, mercury, and other chemically harsh elements. The combination of a substrate toxic to most plants and a location on frequently unstable talus or scree slopes (often called barrens) makes these landscapes poorly vegetated, but rich in serpentine-tolerant endemic plants. All major serpentine regions within the state contain such barrens. However, there is insufficient vegetation data to characterize all of them.

Sonoma County

Stands of the *Allium falcifolium* – *Eriogonum* spp. – *Streptanthus* spp. Provisional Alliance are most common and extensive in The Cedars and are occasional in interior Sonoma County in the vicinity of The Geysers and other isolated serpentine outcrops. The provisional association found in Sonoma County is characterized by two species found largely in the serpentine belts of the North Coast Ranges of California, *Eriogonum luteolum* var. *luteolum* and *Streptanthus morrisonii*. In addition to the nominate species, this association also contains *Eriogonum cedrorum*, an endemic known only from The Cedars locality. Other widespread species of the alliance, such as *Asclepias solanoana* and *Allium falcifolium*, also occur in stands of the *Eriogonum luteolum* – *Streptanthus morrisonii* Provisional Association.

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**Local Alliance Summary (n = 7)**

**Elevation:** 930–683 ft, mean 1253 ft

**SCV Global/State Rank:** G2G3?/S2S3?<sup>1</sup>

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2T2/S2

*Calochortus raichei*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

*Eriogonum cedrorum*

CA rare plant rank: 1B.3

NatureServe global/state rank: G1/S1

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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



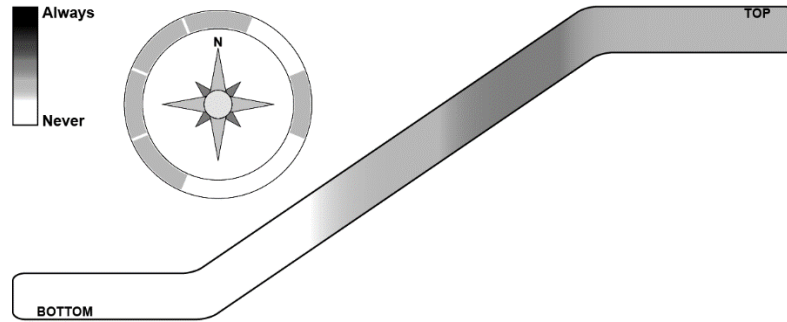
**Noteworthy Taxa, continued**

*Streptanthus morrisonii* ssp. *morrisonii*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2T2/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 1.2          | 0–2           | –          |
| <b>Herb</b>                          | 1.1          | 0–2           | <0.5–0.5   |
| <b>Shrub</b>                         | 0.3          | 0.2–1         | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 0.5–2      |
| <b>Hardwood</b>                      | 0.0          | 0–0           | 2–5        |
| <b>Conifer</b>                       | 0.1          | 0–0.2         | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 33.0° | 28–42° |
| <b>Large rock cover</b>  | 17.8% | 0–31%  |
| <b>Small rock cover</b>  | 77.5% | 59–93% |
| <b>Bare ground cover</b> | 3.3%  | 0–8%   |
| <b>Litter cover</b>      | 1.6%  | 0–9%   |

**Associations within this Alliance:**

*Eriogonum luteolum* – *Streptanthus morrisonii* Provisional Association

**STAND TABLE**

*Allium falcifolium* – *Eriogonum* spp. – *Streptanthus* spp. Provisional Alliance

n = 7

| Lifeform                               | Code   | Botanical Name                    | Con | Avg | Min | Max |
|--|--------|-----------------------------------|-----|-----|-----|-----|
| <b>Tree</b>                            | HESA17 | * <i>Hesperocyparis sargentii</i> | 43  | 0.2 | 0.2 | 0.2 |
| <b>Regenerating or Understory Tree</b> | HESA17 | * <i>Hesperocyparis sargentii</i> | 29  | 0.3 | 0.2 | 0.4 |
| <b>Shrub</b>                           | QUDU4  | <i>Quercus durata</i>             | 43  | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Allium falcifolium* – *Eriogonum* spp. – *Streptanthus* spp. Provisional Alliance**

n = 7

| Lifeform     | Code   | Botanical Name                 | Con | Avg | Min | Max |
|--------------|--------|--------------------------------|-----|-----|-----|-----|
| Shrub        | ARBA4  | <i>Arctostaphylos bakeri</i>   | 29  | 0.2 | 0.2 | 0.2 |
|              | ARVI4  | <i>Arctostaphylos viscida</i>  | 29  | 0.2 | 0.2 | 0.2 |
| Herb         | ERLU5  | <i>Eriogonum luteolum</i>      | 100 | 0.3 | 0.2 | 1.0 |
|              | STMO3  | <i>Streptanthus morrisonii</i> | 86  | 0.3 | 0.2 | 1.0 |
|              | ASDE6  | <i>Aspidotis densa</i>         | 71  | 0.4 | 0.2 | 1.0 |
|              | IRMA   | <i>Iris macrosiphon</i>        | 57  | 0.2 | 0.2 | 0.2 |
|              | PHCO3  | <i>Phacelia corymbosa</i>      | 57  | 0.2 | 0.2 | 0.2 |
|              | 2JMERC | <i>Eriogonum cedrorum</i>      | 43  | 0.5 | 0.2 | 1.0 |
|              | ASSO   | <i>Asclepias solanoana</i>     | 43  | 0.2 | 0.2 | 0.2 |
|              | ALFA3  | <i>Allium falcifolium</i>      | 29  | 0.2 | 0.2 | 0.2 |
|              | ERNU3  | <i>Eriogonum nudum</i>         | 29  | 0.2 | 0.2 | 0.2 |
| Non-vascular | 2LICHN | Lichen                         | 29  | 0.2 | 0.2 | 0.2 |

**Noteworthy Taxa**

- Arctostaphylos bakeri* ssp. *sublaevis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2T2/S2
- Calochortus raichei*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2
- Eriogonum cedrorum*  
CA rare plant rank: 1B.3  
NatureServe Global/State rank: G1/S1
- Streptanthus morrisonii* ssp. *morrisonii*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2T2/S2

***Eriogonum luteolum* – *Streptanthus morrisonii* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (7) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 1.2          | 0–2           | –          |
| Herb                          | 1.1          | 0–2           | <0.5–0.5   |
| Shrub                         | 0.3          | 0.2–1         | 0.5–2      |
| Regenerating/understory tree* | 0.1          | 0–0.2         | 0.5–2      |
| Hardwood                      | 0.0          | 0–0           | 2–5        |
| Conifer                       | 0.1          | 0–0.2         | 2–15       |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** NE (2), NW (3), SW (1), variable (1)  
**Macrotopography:** middle 1/3 of slope (2), ridge top (1), upper 1/3 of slope (4)  
**Microtopography:** concave (1), convex (3), undulating (3)  
**Parent material:** serpentine (7)  
**Soil texture:** no data  
**Slope steepness:** steep/>25° (7)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1253 ft. | 930–1683 ft. |
| <b>Slope</b>             | 33.0°    | 28–42°       |
| <b>Large rock cover</b>  | 17.8%    | 0–31%        |
| <b>Small rock cover</b>  | 77.5%    | 59–93%       |
| <b>Bare ground cover</b> | 3.3%     | 0–8%         |
| <b>Litter cover</b>      | 1.6%     | 0–9%         |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** SONO0242, SONO0243, SONO0265, SONO0267, SONO0270, SONO2217, SONO2219

**Relevés:** none

**SCV Global/State Rank:** G2/S2<sup>1</sup>

**STAND TABLE**

***Eriogonum luteolum* – *Streptanthus morrisonii* Provisional Association**

n = 7

| Lifeform                               | Code   | Botanical Name                    | Con | Avg | Min | Max |
|--|--------|-----------------------------------|-----|-----|-----|-----|
| <b>Tree</b>                            |        |                                   |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 43  | 0.2 | 0.2 | 0.2 |
| <b>Regenerating or Understory Tree</b> |        |                                   |     |     |     |     |
|  | HESA17 | * <i>Hesperocyparis sargentii</i> | 29  | 0.3 | 0.2 | 0.4 |
| <b>Shrub</b>                           |        |                                   |     |     |     |     |
|  | QUDU4  | <i>Quercus durata</i>             | 43  | 0.2 | 0.2 | 0.2 |
|  | ARBA4  | <i>Arctostaphylos bakeri</i>      | 29  | 0.2 | 0.2 | 0.2 |
|  | ARVI4  | <i>Arctostaphylos viscida</i>     | 29  | 0.2 | 0.2 | 0.2 |
| <b>Herb</b>                            |        |                                   |     |     |     |     |
|  | ERLU5  | <i>Eriogonum luteolum</i>         | 100 | 0.3 | 0.2 | 1.0 |
|  | STMO3  | <i>Streptanthus morrisonii</i>    | 86  | 0.3 | 0.2 | 1.0 |
|  | ASDE6  | <i>Aspidotis densa</i>            | 71  | 0.4 | 0.2 | 1.0 |
|  | IRMA   | <i>Iris macrosiphon</i>           | 57  | 0.2 | 0.2 | 0.2 |
|  | PHCO3  | <i>Phacelia corymbosa</i>         | 57  | 0.2 | 0.2 | 0.2 |
|  | 2JMERC | <i>Eriogonum cedrorum</i>         | 43  | 0.5 | 0.2 | 1.0 |
|  | ASSO   | <i>Asclepias solanoana</i>        | 43  | 0.2 | 0.2 | 0.2 |
|  | ERNU3  | <i>Eriogonum nudum</i>            | 29  | 0.2 | 0.2 | 0.2 |
|  | ALFA3  | <i>Allium falcifolium</i>         | 29  | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Eriogonum luteolum* – *Streptanthus morrisonii* Provisional Association**

n = 7

| Lifeform            | Code   | Botanical Name | Con | Avg | Min | Max |
|---------------------|--------|----------------|-----|-----|-----|-----|
| <b>Non-vascular</b> |        |                |     |     |     |     |
|                     | 2LICHN | Lichen         | 29  | 0.2 | 0.2 | 0.2 |

**Noteworthy Taxa**

*Arctostaphylos bakeri* ssp. *sublaevis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

*Calochortus raichei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Eriogonum cedrorum*

CA rare plant rank: 1B.3

NatureServe Global/State rank: G1/S1

*Streptanthus morrisonii* ssp. *morrisonii*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2T2/S2

***Ammophila arenaria* Semi-Natural Alliance**  
 European beach grass swards

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Ammophila arenaria* is dominant in the herbaceous layer. Emergent shrubs may be present at low cover, including *Baccharis pilularis* or *Lupinus arboreus*.

*Ammophila arenaria* is now the predominant vegetation type in many dune systems along the Pacific coast from Ventura County to British Columbia. Many habitat changes occur with its presence: dune stabilization, alteration of dune morphology, reduction in native stands of the *Abronia latifolia* – *Ambrosia chamissonis*, *Leymus mollis*, and other alliances, and a reduction in habitat for both rare animals (e.g., snowy plover, *Charadrius alexandrinus*) and rare plants (e.g., *Erysimum menziesii* ssp. *eurekaense* and *Layia carnosa*, both listed as California rare plants with a rank of 1B.1). See Apteckar 2000, Boyd 1992, Pickart and Barbour 2007, and Pickart and Sawyer 1998.

Sonoma County

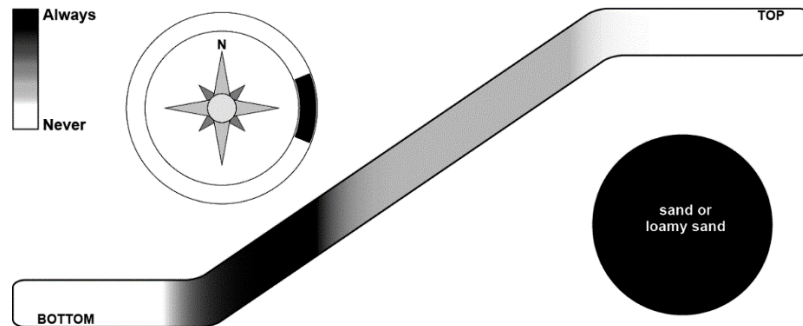
*Ammophila arenaria* stands have dominated the large coastal dune-field at Bodega State Beach and have allowed little room for native Dune Mat stands. Few, if any, other major stands of this non-native grass exist in the County.

**Local Alliance Summary (n = 4)**

**Elevation:** 8–114 ft, mean 45 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 29.8         | 15–39         | –          |
| <b>Herb</b>                          | 28.3         | 15–35         | 0.5–2      |
| <b>Shrub</b>                         | 2.8          | 0–11          | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 0.5–1      |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 3.0°  | 3°     |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.0%  | 0–0%   |
| Bare ground cover | 78.3% | 59–92% |
| Litter cover      | 17.5% | 2–38%  |

**Associations within this Alliance:**

*Ammophila arenaria* Semi-Natural Association

**STAND TABLE**

***Ammophila arenaria* Semi-Natural Alliance**

n = 4

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | HEMA22 | <i>Hesperocyparis macrocarpa</i>                        | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | BAPI   | <i>Baccharis pilularis</i>                              | 50  | 5.1  | 0.2  | 10.0 |
|  | LUAR   | <i>Lupinus arboreus</i>                                 | 50  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AMAR4  | <i>Ammophila arenaria</i>                               | 100 | 25.3 | 15.0 | 30.0 |
|  | CAED3  | <i>Carpobrotus edulis</i>                               | 75  | 2.8  | 0.1  | 8.0  |
|  | PSST7  | <i>Pseudognaphalium stramineum</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|  | LOHE   | <i>Lotus heermannii</i>                                 | 25  | 1.0  | 1.0  | 1.0  |
|  | PETR7  | <i>Pentagramma triangularis</i>                         | 25  | 1.0  | 1.0  | 1.0  |
|  | ACMI2  | <i>Achillea millefolium</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|  | AICA   | <i>Aira caryophyllea</i>                                | 25  | 0.2  | 0.2  | 0.2  |
|  | AIPR   | <i>Aira praecox</i>                                     | 25  | 0.2  | 0.2  | 0.2  |
|  | CAMIS  | <i>Camissonia</i>                                       | 25  | 0.2  | 0.2  | 0.2  |
|  | CAMI22 | <i>Camissonia micrantha</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|  | HYRA3  | <i>Hypochaeris radicata</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|  | LASE   | <i>Lactuca serriola</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | POTET2 | <i>Polycarpon tetraphyllum</i> ssp. <i>tetraphyllum</i> | 25  | 0.2  | 0.2  | 0.2  |
|  | PSRA5  | <i>Pseudognaphalium ramosissimum</i>                    | 25  | 0.2  | 0.2  | 0.2  |
|  | PTDR   | <i>Pterostegia drymarioides</i>                         | 25  | 0.2  | 0.2  | 0.2  |
|  | VUBR   | <i>Vulpia bromoides</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | COCA5  | <i>Conyza canadensis</i>                                | 25  | 0.1  | 0.1  | 0.1  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2MOSS  | Moss  | 25  | 8.0  | 8.0  | 8.0  |
|  | 2CRYPT | Cryptogamic crust                                       | 25  | 4.0  | 4.0  | 4.0  |

***Ammophila arenaria* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (4) USDA Ecological Subsection (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 29.8         | 15–39         | –          |
| <b>Herb</b>                          | 28.3         | 15–35         | 0.5–2      |
| <b>Shrub</b>                         | 2.8          | 0–11          | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 0.5–1      |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), variable (3)

**Macrotopography:** lower 1/3 of slope (3), lower to upper 1/3 of slope (1)

**Microtopography:** convex (1), undulating (3)

**Parent material:** sand dunes (2), sandstone (2)

**Soil texture:** sand (4)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (3)

|                          | Mean   | Range     |
|--------------------------|--------|-----------|
| <b>Elevation</b>         | 45 ft. | 8–114 ft. |
| <b>Slope</b>             | 3.0°   | 3°        |
| <b>Large rock cover</b>  | 0.0%   | 0–0%      |
| <b>Small rock cover</b>  | 0.0%   | 0–0%      |
| <b>Bare ground cover</b> | 78.3%  | 59–92%    |
| <b>Litter cover</b>      | 17.5%  | 2–38%     |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0031

**Relevés:** SONO0028, SONO0029, SONO0107

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Ammophila arenaria* Semi-Natural Association**

n = 4

| Lifeform                               | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | HEMA22 | <i>Hesperocyparis macrocarpa</i>                        | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           |        |   |     |      |      |      |
|  | BAPI   | <i>Baccharis pilularis</i>                              | 50  | 5.1  | 0.2  | 10.0 |
|  | LUAR   | <i>Lupinus arboreus</i>                                 | 50  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | AMAR4  | <i>Ammophila arenaria</i>                               | 100 | 25.3 | 15.0 | 30.0 |
|  | CAED3  | <i>Carpobrotus edulis</i>                               | 75  | 2.8  | 0.1  | 8.0  |
|  | PSST7  | <i>Pseudognaphalium stramineum</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|  | PETR7  | <i>Pentagramma triangularis</i>                         | 25  | 1.0  | 1.0  | 1.0  |
|  | LOHE   | <i>Lotus heermannii</i>                                 | 25  | 1.0  | 1.0  | 1.0  |
|  | LASE   | <i>Lactuca serriola</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | VUBR   | <i>Vulpia bromoides</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|  | PSRA5  | <i>Pseudognaphalium ramosissimum</i>                    | 25  | 0.2  | 0.2  | 0.2  |
|  | ACMI2  | <i>Achillea millefolium</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|  | POTET2 | <i>Polycarpon tetraphyllum</i> ssp. <i>tetraphyllum</i> | 25  | 0.2  | 0.2  | 0.2  |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Ammophila arenaria* Semi-Natural Association**

n = 4

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                 |            |            |            |            |
|                     | HYRA3       | <i>Hypochaeris radicata</i>     | 25         | 0.2        | 0.2        | 0.2        |
|                     | CAMI22      | <i>Camissonia micrantha</i>     | 25         | 0.2        | 0.2        | 0.2        |
|                     | CAMIS       | <i>Camissonia</i>               | 25         | 0.2        | 0.2        | 0.2        |
|                     | PTDR        | <i>Pterostegia drymarioides</i> | 25         | 0.2        | 0.2        | 0.2        |
|                     | AICA        | <i>Aira caryophyllea</i>        | 25         | 0.2        | 0.2        | 0.2        |
|                     | AIPR        | <i>Aira praecox</i>             | 25         | 0.2        | 0.2        | 0.2        |
|                     | COCA5       | <i>Conyza canadensis</i>        | 25         | 0.1        | 0.1        | 0.1        |
| <b>Non-vascular</b> |             |                                 |            |            |            |            |
|                     | 2MOSS       | Moss                            | 25         | 8.0        | 8.0        | 8.0        |
|                     | 2CRYPT      | Cryptogammic crust              | 25         | 4.0        | 4.0        | 4.0        |



**Argentina egedii Alliance**  
**Pacific silverweed marshes**

Statewide (Sawyer et al. 2009)

*Argentina egedii* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Alopecurus aequalis*, *Anemopsis californica*, *Atriplex californica*, *Atriplex prostrata*, *Bolboschoenus maritimus*, *Carex obnupta*, *Carex pansa*, *Chenopodium foliosum*, *Cotula coronopifolia*, *Distichlis spicata*, *Eleocharis macrostachya*, *Epilobium ciliatum*, *Glaux maritima*, *Holcus lanatus*, *Juncus arcticus*, *Juncus bolanderi*, *Lolium perenne*, *Lotus corniculatus*, *Lotus uliginosus*, *Oenanthe sarmentosa*, *Polypogon monspeliensis*, *Rumex conglomeratus*, *Rumex crispus*, *Schoenoplectus* spp., and *Triglochin* spp.

This alliance is closely allied with the *Juncus arcticus* and *Juncus lescurii* Alliances, growing at the brackish interface between salty and freshwater lagoons.

Sonoma County

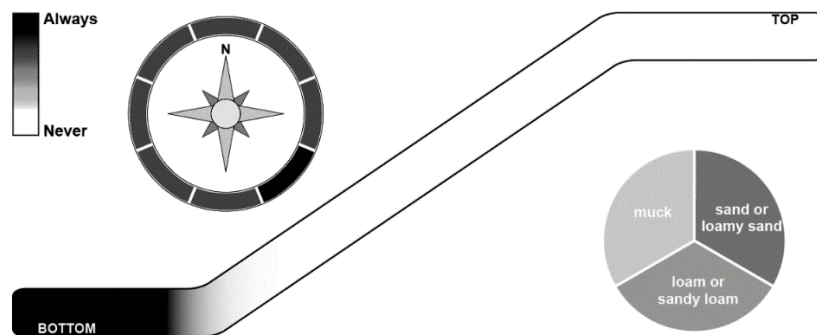
*Argentina egedii* stands are uncommon in the county and are limited to the mouths of coastal creeks and rivers. Most stands are smaller than 0.5 ha. *Argentina egedii* stands often share species with not only *Juncus* spp. Alliances, but also with other closely related wetland alliances such as *Carex obnupta* and *Oenanthe sarmentosa*. This suggests a possible future combination of several of these alliances into a more simplified alliance when more data becomes available. Mapping of all of these coastal wetland alliances will be done at the Group or Macrogroup level.

**Local Alliance Summary (n = 4)**

**Elevation:** 8–20 ft, mean 14 ft

**SCV Global/State Rank:** G4/S2<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 55.5         | 21–85         | –          |
| <b>Herb</b>             | 55.5         | 21–85         | 0.5–2      |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 0.5°  | 0–2°  |
| Large rock cover  | 0.0%  | 0–0%  |
| Small rock cover  | 0.3%  | 0–1%  |
| Bare ground cover | 6.3%  | 0–20% |
| Litter cover      | 65.8% | 0–96% |

**Associations within this Alliance:**

*Argentina egedii* Association

**STAND TABLE**

***Argentina egedii* Alliance**

n = 4

| Lifeform | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|-------|--------------------------------|-----|------|------|------|
| Herb     |       |                                |     |      |      |      |
|          | AREG  | <i>Argentina egedii</i>        | 100 | 39.8 | 18.0 | 61.0 |
|          | JULE  | <i>Juncus lesueurii</i>        | 75  | 8.3  | 5.0  | 15.0 |
|          | DISP  | <i>Distichlis spicata</i>      | 50  | 5.1  | 0.2  | 10.0 |
|          | BOMA7 | <i>Bolboschoenus maritimus</i> | 25  | 24.0 | 24.0 | 24.0 |
|          | HOLA  | <i>Holcus lanatus</i>          | 25  | 18.0 | 18.0 | 18.0 |
|          | LOCO6 | <i>Lotus corniculatus</i>      | 25  | 6.0  | 6.0  | 6.0  |
|          | AGST2 | <i>Agrostis stolonifera</i>    | 25  | 3.0  | 3.0  | 3.0  |
|          | DEBE2 | <i>Deschampsia beringensis</i> | 25  | 3.0  | 3.0  | 3.0  |
|          | FRSA  | <i>Frankenia salina</i>        | 25  | 2.0  | 2.0  | 2.0  |
|          | GAAP2 | <i>Galium aparine</i>          | 25  | 2.0  | 2.0  | 2.0  |
|          | JACA4 | <i>Jaumea carnosa</i>          | 25  | 2.0  | 2.0  | 2.0  |
|          | RUCR  | <i>Rumex crispus</i>           | 25  | 1.0  | 1.0  | 1.0  |
|          | CADE8 | <i>Carex densa</i>             | 25  | 0.2  | 0.2  | 0.2  |
|          | OESA  | <i>Oenanthe sarmentosa</i>     | 25  | 0.2  | 0.2  | 0.2  |
|          | RUMEX | <i>Rumex</i>                   | 25  | 0.2  | 0.2  | 0.2  |
|          | SPEU  | <i>Sparganium eurycarpum</i>   | 25  | 0.2  | 0.2  | 0.2  |

***Argentina egedii* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 60.7         | 21–85         | –          |
| Herb             | 60.7         | 21–85         | 0.5–2      |
| Shrub            | 0.0          | 0–0           | –          |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), SE (1)

**Macrotopography:** bottom (3)

**Microtopography:** concave (1), undulating (2)

**Parent material:** Franciscan melange (1), sandstone (1), sedimentary (1)

**Soil texture:** loam or sandy loam (1), sand (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (1)

|                   | Mean   | Range     |
|-------------------|--------|-----------|
| Elevation         | 16 ft. | 12–20 ft. |
| Slope             | 0.7°   | 0–2°      |
| Large rock cover  | 0.0%   | 0–0%      |
| Small rock cover  | 0.3%   | 0–1%      |
| Bare ground cover | 1.7%   | 0–5%      |
| Litter cover      | 62.7%  | 0–96%     |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** SONO0104, SONO0453, SONO0751

**SCV Global/State Rank:** G3?/S2?¹

**STAND TABLE**

***Argentina egedii* Association**

n = 3

| Lifeform | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|-------|--------------------------------|-----|------|------|------|
| Herb     | AREG  | <i>Argentina egedii</i>        | 100 | 47.0 | 20.0 | 61.0 |
|          | JULE  | <i>Juncus lesueurii</i>        | 100 | 8.3  | 5.0  | 15.0 |
|          | DISP  | <i>Distichlis spicata</i>      | 67  | 5.1  | 0.2  | 10.0 |
|          | HOLA  | <i>Holcus lanatus</i>          | 33  | 18.0 | 18.0 | 18.0 |
|          | LOCO6 | <i>Lotus corniculatus</i>      | 33  | 6.0  | 6.0  | 6.0  |
|          | DEBE2 | <i>Deschampsia beringensis</i> | 33  | 3.0  | 3.0  | 3.0  |
|          | AGST2 | <i>Agrostis stolonifera</i>    | 33  | 3.0  | 3.0  | 3.0  |
|          | FRSA  | <i>Frankenia salina</i>        | 33  | 2.0  | 2.0  | 2.0  |
|          | JACA4 | <i>Jaumea carnosa</i>          | 33  | 2.0  | 2.0  | 2.0  |
|          | CADE8 | <i>Carex densa</i>             | 33  | 0.2  | 0.2  | 0.2  |
|          | OESA  | <i>Oenanthе sarmentosa</i>     | 33  | 0.2  | 0.2  | 0.2  |
|          | RUMEX | <i>Rumex</i>                   | 33  | 0.2  | 0.2  | 0.2  |
|          | SPEU  | <i>Sparganium eurycarpum</i>   | 33  | 0.2  | 0.2  | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Avena* spp. – *Bromus* spp. Provisional Semi-Natural Alliance**

### **Wild oats – annual brome grasslands**

#### Statewide

*Avena barbata*, *Avena fatua*, *Brachypodium distachyon*, *Bromus diandrus*, and/or *Bromus hordeaceus* dominate or co-dominate in the herbaceous layer. Emergent trees and shrubs may be present at low cover.

Until recently, this type was recognized as two separate alliances. However, the yearly shift of species dominance and the overlap of many non-native *Bromus* and *Avena* species suggests a broader, more inclusive treatment. This alliance is identified by high, persistent cover of non-native grasses, but may have high cover of early spring non-native herbs such as *Erodium* spp. as well.

#### Sonoma County

The *Avena* spp. – *Bromus* spp. Provisional Semi-Natural Alliance ranges widely in Sonoma County, from dry inland locations to mesic coastal grasslands. The variety of semi-natural associations within this alliance ranges from those where *Briza major* is a co-dominant species along the coast to those where *Avena fatua* or *A. barbata* dominates on drier south-facing exposures. *Bromus diandrus* tends to dominate in areas of deeper soil with intermediate moisture conditions.

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#### **Local Alliance Summary (n = 34)**

**Elevation:** 83–1592 ft, mean 642 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

#### **Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

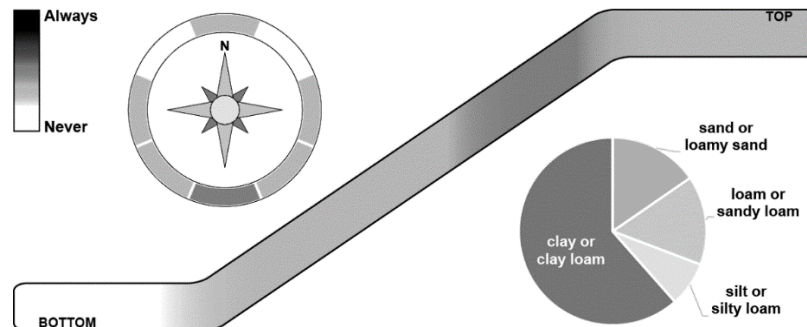
NatureServe global/state rank: G4T2T3/S2S3

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 60.3         | 20–95         | –          |
| Herb                          | 59.5         | 20–95         | <0.5–2     |
| Shrub                         | 0.4          | 0–4           | <0.5–1     |
| Regenerating/understory tree* | 0.0          | 0–1           | 1–2        |
| Hardwood                      | 0.1          | 0–4           | 10–15      |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 12.5° | 1–28° |
| Large rock cover  | 0.8%  | 0–5%  |
| Small rock cover  | 2.2%  | 0–10% |
| Bare ground cover | 17.7% | 0–97% |
| Litter cover      | 68.7% | 0–96% |

**Associations within this Alliance:**

- Avena barbata* Semi-Natural Association
- Brachypodium distachyon* Semi-Natural Association
- Briza maxima* Provisional Semi-Natural Association
- Bromus diandrus* – *Avena* spp. Semi-Natural Association
- Bromus hordeaceus* – *Erodium botrys* Semi-Natural Association

**STAND TABLE**

***Avena* spp. – *Bromus* spp. Provisional Semi-Natural Alliance**

n = 34

| Lifeform | Code  | Botanical Name                  | Con | Avg  | Min | Max  |
|----------|-------|---------------------------------|-----|------|-----|------|
| Herb     | AVBA  | <i>Avena barbata</i>            | 88  | 25.7 | 0.2 | 68.0 |
|          | BRHO2 | <i>Bromus hordeaceus</i>        | 79  | 8.6  | 0.2 | 38.0 |
|          | BRDI3 | <i>Bromus diandrus</i>          | 74  | 11.7 | 0.1 | 70.0 |
|          | HYRA3 | <i>Hypochaeris radicata</i>     | 68  | 3.1  | 0.1 | 25.0 |
|          | VUBR  | <i>Vulpia bromoides</i>         | 65  | 7.5  | 0.2 | 38.0 |
|          | LOPE  | <i>Lolium perenne</i>           | 65  | 5.8  | 0.2 | 38.0 |
|          | ANAR  | <i>Anagallis arvensis</i>       | 62  | 0.6  | 0.2 | 3.0  |
|          | ERBO  | <i>Erodium botrys</i>           | 47  | 6.7  | 0.2 | 38.0 |
|          | VISA  | <i>Vicia sativa</i>             | 47  | 0.3  | 0.2 | 1.0  |
|          | RUAC3 | <i>Rumex acetosella</i>         | 44  | 3.9  | 0.2 | 8.0  |
|          | HYGL2 | <i>Hypochaeris glabra</i>       | 41  | 10.7 | 0.2 | 38.0 |
|          | CYEC  | <i>Cynosurus echinatus</i>      | 41  | 6.2  | 0.2 | 38.0 |
|          | CAPY2 | <i>Carduus pycnocephalus</i>    | 41  | 2.1  | 0.1 | 8.0  |
|          | NAPU4 | <i>Nassella pulchra</i>         | 41  | 2.0  | 0.1 | 8.0  |
|          | SIGA  | <i>Silene gallica</i>           | 38  | 0.8  | 0.2 | 3.0  |
|          | BRDI2 | <i>Brachypodium distachyon</i>  | 35  | 13.6 | 0.2 | 38.0 |
|          | BRMI2 | <i>Briza minor</i>              | 35  | 1.1  | 0.1 | 8.0  |
|          | LOGA2 | <i>Logfia gallica</i>           | 35  | 1.1  | 0.2 | 3.0  |
|          | PLLA  | <i>Plantago lanceolata</i>      | 32  | 6.4  | 0.2 | 38.0 |
|          | LIBI5 | <i>Linum bienne</i>             | 32  | 4.9  | 0.2 | 38.0 |
|          | TRHI4 | <i>Trifolium hirtum</i>         | 32  | 4.3  | 0.1 | 38.0 |
|          | ESCA2 | <i>Eschscholzia californica</i> | 32  | 2.4  | 0.1 | 8.0  |

**STAND TABLE** continued

***Avena* spp. – *Bromus* spp. Provisional Semi-Natural Alliance**

n = 34

| Lifeform | Code   | Botanical Name                                 | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     |        |  |     |      |     |      |
|          | TRSU3  | <i>Trifolium subterraneum</i>                  | 32  | 1.5  | 0.1 | 8.0  |
|          | BRELE  | <i>Brodiaea elegans</i> ssp. <i>elegans</i>    | 32  | 0.5  | 0.2 | 3.0  |
|          | GEDI   | <i>Geranium dissectum</i>                      | 32  | 0.3  | 0.2 | 1.0  |
|          | MEPO3  | <i>Medicago polymorpha</i>                     | 29  | 1.0  | 0.2 | 3.0  |
|          | AICA   | <i>Aira caryophylla</i>                        | 29  | 0.6  | 0.2 | 3.0  |
|          | CRSE11 | <i>Croton setigerus</i>                        | 29  | 0.5  | 0.1 | 3.0  |
|          | BRMA   | <i>Briza maxima</i>                            | 26  | 20.5 | 0.2 | 68.0 |
|          | ERCI6  | <i>Erodium cicutarium</i>                      | 26  | 1.2  | 0.2 | 6.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                        | 26  | 0.8  | 0.2 | 3.0  |
|          | SHAR2  | <i>Sherardia arvensis</i>                      | 26  | 0.2  | 0.1 | 0.2  |
|          | DACA3  | <i>Danthonia californica</i>                   | 24  | 1.6  | 0.2 | 8.0  |
|          | SOAS   | <i>Sonchus asper</i>                           | 24  | 0.6  | 0.2 | 3.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                     | 24  | 0.5  | 0.1 | 3.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i> | 21  | 2.4  | 0.2 | 8.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                | 21  | 1.4  | 0.1 | 3.0  |
|          | RUPU3  | <i>Rumex pulcher</i>                           | 21  | 0.6  | 0.1 | 3.0  |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Avena barbata* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3), Coastal Hills-Santa Rosa Plain/263Aj (9), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.8         | 20–95         | –          |
| <b>Herb</b>                          | 59.6         | 20–95         | <0.5–1     |
| <b>Shrub</b>                         | 0.2          | 0–2           | –          |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–1           | 1–2        |
| <b>Hardwood</b>                      | 0.3          | 0–4           | 10–15      |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), NW (2), SE (5), SW (5), variable (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (4), ridge top (2), upper 1/3 of slope (8), upper 1/3 of slope to ridgetop (1)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data, continued**

**Microtopography:** convex (5), flat (7), undulating (4)

**Parent material:** Franciscan melange (1), metamorphic (1), metasedimentary (7), sandstone (1), sedimentary (2), volcanic (3)

**Soil texture:** clay or clay loam (10), loam or sandy loam (2), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (4), moderate/6-25° (12)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 615 ft. | 83–1395 ft. |
| <b>Slope</b>             | 10.9°   | 1–22°       |
| <b>Large rock cover</b>  | 1.0%    | 0–5%        |
| <b>Small rock cover</b>  | 1.4%    | 0–6%        |
| <b>Bare ground cover</b> | 25.9%   | 1–60%       |
| <b>Litter cover</b>      | 60.9%   | 5–96%       |

**Samples Used to Describe Association (n=16)**

**Rapid Assessments:** SONO0413

**Relevés:** HEAD0051, HEAD0052, HEAD0059, HEAD0152, HEAD0159, HEAD0160, HEAD0256, HEAD0257, HEAD0286, HEAD0348, HEAD0372, HEAD0379, HEAD0383, SONO0471, SONO2209

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Avena barbata* Semi-Natural Association**

n = 16

| Lifeform | Code  | Botanical Name                                 | Con | Avg  | Min | Max  |
|----------|-------|--|-----|------|-----|------|
| Herb     | AVBA  | <i>Avena barbata</i>                           | 100 | 44.6 | 8.0 | 68.0 |
|          | BRHO2 | <i>Bromus hordeaceus</i>                       | 81  | 8.3  | 0.2 | 38.0 |
|          | HYRA3 | <i>Hypochaeris radicata</i>                    | 75  | 2.5  | 0.1 | 8.0  |
|          | LOPE  | <i>Lolium perenne</i>                          | 69  | 6.5  | 0.2 | 38.0 |
|          | VUBR  | <i>Vulpia bromoides</i>                        | 69  | 4.7  | 0.2 | 20.0 |
|          | BRDI3 | <i>Bromus diandrus</i>                         | 69  | 3.7  | 0.2 | 18.0 |
|          | BRELE | <i>Brodiaea elegans</i> ssp. <i>elegans</i>    | 63  | 0.5  | 0.2 | 3.0  |
|          | MEPO3 | <i>Medicago polymorpha</i>                     | 56  | 1.1  | 0.2 | 3.0  |
|          | ANAR  | <i>Anagallis arvensis</i>                      | 56  | 0.2  | 0.2 | 0.2  |
|          | ERBO  | <i>Erodium botrys</i>                          | 50  | 2.8  | 0.2 | 8.0  |
|          | TRHI4 | <i>Trifolium hirtum</i>                        | 44  | 6.2  | 0.1 | 38.0 |
|          | NAPU4 | <i>Nassella pulchra</i>                        | 44  | 2.1  | 0.1 | 8.0  |
|          | LOGA2 | <i>Logfia gallica</i>                          | 44  | 1.8  | 0.2 | 3.0  |
|          | SIGA  | <i>Silene gallica</i>                          | 44  | 1.0  | 0.2 | 3.0  |
|          | VISA  | <i>Vicia sativa</i>                            | 44  | 0.2  | 0.2 | 0.2  |
|          | BRDI2 | <i>Brachypodium distachyon</i>                 | 38  | 15.9 | 0.2 | 38.0 |
|          | CYEC  | <i>Cynosurus echinatus</i>                     | 38  | 9.9  | 0.2 | 38.0 |
|          | HYGL2 | <i>Hypochaeris glabra</i>                      | 38  | 7.4  | 0.2 | 38.0 |
|          | RUAC3 | <i>Rumex acetosella</i>                        | 38  | 3.4  | 0.2 | 8.0  |
|          | HOMAG | <i>Hordeum marinum</i> ssp. <i>gussonianum</i> | 38  | 2.8  | 0.2 | 8.0  |
|          | TRSU3 | <i>Trifolium subterraneum</i>                  | 38  | 2.4  | 0.2 | 8.0  |
|          | BRMI2 | <i>Briza minor</i>                             | 38  | 2.0  | 0.2 | 8.0  |
|          | ERCI6 | <i>Erodium cicutarium</i>                      | 38  | 1.8  | 0.2 | 6.0  |
|          | ESCA2 | <i>Eschscholzia californica</i>                | 38  | 1.6  | 0.2 | 3.0  |
|          | CAPY2 | <i>Carduus pycnocephalus</i>                   | 38  | 1.1  | 0.2 | 3.0  |

**STAND TABLE** continued

***Avena barbata* Semi-Natural Association**

n = 16

| Lifeform | Code   | Botanical Name                               | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | HOMUL  | <i>Hordeum murinum</i> ssp. <i>leporinum</i> | 38  | 1.1  | 0.2 | 3.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                      | 38  | 1.1  | 0.2 | 3.0  |
|          | SHAR2  | <i>Sherardia arvensis</i>                    | 38  | 0.2  | 0.1 | 0.2  |
|          | BETR   | <i>Bellardia trixago</i>                     | 31  | 3.3  | 0.2 | 8.0  |
|          | LIBI5  | <i>Linum bienne</i>                          | 31  | 2.3  | 0.2 | 8.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>              | 31  | 1.3  | 0.1 | 3.0  |
|          | CRSE11 | <i>Croton setigerus</i>                      | 31  | 0.2  | 0.2 | 0.2  |
|          | PLLA   | <i>Plantago lanceolata</i>                   | 25  | 10.4 | 0.2 | 38.0 |
|          | CESO3  | <i>Centaurea solstitialis</i>                | 25  | 6.1  | 0.2 | 8.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                   | 25  | 0.9  | 0.2 | 3.0  |
|          | LETA   | <i>Leontodon taraxacoides</i>                | 25  | 0.2  | 0.2 | 0.2  |
|          | RUPU3  | <i>Rumex pulcher</i>                         | 25  | 0.2  | 0.2 | 0.2  |
|          | GEDI   | <i>Geranium dissectum</i>                    | 25  | 0.2  | 0.2 | 0.2  |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Brachypodium distachyon* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 45–85         | –          |
| <b>Herb</b>                          | 59.3         | 45–85         | 0.5–1      |
| <b>Shrub</b>                         | 0.7          | 0–2           | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (2)

**Macrotopography:** lower 1/3 of slope (1), upper 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (2), flat (1)

**Parent material:** Franciscan melange (1), metasedimentary (1), sedimentary (1)

**Soil texture:** sand (1)

**Slope steepness:** moderate/6–25° (3)

|                  | Mean    | Range       |
|------------------|---------|-------------|
| <b>Elevation</b> | 286 ft. | 124–445 ft. |
| <b>Slope</b>     | 22.3°   | 20–25°      |



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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Large rock cover  | 1.7%  | 0–5%   |
| Small rock cover  | 1.7%  | 1–3%   |
| Bare ground cover | 7.7%  | 3–17%  |
| Litter cover      | 83.3% | 70–94% |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** HEAD0056, HEAD0118, SONO0883

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Brachypodium distachyon* Semi-Natural Association**

n = 3

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | TODI   | <i>Toxicodendron diversilobum</i>                | 67  | 1.6  | 0.2  | 3.0  |
|          | BAPI   | <i>Baccharis pilularis</i>                       | 33  | 0.2  | 0.2  | 0.2  |
| Herb     | BRDI2  | <i>Brachypodium distachyon</i>                   | 100 | 21.3 | 8.0  | 38.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                       | 100 | 9.4  | 0.2  | 18.0 |
|          | CYEC   | <i>Cynosurus echinatus</i>                       | 100 | 6.4  | 0.2  | 18.0 |
|          | AVBA   | <i>Avena barbata</i>                             | 100 | 2.7  | 2.0  | 3.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                      | 100 | 1.4  | 0.2  | 3.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 100 | 1.1  | 0.2  | 3.0  |
|          | DACA3  | <i>Danthonia californica</i>                     | 100 | 0.5  | 0.2  | 1.0  |
|          | LIBI5  | <i>Linum bienne</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|          | LOPE   | <i>Lolium perenne</i>                            | 67  | 19.5 | 1.0  | 38.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 67  | 19.1 | 0.2  | 38.0 |
|          | DIDO3  | <i>Dichondra donelliana</i>                      | 67  | 19.1 | 0.2  | 38.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 67  | 4.5  | 1.0  | 8.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                        | 67  | 4.1  | 0.2  | 8.0  |
|          | NAPU4  | <i>Nassella pulchra</i>                          | 67  | 4.1  | 0.2  | 8.0  |
|          | RUAC3  | <i>Rumex acetosella</i>                          | 67  | 4.1  | 0.2  | 8.0  |
|          | TRMA2  | <i>Trifolium macraei</i>                         | 67  | 1.6  | 0.2  | 3.0  |
|          | SIGA   | <i>Silene gallica</i>                            | 67  | 1.6  | 0.2  | 3.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                     | 67  | 1.6  | 0.1  | 3.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                    | 67  | 0.2  | 0.2  | 0.2  |
|          | DAPU3  | <i>Daucus pusillus</i>                           | 67  | 0.2  | 0.2  | 0.2  |
|          | ERBO   | <i>Erodium botrys</i>                            | 67  | 0.2  | 0.2  | 0.2  |
|          | ERCI6  | <i>Erodium cicutarium</i>                        | 67  | 0.2  | 0.2  | 0.2  |
|          | GEDI   | <i>Geranium dissectum</i>                        | 67  | 0.2  | 0.2  | 0.2  |
|          | KOMA   | <i>Koeleria macrantha</i>                        | 67  | 0.2  | 0.2  | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>                             | 67  | 0.2  | 0.2  | 0.2  |
|          | TRLA16 | <i>Triteleia laxa</i>                            | 67  | 0.2  | 0.2  | 0.2  |
|          | CENTA  | <i>Centaurea</i>                                 | 67  | 0.2  | 0.2  | 0.2  |
|          | LUPIN  | <i>Lupinus</i>                                   | 67  | 0.2  | 0.2  | 0.2  |
|          | NAMA7  | <i>Nassella manicata</i>                         | 33  | 17.0 | 17.0 | 17.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                         | 33  | 3.0  | 3.0  | 3.0  |
|          | CAPUS  | <i>Calystegia purpurata</i> ssp. <i>saxicola</i> | 33  | 3.0  | 3.0  | 3.0  |
|          | ERIOG  | <i>Eriogonum</i>                                 | 33  | 3.0  | 3.0  | 3.0  |

**STAND TABLE** continued

***Brachypodium distachyon* Semi-Natural Association**

n = 3

| Lifeform<br>Herb | Code   | Botanical Name                                    | Con | Avg | Min | Max |
|------------------|--------|---|-----|-----|-----|-----|
|                  | TRIFO  | <i>Trifolium</i>                                  | 33  | 3.0 | 3.0 | 3.0 |
|                  | HOLA   | <i>Holcus lanatus</i>                             | 33  | 2.0 | 2.0 | 2.0 |
|                  | SOOL   | <i>Sonchus oleraceus</i>                          | 33  | 0.2 | 0.2 | 0.2 |
|                  | SIBE   | <i>Sisyrinchium bellum</i>                        | 33  | 0.2 | 0.2 | 0.2 |
|                  | VISA   | <i>Vicia sativa</i>                               | 33  | 0.2 | 0.2 | 0.2 |
|                  | TRGL4  | <i>Trifolium glomeratum</i>                       | 33  | 0.2 | 0.2 | 0.2 |
|                  | TRDU2  | <i>Trifolium dubium</i>                           | 33  | 0.2 | 0.2 | 0.2 |
|                  | STRIR3 | <i>Stachys rigida</i> var. <i>rigida</i>          | 33  | 0.2 | 0.2 | 0.2 |
|                  | BRCA5  | <i>Bromus carinatus</i>                           | 33  | 0.2 | 0.2 | 0.2 |
|                  | ACPIC2 | <i>Acaena pinnatifida</i> var. <i>californica</i> | 33  | 0.2 | 0.2 | 0.2 |
|                  | ACMI2  | <i>Achillea millefolium</i>                       | 33  | 0.2 | 0.2 | 0.2 |
|                  | AICA   | <i>Aira caryophyllea</i>                          | 33  | 0.2 | 0.2 | 0.2 |
|                  | STAJ   | <i>Stachys ajugoides</i>                          | 33  | 0.2 | 0.2 | 0.2 |
|                  | BRMI2  | <i>Briza minor</i>                                | 33  | 0.2 | 0.2 | 0.2 |
|                  | CALYS  | <i>Calystegia</i>                                 | 33  | 0.2 | 0.2 | 0.2 |
|                  | CAREX  | <i>Carex</i>                                      | 33  | 0.2 | 0.2 | 0.2 |
|                  | CIVU   | <i>Cirsium vulgare</i>                            | 33  | 0.2 | 0.2 | 0.2 |
|                  | ELGL   | <i>Elymus glaucus</i>                             | 33  | 0.2 | 0.2 | 0.2 |
|                  | ESCA2  | <i>Eschscholzia californica</i>                   | 33  | 0.2 | 0.2 | 0.2 |
|                  | HECR2  | <i>Hedypnois cretica</i>                          | 33  | 0.2 | 0.2 | 0.2 |
|                  | LITR4  | <i>Linum trigynum</i>                             | 33  | 0.2 | 0.2 | 0.2 |
|                  | LOGA2  | <i>Logfia gallica</i>                             | 33  | 0.2 | 0.2 | 0.2 |
|                  | LOWR2  | <i>Lotus wrangelianus</i>                         | 33  | 0.2 | 0.2 | 0.2 |
|                  | PLER3  | <i>Plantago erecta</i>                            | 33  | 0.2 | 0.2 | 0.2 |
|                  | RORO   | <i>Romulea rosea</i>                              | 33  | 0.2 | 0.2 | 0.2 |
|                  | 2DAPI  | <i>Danthonia pilosa</i>                           | 33  | 0.2 | 0.2 | 0.2 |
|                  | SAAR9  | <i>Sanicula arctopoides</i>                       | 33  | 0.2 | 0.2 | 0.2 |
|                  | SHAR2  | <i>Sherardia arvensis</i>                         | 33  | 0.2 | 0.2 | 0.2 |
|                  | BRMA   | <i>Briza maxima</i>                               | 33  | 0.2 | 0.2 | 0.2 |
|                  | JUPA2  | <i>Juncus patens</i>                              | 33  | 0.2 | 0.2 | 0.2 |
|                  | ORFA   | <i>Orobanche fasciculata</i>                      | 33  | 0.1 | 0.1 | 0.1 |
|                  | PHACE  | <i>Phacelia</i>                                   | 33  | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Briza maxima* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) and Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsections (Miles and Goudey 1997).

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 45–85         | –          |
| <b>Herb</b>                          | 60.0         | 45–85         | –          |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (4)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (3)

**Microtopography:** concave (1), convex (3), flat (1)

**Parent material:** igneous (1), metasedimentary (3), sedimentary (1)

**Soil texture:** clay or clay loam (2), loam or sandy loam (1), sand (2)

**Slope steepness:** moderate/6-25° (4), steep/>25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 533 ft. | 106–1100 ft. |
| <b>Slope</b>             | 16.8°   | 6–28°        |
| <b>Large rock cover</b>  | 0.2%    | 0–1%         |
| <b>Small rock cover</b>  | 5.8%    | 1–10%        |
| <b>Bare ground cover</b> | 7.4%    | 2–15%        |
| <b>Litter cover</b>      | 79.2%   | 65–91%       |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** none

**Relevés:** HEAD0105, HEAD0111, HEAD0207, HEAD0218, HEAD0298

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Briza maxima* Provisional Semi-Natural Association**

n = 5

| Lifeform     | Code   | Botanical Name                               | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> | VIAMA3 | <i>Vicia americana</i> ssp. <i>americana</i> | 20  | 0.2  | 0.2  | 0.2  |
|              | LUAR   | <i>Lupinus arboreus</i>                      | 20  | 0.1  | 0.1  | 0.1  |
|              | BAPI   | <i>Baccharis pilularis</i>                   | 20  | 0.1  | 0.1  | 0.1  |
| <b>Herb</b>  | BRMA   | <i>Briza maxima</i>                          | 100 | 36.0 | 18.0 | 68.0 |
|              | BRDI3  | <i>Bromus diandrus</i>                       | 100 | 8.9  | 0.1  | 18.0 |
|              | VUBR   | <i>Vulpia bromoides</i>                      | 100 | 3.9  | 0.2  | 8.0  |
|              | RUAC3  | <i>Rumex acetosella</i>                      | 80  | 4.8  | 0.2  | 8.0  |
|              | HYRA3  | <i>Hypochaeris radicata</i>                  | 80  | 2.9  | 0.2  | 8.0  |
|              | AVBA   | <i>Avena barbata</i>                         | 80  | 1.6  | 0.2  | 3.0  |
|              | AICA   | <i>Aira caryophylla</i>                      | 80  | 0.2  | 0.2  | 0.2  |
|              | HYGL2  | <i>Hypochaeris glabra</i>                    | 60  | 25.4 | 0.2  | 38.0 |
|              | BRHO2  | <i>Bromus hordeaceus</i>                     | 60  | 3.0  | 3.0  | 3.0  |
|              | CAPY2  | <i>Carduus pycnocephalus</i>                 | 60  | 2.8  | 0.2  | 8.0  |
|              | LOPE   | <i>Lolium perenne</i>                        | 60  | 1.1  | 0.2  | 3.0  |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Briza maxima* Provisional Semi-Natural Association**

n = 5

| Lifeform<br>Herb | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|------------------|--------|--|-----|------|------|------|
|                  | BRODI  | <i>Brodiaea</i>                                  | 60  | 1.1  | 0.2  | 3.0  |
|                  | ANAR   | <i>Anagallis arvensis</i>                        | 60  | 0.2  | 0.2  | 0.2  |
|                  | LOHU2  | <i>Lotus humistratus</i>                         | 60  | 0.2  | 0.2  | 0.2  |
|                  | VUMY   | <i>Vulpia myuros</i>                             | 40  | 18.0 | 18.0 | 18.0 |
|                  | ERBO   | <i>Erodium botrys</i>                            | 40  | 8.0  | 8.0  | 8.0  |
|                  | ESCA2  | <i>Eschscholzia californica</i>                  | 40  | 8.0  | 8.0  | 8.0  |
|                  | LOMI   | <i>Lotus micranthus</i>                          | 40  | 8.0  | 8.0  | 8.0  |
|                  | LUNA3  | <i>Lupinus nanus</i>                             | 40  | 3.0  | 3.0  | 3.0  |
|                  | HOLA   | <i>Holcus lanatus</i>                            | 40  | 1.6  | 0.2  | 3.0  |
|                  | SOAS   | <i>Sonchus asper</i>                             | 40  | 1.6  | 0.2  | 3.0  |
|                  | VISA   | <i>Vicia sativa</i>                              | 40  | 0.2  | 0.2  | 0.2  |
|                  | DACA3  | <i>Danthonia californica</i>                     | 40  | 0.2  | 0.2  | 0.2  |
|                  | DIDO3  | <i>Dichondra donelliana</i>                      | 40  | 0.2  | 0.2  | 0.2  |
|                  | GAAP2  | <i>Galium aparine</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|                  | GEDI   | <i>Geranium dissectum</i>                        | 40  | 0.2  | 0.2  | 0.2  |
|                  | LOGA2  | <i>Logfia gallica</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|                  | SIGA   | <i>Silene gallica</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|                  | PLLA   | <i>Plantago lanceolata</i>                       | 40  | 0.2  | 0.2  | 0.2  |
|                  | CRSE11 | <i>Croton setigerus</i>                          | 40  | 0.2  | 0.1  | 0.2  |
|                  | ELGL   | <i>Elymus glaucus</i>                            | 20  | 8.0  | 8.0  | 8.0  |
|                  | HEMA80 | <i>Heracleum maximum</i>                         | 20  | 8.0  | 8.0  | 8.0  |
|                  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 20  | 8.0  | 8.0  | 8.0  |
|                  | BRCA5  | <i>Bromus carinatus</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|                  | ERIOG  | <i>Eriogonum</i>                                 | 20  | 3.0  | 3.0  | 3.0  |
|                  | CIVU   | <i>Cirsium vulgare</i>                           | 20  | 3.0  | 3.0  | 3.0  |
|                  | CIQU2  | <i>Cirsium quercetorum</i>                       | 20  | 3.0  | 3.0  | 3.0  |
|                  | CHPO3  | <i>Chlorogalum pomeridianum</i>                  | 20  | 3.0  | 3.0  | 3.0  |
|                  | BRMA5  | <i>Bromus maritimus</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|                  | RASA2  | <i>Raphanus sativus</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|                  | BROMU  | <i>Bromus</i>                                    | 20  | 3.0  | 3.0  | 3.0  |
|                  | BRDI2  | <i>Brachypodium distachyon</i>                   | 20  | 3.0  | 3.0  | 3.0  |
|                  | CAPUS  | <i>Calystegia purpurata</i> ssp. <i>saxicola</i> | 20  | 3.0  | 3.0  | 3.0  |
|                  | MECA2  | <i>Melica californica</i>                        | 20  | 0.2  | 0.2  | 0.2  |
|                  | ELYMU  | <i>Elymus</i>                                    | 20  | 0.2  | 0.2  | 0.2  |
|                  | AMSIN  | <i>Amsinckia</i>                                 | 20  | 0.2  | 0.2  | 0.2  |
|                  | AMLY   | <i>Amsinckia lycopsoides</i>                     | 20  | 0.2  | 0.2  | 0.2  |
|                  | BRNI   | <i>Brassica nigra</i>                            | 20  | 0.2  | 0.2  | 0.2  |
|                  | BRMI2  | <i>Briza minor</i>                               | 20  | 0.2  | 0.2  | 0.2  |
|                  | NAPU4  | <i>Nassella pulchra</i>                          | 20  | 0.2  | 0.2  | 0.2  |
|                  | CYEC   | <i>Cynosurus echinatus</i>                       | 20  | 0.2  | 0.2  | 0.2  |
|                  | LIBI5  | <i>Linum bienne</i>                              | 20  | 0.2  | 0.2  | 0.2  |
|                  | LUCO6  | <i>Luzula comosa</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|                  | MOVI2  | <i>Monardella villosa</i>                        | 20  | 0.2  | 0.2  | 0.2  |
|                  | OXALI  | <i>Oxalis</i>                                    | 20  | 0.2  | 0.2  | 0.2  |
|                  | TOAR   | <i>Torilis arvensis</i>                          | 20  | 0.2  | 0.2  | 0.2  |
|                  | TRWI3  | <i>Trifolium willdenovii</i>                     | 20  | 0.2  | 0.2  | 0.2  |
|                  | CEGL2  | <i>Cerastium glomeratum</i>                      | 20  | 0.2  | 0.2  | 0.2  |

**STAND TABLE** continued

***Briza maxima* Provisional Semi-Natural Association**

n = 5

| Lifeform | Code   | Botanical Name                                       | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Herb     | SOOL   | <i>Sonchus oleraceus</i>                             | 20  | 0.1 | 0.1 | 0.1 |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 20  | 0.1 | 0.1 | 0.1 |
|          | TRMI4  | <i>Trifolium microcephalum</i>                       | 20  | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Bromus diandrus* – *Avena* spp. Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (2) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 77.0         | 70–85         | –          |
| <b>Herb</b>                          | 71.0         | 45–85         | 1–2        |
| <b>Shrub</b>                         | 1.5          | 0–4           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (4)

**Macrotopography:** ridge top (2), upper 1/3 of slope (2)

**Microtopography:** concave (1), convex (1), flat (2)

**Parent material:** igneous (1), metasedimentary (1), volcanic (2)

**Soil texture:** clay or clay loam (2), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 654 ft. | 199–1533 ft. |
| <b>Slope</b>             | 11.0°   | 5–18°        |
| <b>Large rock cover</b>  | 0.3%    | 0–1%         |
| <b>Small rock cover</b>  | 0.5%    | 0–1%         |
| <b>Bare ground cover</b> | 2.3%    | 1–5%         |
| <b>Litter cover</b>      | 91.0%   | 85–95%       |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** none

**Relevés:** HEAD0011, HEAD0020, HEAD0365, SONO0743

**SCV Global/State Rank:** Not ranked – semi-natural association.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Bromus diandrus* – *Avena* spp. Semi-Natural Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Shrub</b>    | TODI        | <i>Toxicodendron diversilobum</i>                  | 25         | 8.0        | 8.0        | 8.0        |
| <b>Herb</b>     | BRDI3       | <i>Bromus diandrus</i>                             | 100        | 41.0       | 18.0       | 70.0       |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                           | 100        | 6.1        | 0.2        | 18.0       |
|                 | VISA        | <i>Vicia sativa</i>                                | 100        | 0.3        | 0.2        | 0.4        |
|                 | AVBA        | <i>Avena barbata</i>                               | 75         | 7.1        | 0.2        | 18.0       |
|                 | CAPY2       | <i>Carduus pycnocephalus</i>                       | 75         | 3.7        | 0.2        | 8.0        |
|                 | LOPE        | <i>Lolium perenne</i>                              | 75         | 3.7        | 0.2        | 8.0        |
|                 | VUBR        | <i>Vulpia bromoides</i>                            | 50         | 38.0       | 38.0       | 38.0       |
|                 | RUAC3       | <i>Rumex acetosella</i>                            | 50         | 5.5        | 3.0        | 8.0        |
|                 | ACMI2       | <i>Achillea millefolium</i>                        | 50         | 1.6        | 0.2        | 3.0        |
|                 | BRCA5       | <i>Bromus carinatus</i>                            | 50         | 1.6        | 0.2        | 3.0        |
|                 | HOBR2       | <i>Hordeum brachyantherum</i>                      | 50         | 1.6        | 0.2        | 3.0        |
|                 | TRHI4       | <i>Trifolium hirtum</i>                            | 50         | 1.6        | 0.2        | 3.0        |
|                 | HYRA3       | <i>Hypochaeris radicata</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                 | ANAR        | <i>Anagallis arvensis</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                 | CEAR4       | <i>Cerastium arvense</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                 | GEDI        | <i>Geranium dissectum</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                 | SIMA3       | <i>Silybum marianum</i>                            | 50         | 0.2        | 0.1        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>                             | 50         | 0.1        | 0.1        | 0.1        |
|                 | CAPUS       | <i>Calystegia purpurata</i> ssp. <i>saxicola</i>   | 25         | 8.0        | 8.0        | 8.0        |
|                 | LUF0F       | <i>Lupinus formosus</i> var. <i>formosus</i>       | 25         | 7.0        | 7.0        | 7.0        |
|                 | CATU3       | <i>Carex tumulicola</i>                            | 25         | 3.0        | 3.0        | 3.0        |
|                 | CIQU2       | <i>Cirsium quercetorum</i>                         | 25         | 3.0        | 3.0        | 3.0        |
|                 | HOMU        | <i>Hordeum murinum</i>                             | 25         | 3.0        | 3.0        | 3.0        |
|                 | LUVE        | <i>Lupinus versicolor</i>                          | 25         | 3.0        | 3.0        | 3.0        |
|                 | NAPU4       | <i>Nassella pulchra</i>                            | 25         | 3.0        | 3.0        | 3.0        |
|                 | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i>   | 25         | 3.0        | 3.0        | 3.0        |
|                 | RUPU3       | <i>Rumex pulcher</i>                               | 25         | 3.0        | 3.0        | 3.0        |
|                 | SIMA2       | <i>Sidalcea malviflora</i>                         | 25         | 3.0        | 3.0        | 3.0        |
|                 | CESO3       | <i>Centaurea solstitialis</i>                      | 25         | 2.0        | 2.0        | 2.0        |
|                 | MASA        | <i>Madia sativa</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | TRSU3       | <i>Trifolium subterraneum</i>                      | 25         | 0.2        | 0.2        | 0.2        |
|                 | GEMO        | <i>Geranium molle</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | VIHI        | <i>Vicia hirsuta</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|                 | TRDU2       | <i>Trifolium dubium</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | TOAR        | <i>Torilis arvensis</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | STAJ        | <i>Stachys ajugoides</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                 | SOAS        | <i>Sonchus asper</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|                 | SIOF        | <i>Sisymbrium officinale</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | AICA        | <i>Aira caryophylla</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | PLLA        | <i>Plantago lanceolata</i>                         | 25         | 0.2        | 0.2        | 0.2        |
|                 | SIGA        | <i>Silene gallica</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | LASE        | <i>Lactuca serriola</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | AMSIN       | <i>Amsinckia</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                 | CLPEP       | <i>Claytonia perfoliata</i> ssp. <i>perfoliata</i> | 25         | 0.2        | 0.2        | 0.2        |
|                 | CRSE11      | <i>Croton setigerus</i>                            | 25         | 0.2        | 0.2        | 0.2        |

**STAND TABLE** continued

***Bromus diandrus* – *Avena* spp. Semi-Natural Association**

n = 4

| Lifeform | Code   | Botanical Name                                       | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Herb     | CYEC   | <i>Cynosurus echinatus</i>                           | 25  | 0.2 | 0.2 | 0.2 |
|          | ERGL11 | <i>Erechtites glomeratus</i>                         | 25  | 0.2 | 0.2 | 0.2 |
|          | ERCI6  | <i>Erodium cicutarium</i>                            | 25  | 0.2 | 0.2 | 0.2 |
|          | GAAP2  | <i>Galium aparine</i>                                | 25  | 0.2 | 0.2 | 0.2 |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 25  | 0.2 | 0.2 | 0.2 |
|          | WYAN   | <i>Wyethia angustifolia</i>                          | 25  | 0.2 | 0.2 | 0.2 |
|          | LOTUS  | <i>Lotus</i>   | 25  | 0.2 | 0.2 | 0.2 |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 25  | 0.1 | 0.1 | 0.1 |
|          | HOLA   | <i>Holcus lanatus</i>                                | 25  | 0.1 | 0.1 | 0.1 |
|          | SACR2  | <i>Sanicula crassicaulis</i>                         | 25  | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Bromus hordeaceus* – *Erodium botrys* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (2), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 54.0         | 20–70         | –          |
| <b>Herb</b>                          | 54.0         | 20–70         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.1          | 0–0.2         | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (1), SW (3)

**Macrotopography:** middle 1/3 of slope (1), middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (2)

**Microtopography:** convex (2), flat (1), undulating (2)

**Parent material:** Franciscan melange (1), metamorphic (1), metasedimentary (2), volcanic (1)

**Soil texture:** clay or clay loam (1), loam or sandy loam (1), sand (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (4)

|                         | Mean    | Range        |
|-------------------------|---------|--------------|
| <b>Elevation</b>        | 947 ft. | 399–1592 ft. |
| <b>Slope</b>            | 10.2°   | 3–18°        |
| <b>Large rock cover</b> | 0.1%    | 0–0.2%       |

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|                   | Mean  | Range |
|-------------------|-------|-------|
| Small rock cover  | 0.8%  | 0–2%  |
| Bare ground cover | 22.4% | 0–97% |
| Litter cover      | 54.6% | 0–95% |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** none

**Relevés:** HEAD0094, HEAD0378, MILOB123, SONO0744, SONO0935

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Bromus hordeaceus* – *Erodium botrys* Semi-Natural Association**

n = 5

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    |        |  |     |      |      |      |
|          | A DFA  | <i>Adenostoma fasciculatum</i>                       | 20  | 0.2  | 0.2  | 0.2  |
| Herb     |        |  |     |      |      |      |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 100 | 16.2 | 3.0  | 30.0 |
|          | ERBO   | <i>Erodium botrys</i>                                | 80  | 17.1 | 0.2  | 38.0 |
|          | AVBA   | <i>Avena barbata</i>                                 | 80  | 5.4  | 0.2  | 18.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                            | 80  | 1.4  | 0.2  | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                                   | 80  | 0.4  | 0.1  | 1.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                            | 60  | 7.1  | 0.2  | 18.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 60  | 0.8  | 0.2  | 2.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 60  | 0.2  | 0.1  | 0.2  |
|          | LIBI5  | <i>Linum bienne</i>                                  | 40  | 20.5 | 3.0  | 38.0 |
|          | HYRA3  | <i>Hypochaeris radicata</i>                          | 40  | 12.6 | 0.2  | 25.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                              | 40  | 4.1  | 0.2  | 8.0  |
|          | CYEC   | <i>Cynosurus echinatus</i>                           | 40  | 3.6  | 0.2  | 7.0  |
|          | BRMA   | <i>Briza maxima</i>                                  | 40  | 2.1  | 0.2  | 4.0  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 40  | 1.6  | 0.2  | 3.0  |
|          | CRSE11 | <i>Croton setigerus</i>                              | 40  | 1.6  | 0.1  | 3.0  |
|          | LOPE   | <i>Lolium perenne</i>                                | 40  | 1.0  | 1.0  | 1.0  |
|          | AICA   | <i>Aira caryophyllea</i>                             | 40  | 0.6  | 0.2  | 1.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                        | 40  | 0.6  | 0.1  | 1.0  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 40  | 0.2  | 0.2  | 0.2  |
|          | LOGA2  | <i>Logfia gallica</i>                                | 40  | 0.2  | 0.2  | 0.2  |
|          | LUNA3  | <i>Lupinus nanus</i>                                 | 40  | 0.2  | 0.2  | 0.2  |
|          | SHAR2  | <i>Sherardia arvensis</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|          | VUMY   | <i>Vulpia myuros</i>                                 | 40  | 0.2  | 0.2  | 0.2  |
|          | BRDI2  | <i>Brachypodium distachyon</i>                       | 40  | 0.2  | 0.2  | 0.2  |
|          | RUPU3  | <i>Rumex pulcher</i>                                 | 40  | 0.2  | 0.1  | 0.2  |
|          | BRDI3  | <i>Bromus diandrus</i>                               | 40  | 0.2  | 0.1  | 0.2  |
|          | TRHI4  | <i>Trifolium hirtum</i>                              | 40  | 0.2  | 0.1  | 0.2  |
|          | LETA   | <i>Leontodon taraxacoides</i>                        | 20  | 15.0 | 15.0 | 15.0 |
|          | TRMI4  | <i>Trifolium microcephalum</i>                       | 20  | 8.0  | 8.0  | 8.0  |
|          | PEAU3  | <i>Pentachaeta aurea</i>                             | 20  | 8.0  | 8.0  | 8.0  |
|          | NALE2  | <i>Nassella lepida</i>                               | 20  | 5.0  | 5.0  | 5.0  |
|          | DACA3  | <i>Danthonia californica</i>                         | 20  | 3.0  | 3.0  | 3.0  |
|          | TRGR2  | <i>Trifolium gracilentum</i>                         | 20  | 3.0  | 3.0  | 3.0  |
|          | PEDU2  | <i>Petrorhagia dubia</i>                             | 20  | 3.0  | 3.0  | 3.0  |



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**STAND TABLE** continued

***Bromus hordeaceus* – *Erodium botrys* Semi-Natural Association**

n = 5

| Lifeform<br>Herb | Code   | Botanical Name  | Con | Avg | Min | Max |
|------------------|--------|---|-----|-----|-----|-----|
|                  | CLINT  | <i>Clintonia</i>  | 20  | 2.0 | 2.0 | 2.0 |
|                  | GEDI   | <i>Geranium dissectum</i>                               | 20  | 1.0 | 1.0 | 1.0 |
|                  | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>     | 20  | 1.0 | 1.0 | 1.0 |
|                  | VISA   | <i>Vicia sativa</i>                                     | 20  | 1.0 | 1.0 | 1.0 |
|                  | CHPO3  | * <i>Chlorogalum pomeridianum</i>                       | 20  | 0.2 | 0.2 | 0.2 |
|                  | CIRSI  | <i>Cirsium</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | CLARK  | <i>Clarkia</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | ELYMU  | <i>Elymus</i>   | 20  | 0.2 | 0.2 | 0.2 |
|                  | GALIU  | <i>Galium</i>   | 20  | 0.2 | 0.2 | 0.2 |
|                  | GAPH2  | <i>Gastroidium phleoides</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|                  | GERAN  | <i>Geranium</i>   | 20  | 0.2 | 0.2 | 0.2 |
|                  | CEGL2  | <i>Cerastium glomeratum</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>          | 20  | 0.2 | 0.2 | 0.2 |
|                  | HECO7  | <i>Hemizonia congesta</i>                               | 20  | 0.2 | 0.2 | 0.2 |
|                  | CESO3  | <i>Centaurea solstitialis</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRMI5  | <i>Trifolium microdon</i>                               | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRWI3  | <i>Trifolium willdenovii</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRVEF  | <i>Triphysaria versicolor</i> ssp. <i>faucibarbatas</i> | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRHY3  | <i>Triteleia hyacinthina</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|                  | CAAMI2 | <i>Castilleja ambigua</i> ssp. <i>insalutata</i>        | 20  | 0.2 | 0.2 | 0.2 |
|                  | TORIL  | <i>Torilis</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | ANOD   | <i>Anthoxanthum odoratum</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|                  | JUBU   | <i>Juncus bufonius</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|                  | BRELE  | <i>Brodiaea elegans</i> ssp. <i>elegans</i>             | 20  | 0.2 | 0.2 | 0.2 |
|                  | BRCA5  | <i>Bromus carinatus</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | CAOV4  | <i>Camissonia ovata</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | CAAT25 | <i>Castilleja attenuata</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRIFO  | <i>Trifolium</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | SOAS   | <i>Sonchus asper</i>                                    | 20  | 0.2 | 0.2 | 0.2 |
|                  | HORDE  | <i>Hordeum</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | TACA8  | <i>Taeniatherum caput-medusae</i>                       | 20  | 0.2 | 0.2 | 0.2 |
|                  | LASA   | <i>Lactuca saligna</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|                  | SOSE2  | <i>Soliva sessilis</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|                  | SIGA   | <i>Silene gallica</i>                                   | 20  | 0.2 | 0.2 | 0.2 |
|                  | SCPE   | <i>Scandix pecten-veneris</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|                  | SABI3  | <i>Sanicula bipinnatifida</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRDU2  | <i>Trifolium dubium</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRDE   | <i>Trifolium depauperatum</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRCI   | <i>Trifolium ciliolatum</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRAL5  | <i>Trifolium albopurpureum</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|                  | PAVI3  | <i>Parentucellia viscosa</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|                  | LASE   | <i>Lactuca serriola</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | LOTUS  | <i>Lotus</i>  | 20  | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Bromus hordeaceus* – *Erodium botrys* Semi-Natural Association**

n = 5

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                      | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         | LOMI        | <i>Lotus micranthus</i>                                    | 20         | 0.2        | 0.2        | 0.2        |
|                     | LOUNU       | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i>       | 20         | 0.2        | 0.2        | 0.2        |
|                     | TRBI        | <i>Trifolium bifidum</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                     | MEPO3       | <i>Medicago polymorpha</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                     | PLLA        | <i>Plantago lanceolata</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                     | RACA2       | <i>Ranunculus californicus</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                     | RAMU2       | <i>Ranunculus muricatus</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                     | RUMEX       | <i>Rumex</i>   | 20         | 0.2        | 0.2        | 0.2        |
|                     | RUAC3       | <i>Rumex acetosella</i>                                    | 20         | 0.2        | 0.2        | 0.2        |
|                     | LUBI        | <i>Lupinus bicolor</i>                                     | 20         | 0.2        | 0.2        | 0.2        |
|                     | ASGA        | <i>Astragalus gambelanus</i>                               | 20         | 0.1        | 0.1        | 0.1        |
|                     | TRCA5       | <i>Trifolium campestre</i>                                 | 20         | 0.1        | 0.1        | 0.1        |
|                     | TRPU16      | <i>Triphysaria pusilla</i>                                 | 20         | 0.1        | 0.1        | 0.1        |
|                     | DAPU3       | <i>Daucus pusillus</i>                                     | 20         | 0.1        | 0.1        | 0.1        |
|                     | CLPUQ       | <i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>          | 20         | 0.1        | 0.1        | 0.1        |
|                     | CHPOP4      | * <i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i> | 20         | 0.1        | 0.1        | 0.1        |
|                     | PLNO        | <i>Plagiobothrys nothofulvus</i>                           | 20         | 0.1        | 0.1        | 0.1        |
|                     | MAAN2       | <i>Madia anomala</i>                                       | 20         | 0.1        | 0.1        | 0.1        |
|                     | ESCA2       | <i>Eschscholzia californica</i>                            | 20         | 0.1        | 0.1        | 0.1        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2LICHN      | Lichen   | 20         | 0.2        | 0.2        | 0.2        |
|                     | 2MOSS       | Moss   | 20         | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Azolla (filiculoides, mexicana)* Provisional Alliance**  
**Mosquito fern mats**

Statewide (Sawyer et al. 2009)

*Azolla filiculoides* or *Azolla mexicana* is dominant floating on the water surface or characteristically present in the herbaceous layer with *Egeria densa*, *Lemna minor*, *Spirodela polyrrhiza*, *Wolffia borealis*, and *Wolffiella lingulata*. Emergent plants may be present at low to high cover, including *Myriophyllum aquaticum*.

*Azolla* mats occur throughout California where conditions are favorable. Mats of both *Azolla* and *Lemna* occur under the same conditions, and either can dominate in the same water body. In California, stands are generally simple with only one or two species comprising the majority of cover.

Sonoma County

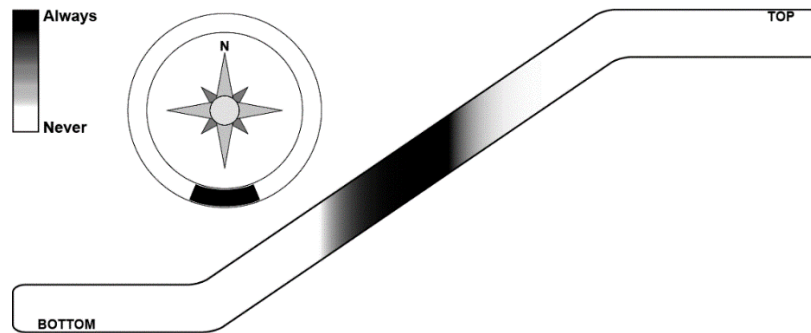
Although only one *Azolla (filiculoides, mexicana)* Alliance stand was sampled in the county, *Azolla* floating mats are probably widely scattered on ponds and slow-moving waters throughout the county. These often occupy the centers of ponds, while the edges are vegetated with emergent tall wetland species such as *Typha* spp. or *Schoenoplectus* spp.

**Local Alliance Summary (n = 1)**

**Elevation:** 982 ft

**SCV Global/State Rank:** G4/S3<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 95.0         | 95            | –          |
| <b>Herb</b>                          | 95.0         | 95            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean | Range |
|-------------------|------|-------|
| Slope             | 2.0° | 2°    |
| Large rock cover  | 0.0% | 0%    |
| Small rock cover  | 0.0% | 0%    |
| Bare ground cover | 2.0% | 2%    |
| Litter cover      | 0.0% | 0%    |

Associations within this Alliance: *none*

**STAND TABLE**

*Azolla (filiculoides, mexicana)* Provisional Alliance

n = 1

| Lifeform | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|-------|--------------------------------|-----|------|------|------|
| Herb     |       |                                |     |      |      |      |
|          | AZOLL | <i>Azolla</i>                  | 100 | 80.0 | 80.0 | 80.0 |
|          | EPCI  | <i>Epilobium ciliatum</i>      | 100 | 6.0  | 6.0  | 6.0  |
|          | POLA4 | <i>Polygonum lapathifolium</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | ALLA2 | <i>Alisma lanceolatum</i>      | 100 | 0.2  | 0.2  | 0.2  |
|          | POMO5 | <i>Polypogon monspeliensis</i> | 100 | 0.2  | 0.2  | 0.2  |

***Bolboschoenus maritimus* Alliance**  
Salt marsh bulrush marshes

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Bolboschoenus maritimus* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Atriplex prostrata*, *Bolboschoenus robustus*, *Chenopodium foliosum*, *Cotula coronopifolia*, *Distichlis spicata*, *Eleocharis macrostachya*, *Lemna minuta*, *Sarcocornia pacifica*, *Sesuvium verrucosum*, *Spergularia salina*, and *Typha latifolia*.

This alliance occurs in tidal marshes with relatively high salinity, at intermediate tidal elevations with seasonal flooding (Keeler-Wolf and Vaghti 2000, Pickart 2006). Inland marshes in areas with alkali, brackish, or fresh water contain different associates than stands found in coastal marshes.

*Bolboschoenus maritimus* usually dominates in the wetter, tidal, brackish to sub-saline marshes and ditches, including early successional sites of diked marshes within relict swales and depressions (Baye 2000).

Sonoma County

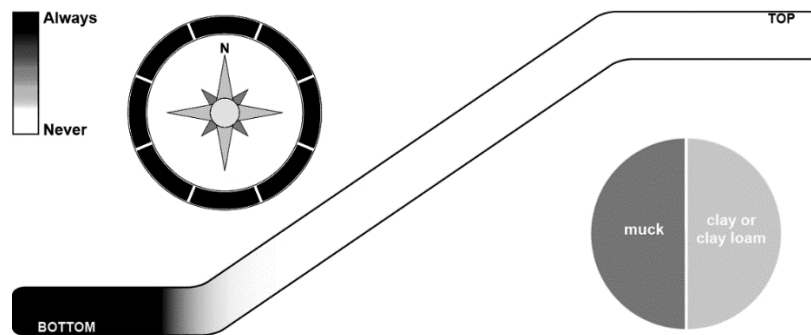
*Bolboschoenus maritimus* stands occur in outer coastal brackish lagoons or in interior tidal wetlands adjacent to San Pablo Bay. The largest and most numerous stands occur in the vicinity of Petaluma Marsh.

**Local Alliance Summary (n = 5)**

**Elevation:** 0–41 ft, mean 12 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 42.4         | 24–75         | –          |
| <b>Herb</b>             | 42.4         | 24–75         | <0.5–2     |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 1.0°  | 0–5°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 0.0%  | 0–0%  |
| <b>Bare ground cover</b> | 43.8% | 5–91% |
| <b>Litter cover</b>      | 27.2% | 2–87% |

**Associations within this Alliance:**

*Bolboschoenus maritimus* – *Sarcocornia pacifica* Association  
*Bolboschoenus maritimus* Association

**STAND TABLE**

***Bolboschoenus maritimus* Alliance**

n = 5

| Lifeform            | Code   | Botanical Name                          | Con | Avg  | Min  | Max  |
|---------------------|--------|---|-----|------|------|------|
| <b>Herb</b>         |        |   |     |      |      |      |
|                     | BOMA7  | <i>Bolboschoenus maritimus</i>          | 100 | 35.4 | 18.0 | 55.0 |
|                     | SAPA30 | <i>Sarcocornia pacifica</i>             | 80  | 4.3  | 0.2  | 15.0 |
|                     | JACA4  | <i>Jaumea carnosa</i>                   | 40  | 5.0  | 2.0  | 8.0  |
|                     | LELA2  | <i>Lepidium latifolium</i>              | 20  | 15.0 | 15.0 | 15.0 |
|                     | ATRIP  | <i>Atriplex</i>                         | 20  | 1.0  | 1.0  | 1.0  |
|                     | CAPY2  | <i>Carduus pycnocephalus</i>            | 20  | 1.0  | 1.0  | 1.0  |
|                     | DISP   | <i>Distichlis spicata</i>               | 20  | 1.0  | 1.0  | 1.0  |
|                     | GRHI   | <i>Grindelia hirsutula</i>              | 20  | 1.0  | 1.0  | 1.0  |
|                     | SCHOE6 | <i>Schoenoplectus</i>                   | 20  | 1.0  | 1.0  | 1.0  |
|                     | CUSAM  | <i>Cuscuta salina</i> var. <i>major</i> | 20  | 0.2  | 0.2  | 0.2  |
|                     | LEYMU  | <i>Leymus</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|                     | RUMEX  | <i>Rumex</i>                            | 20  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |   |     |      |      |      |
|                     | 2ALGA  | Alga                                    | 20  | 0.2  | 0.2  | 0.2  |
|                     | 2MOSS  | Moss                                    | 20  | 0.2  | 0.2  | 0.2  |

***Bolboschoenus maritimus* – *Sarcocornia pacifica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 54.0         | 33–75         | –          |
| <b>Herb</b>             | 54.0         | 33–75         | 1–2        |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), variable (1)  
**Macrotopography:** bottom (2)  
**Microtopography:** concave (1), flat (1)  
**Parent material:** mixed alluvium (1), sedimentary (1)  
**Soil texture:** muck (1)  
**Slope steepness:** flat/0° (1), gentle/1-5° (1)

|                   | Mean   | Range    |
|-------------------|--------|----------|
| Elevation         | 24 ft. | 6–41 ft. |
| Slope             | 2.5°   | 0–5°     |
| Large rock cover  | 0.0%   | 0–0%     |
| Small rock cover  | 0.0%   | 0–0%     |
| Bare ground cover | 47.5%  | 5–90%    |
| Litter cover      | 3.5%   | 2–5%     |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none  
**Relevés:** SONO0375, SONO0651

**SCV Global/State Rank:** G3?/S2?<sup>1</sup>

**STAND TABLE**

***Bolboschoenus maritimus* – *Sarcocornia pacifica* Association**

n = 2

| Lifeform | Code         | Botanical Name                          | Con  | Avg  | Min  | Max  |     |
|----------|--------------|---|------|------|------|------|-----|
| Herb     | BOMA7        | <i>Bolboschoenus maritimus</i>          | 100  | 36.5 | 18.0 | 55.0 |     |
|          | SAPA30       | <i>Sarcocornia pacifica</i>             | 100  | 8.0  | 1.0  | 15.0 |     |
|          | JACA4        | <i>Jaumea carnosa</i>                   | 100  | 5.0  | 2.0  | 8.0  |     |
|          | LELA2        | <i>Lepidium latifolium</i>              | 50   | 15.0 | 15.0 | 15.0 |     |
|          | ATRIP        | <i>Atriplex</i>                         | 50   | 1.0  | 1.0  | 1.0  |     |
|          | SCHOE6       | <i>Schoenoplectus</i>                   | 50   | 1.0  | 1.0  | 1.0  |     |
|          | GRHI         | <i>Grindelia hirsutula</i>              | 50   | 1.0  | 1.0  | 1.0  |     |
|          | CAPY2        | <i>Carduus pycnocephalus</i>            | 50   | 1.0  | 1.0  | 1.0  |     |
|          | DISP         | <i>Distichlis spicata</i>               | 50   | 1.0  | 1.0  | 1.0  |     |
|          | CUSAM        | <i>Cuscuta salina</i> var. <i>major</i> | 50   | 0.2  | 0.2  | 0.2  |     |
|          | LEYMU        | <i>Leymus</i>                           | 50   | 0.2  | 0.2  | 0.2  |     |
|          | Non-vascular | 2MOSS                                   | Moss | 50   | 0.2  | 0.2  | 0.2 |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

## ***Bolboschoenus maritimus* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 34.7                | 24–50                | –                 |
| <b>Herb</b>                          | 34.7                | 24–50                | <0.5–2            |
| <b>Shrub</b>                         | 0.0                 | 0–0                  | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (3)

**Macrotopography:** bottom (3)

**Microtopography:** flat (3)

**Parent material:** mixed alluvium (2), sandy alluvium (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (3)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 4 ft.       | 0–7 ft.      |
| <b>Slope</b>             | 0.0°        | 0–0°         |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 0.0%        | 0–0%         |
| <b>Bare ground cover</b> | 41.3%       | 5–91%        |
| <b>Litter cover</b>      | 43.0%       | 2–87%        |

### **Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0671

**Relevés:** SONO0427, SONO0649

**SCV Global/State Rank:** G4/S3<sup>1</sup>

### **STAND TABLE**

#### ***Bolboschoenus maritimus* Association**

n = 3

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         | BOMA7       | <i>Bolboschoenus maritimus</i> | 100        | 34.7       | 24.0       | 50.0       |
|                     | SAPA30      | <i>Sarcocornia pacifica</i>    | 67         | 0.6        | 0.2        | 1.0        |
|                     | RUMEX       | <i>Rumex</i>                   | 33         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> | 2ALGA       | Alga                           | 33         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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## ***Brassica nigra* and Other Mustards Semi-Natural Alliance**

### **Upland mustards**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Brassica nigra*, *Brassica rapa*, *Brassica tournefortii*, *Hirschfeldia incana*, *Isatis tinctoria* or *Raphanus sativus* is dominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover.

These six mustards are combined as a singular type based on their ecological similarities, though in Sonoma County, *Brassica nigra* and *Raphanus sativus* are the most common species. They form dense colonies that overtop most other plants whether they be native or non-native. All respond positively to regular frequent disturbance, whether it be fire, disking, intermittent flooding, or heavy grazing. *Brassica nigra* was one of the early invaders and has been a part of the California landscape for over 200 years (D'Antonio et al. 2007). The six species, however, tend to segregate by moisture and temperature tolerance. Local and regional studies can recognize stand types characterized by a single mustard.

*Brassica nigra*, black mustard, forms dense stands in coastal to inland grasslands with mild winter climates, especially in areas that have been plowed or left fallow. *Raphanus sativus* grows throughout cismontane California at lower elevations in grasslands, meadows, coastal scrubs, and disturbed waste places.

### Sonoma County

Stands of wild radish (*Raphanus sativus*) occur in grazed or formerly plowed lands near the coast in Sonoma County. Black mustard stands (*Brassica nigra*) tend to occur inland in disturbed locations either associated with cultivation or grazing, or with natural disturbance such as riverine gravels (fluvial disturbance).

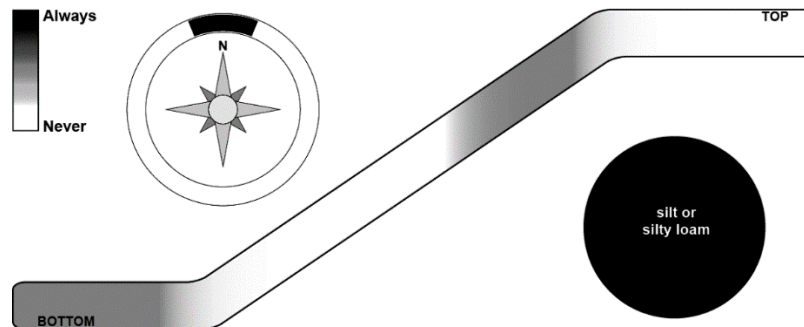
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### **Local Alliance Summary (n = 2)**

**Elevation:** 165–193 ft, mean 179 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 18.0         | 18–18 <sup>1</sup> | –          |
| <b>Herb</b>                          | 44.0         | 18–70              | 0.5–1      |
| <b>Shrub</b>                         | 1.5          | 0–3                | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 4.5°  | 1–8°   |
| <b>Large rock cover</b>  | 0.1%  | 0–0.2% |
| <b>Small rock cover</b>  | 27.0% | 1–53%  |
| <b>Bare ground cover</b> | 23.0% | 2–44%  |
| <b>Litter cover</b>      | 46.5% | 2–91%  |

**Associations within this Alliance:**

*Brassica nigra* Semi-Natural Association  
*Raphanus sativus* Semi-Natural Association

**STAND TABLE**

***Brassica nigra* and other mustards Provisional Semi-Natural Alliance**

n = 2

| Lifeform     | Code   | Botanical Name                                     | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> |        |  |     |      |      |      |
|              | LUAR   | <i>Lupinus arboreus</i>                            | 50  | 3.0  | 3.0  | 3.0  |
| <b>Herb</b>  |        |  |     |      |      |      |
|              | BRDI3  | <i>Bromus diandrus</i>                             | 100 | 4.1  | 0.2  | 8.0  |
|              | BRMA   | <i>Briza maxima</i>                                | 100 | 1.6  | 0.2  | 3.0  |
|              | ESCA2  | <i>Eschscholzia californica</i>                    | 100 | 1.6  | 0.2  | 3.0  |
|              | LOPE   | <i>Lolium perenne</i>                              | 100 | 1.6  | 0.2  | 3.0  |
|              | RASA2  | <i>Raphanus sativus</i>                            | 50  | 38.0 | 38.0 | 38.0 |
|              | BRNI   | <i>Brassica nigra</i>                              | 50  | 15.0 | 15.0 | 15.0 |
|              | VUBR   | <i>Vulpia bromoides</i>                            | 50  | 8.0  | 8.0  | 8.0  |
|              | ANAR   | <i>Anagallis arvensis</i>                          | 50  | 3.0  | 3.0  | 3.0  |
|              | BRCA5  | <i>Bromus carinatus</i>                            | 50  | 3.0  | 3.0  | 3.0  |
|              | CAPY2  | <i>Carduus pycnocephalus</i>                       | 50  | 3.0  | 3.0  | 3.0  |
|              | CIVU   | <i>Cirsium vulgare</i>                             | 50  | 3.0  | 3.0  | 3.0  |
|              | CLPEP  | <i>Claytonia perfoliata</i> ssp. <i>perfoliata</i> | 50  | 3.0  | 3.0  | 3.0  |
|              | RUAC3  | <i>Rumex acetosella</i>                            | 50  | 3.0  | 3.0  | 3.0  |
|              | SOAS   | <i>Sonchus asper</i>                               | 50  | 3.0  | 3.0  | 3.0  |
|              | STAJ   | <i>Stachys ajugoides</i>                           | 50  | 3.0  | 3.0  | 3.0  |
|              | MELA2  | <i>Mentzelia laevicaulis</i>                       | 50  | 1.0  | 1.0  | 1.0  |
|              | ACMI2  | <i>Achillea millefolium</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|              | AGROS2 | <i>Agrostis</i>                                    | 50  | 0.2  | 0.2  | 0.2  |
|              | ARDO3  | <i>Artemisia douglasiana</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|              | CESO3  | <i>Centaurea solstitialis</i>                      | 50  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

**STAND TABLE** continued

***Brassica nigra* and other mustards Provisional Semi-Natural Alliance**

n = 2

| Lifeform | Code   | Botanical Name                                   | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Herb     |        |  |     |     |     |     |
|          | CEAR4  | <i>Cerastium arvense</i>                         | 50  | 0.2 | 0.2 | 0.2 |
|          | ERCI6  | <i>Erodium cicutarium</i>                        | 50  | 0.2 | 0.2 | 0.2 |
|          | FOVU   | <i>Foeniculum vulgare</i>                        | 50  | 0.2 | 0.2 | 0.2 |
|          | GAAP2  | <i>Galium aparine</i>                            | 50  | 0.2 | 0.2 | 0.2 |
|          | GEDI   | <i>Geranium dissectum</i>                        | 50  | 0.2 | 0.2 | 0.2 |
|          | HEOR2  | <i>Heterotheca oregona</i>                       | 50  | 0.2 | 0.2 | 0.2 |
|          | HYRA3  | <i>Hypochaeris radicata</i>                      | 50  | 0.2 | 0.2 | 0.2 |
|          | LOHU2  | <i>Lotus humistratus</i>                         | 50  | 0.2 | 0.2 | 0.2 |
|          | MEOF   | <i>Melilotus officinalis</i>                     | 50  | 0.2 | 0.2 | 0.2 |
|          | PETRO  | <i>Petrorhagia</i>                               | 50  | 0.2 | 0.2 | 0.2 |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 50  | 0.2 | 0.2 | 0.2 |
|          | SIGA   | <i>Silene gallica</i>                            | 50  | 0.2 | 0.2 | 0.2 |
|          | SOSE2  | <i>Soliva sessilis</i>                           | 50  | 0.2 | 0.2 | 0.2 |
|          | SOOL   | <i>Sonchus oleraceus</i>                         | 50  | 0.2 | 0.2 | 0.2 |
|          | VERBA  | <i>Verbascum</i>                                 | 50  | 0.2 | 0.2 | 0.2 |
|          | VISA   | <i>Vicia sativa</i>                              | 50  | 0.2 | 0.2 | 0.2 |
|          | GNAPH  | <i>Gnaphalium</i>                                | 50  | 0.1 | 0.1 | 0.1 |

***Brassica nigra* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 18.0         | 18            | –          |
| <b>Herb</b>                          | 18.0         | 18            | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1)

**Macrotopography:** Bottom (1)

**Microtopography:** flat (1)

**Parent material:** Mixed alluvium (1)

**Soil texture:** No data

**Slope steepness:** gentle/1-5° (1)

|                         | Mean    | Range   |
|-------------------------|---------|---------|
| <b>Elevation</b>        | 193 ft. | 193 ft. |
| <b>Slope</b>            | 1.0°    | 1°      |
| <b>Large rock cover</b> | 0.2%    | 0.2%    |

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|                   | Mean  | Range |
|-------------------|-------|-------|
| Small rock cover  | 53.0% | 53%   |
| Bare ground cover | 44.0% | 44%   |
| Litter cover      | 2.0%  | 2%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0782

**Relevés:** none

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Brassica nigra* Semi-Natural Association**

n = 1

| Lifeform | Code   | Botanical Name                  | Con | Avg  | Min  | Max  |
|----------|--------|---------------------------------|-----|------|------|------|
| Herb     |        |                                 |     |      |      |      |
|          | BRNI   | <i>Brassica nigra</i>           | 100 | 15.0 | 15.0 | 15.0 |
|          | MELA2  | <i>Mentzelia laevicaulis</i>    | 100 | 1.0  | 1.0  | 1.0  |
|          | BRMA   | <i>Briza maxima</i>             | 100 | 0.2  | 0.2  | 0.2  |
|          | AGROS2 | <i>Agrostis</i>                 | 100 | 0.2  | 0.2  | 0.2  |
|          | BRDI3  | <i>Bromus diandrus</i>          | 100 | 0.2  | 0.2  | 0.2  |
|          | CESO3  | <i>Centaurea solstitialis</i>   | 100 | 0.2  | 0.2  | 0.2  |
|          | ESCA2  | <i>Eschscholzia californica</i> | 100 | 0.2  | 0.2  | 0.2  |
|          | ARDO3  | <i>Artemisia douglasiana</i>    | 100 | 0.2  | 0.2  | 0.2  |
|          | FOVU   | <i>Foeniculum vulgare</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | HEOR2  | <i>Heterotheca oregona</i>      | 100 | 0.2  | 0.2  | 0.2  |
|          | LOPE   | <i>Lolium perenne</i>           | 100 | 0.2  | 0.2  | 0.2  |
|          | LOHU2  | <i>Lotus humistratus</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | PETRO  | <i>Petrorhagia</i>              | 100 | 0.2  | 0.2  | 0.2  |
|          | VERBA  | <i>Verbascum</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | MEOF   | <i>Melilotus officinalis</i>    | 100 | 0.2  | 0.2  | 0.2  |

***Raphanus sativus* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Herb                          | 70.0         | 70            | –          |
| Shrub                         | 3.0          | 3             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1)

**Macrotopography:** upper 1/3 of slope (1)

**Microtopography:** flat (1)

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**Summary of Environmental Data, continued**

**Parent material:** igneous (1)

**Soil texture:** silt or silt loam (1)

**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 165 ft. | 165 ft. |
| <b>Slope</b>             | 8.0°    | 8°      |
| <b>Large rock cover</b>  | 0.0%    | 0%      |
| <b>Small rock cover</b>  | 1.0%    | 1%      |
| <b>Bare ground cover</b> | 2.0%    | 2%      |
| <b>Litter cover</b>      | 91.0%   | 91%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** HEAD0010

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Raphanus sativus* Semi-Natural Association**

n = 1

| Lifeform | Code   | Botanical Name                                     | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | LUAR   | <i>Lupinus arboreus</i>                            | 100 | 3.0  | 3.0  | 3.0  |
| Herb     | RASA2  | <i>Raphanus sativus</i>                            | 100 | 38.0 | 38.0 | 38.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                             | 100 | 8.0  | 8.0  | 8.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                            | 100 | 8.0  | 8.0  | 8.0  |
|          | STAJ   | <i>Stachys ajugoides</i>                           | 100 | 3.0  | 3.0  | 3.0  |
|          | LOPE   | <i>Lolium perenne</i>                              | 100 | 3.0  | 3.0  | 3.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                    | 100 | 3.0  | 3.0  | 3.0  |
|          | CLPEP  | <i>Claytonia perfoliata</i> ssp. <i>perfoliata</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | RUAC3  | <i>Rumex acetosella</i>                            | 100 | 3.0  | 3.0  | 3.0  |
|          | SOAS   | <i>Sonchus asper</i>                               | 100 | 3.0  | 3.0  | 3.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                       | 100 | 3.0  | 3.0  | 3.0  |
|          | BRCA5  | <i>Bromus carinatus</i>                            | 100 | 3.0  | 3.0  | 3.0  |
|          | BRMA   | <i>Briza maxima</i>                                | 100 | 3.0  | 3.0  | 3.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                          | 100 | 3.0  | 3.0  | 3.0  |
|          | CIVU   | <i>Cirsium vulgare</i>                             | 100 | 3.0  | 3.0  | 3.0  |
|          | GEDI   | <i>Geranium dissectum</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|          | SOSE2  | <i>Soliva sessilis</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|          | SIGA   | <i>Silene gallica</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | GAAP2  | <i>Galium aparine</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|          | ERCI6  | <i>Erodium cicutarium</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|          | CEAR4  | <i>Cerastium arvense</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|          | ACMI2  | <i>Achillea millefolium</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | SOOL   | <i>Sonchus oleraceus</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|          | VISA   | <i>Vicia sativa</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>   | 100 | 0.2  | 0.2  | 0.2  |
|          | GNAPH  | <i>Gnaphalium</i>                                  | 100 | 0.1  | 0.1  | 0.1  |

## ***Calamagrostis nutkaensis* Alliance**

### **Pacific reed grass meadows**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Calamagrostis nutkaensis* is dominant or co-dominant in the herbaceous layer with *Anthoxanthum odoratum*, *Artemisia suksdorfii*, *Elymus glaucus*, *Festuca arundinacea*, *Festuca rubra*, *Heracleum maximum*, *Holcus lanatus*, and *Pteridium aquilinum*. Emergent trees and shrubs may be present at low cover, including *Picea sitchensis*, *Baccharis pilularis*, *Gaultheria shallon*, *Rubus* spp., or *Vaccinium ovatum*.

Often considered part of the coastal prairie (Bartolome 1994, Hektner and Foin 1977), the alliance occupies the coastal terraces and mixes with the *Danthonia californica* and *Deschampsia cespitosa* Alliances at a fine scale. The alliance also occurs in freshwater swales, depressions, and springs, mixed with other wetland herbaceous types. It forms tall grasslands on moist coastal bluffs at the southern extent of its range. On the broad scale, *Calamagrostis nutkaensis* stands mix with forested stands of the *Alnus rubra* and *Picea sitchensis* Alliances, and shrublands of the *Baccharis pilularis*, *Lupinus arboreus*, *Salix hookeriana*, and *Rubus* spp. Alliances.

#### Sonoma County

All *Calamagrostis nutkaensis* stands sampled in the county occur within 1 km of the coast and are typically on exposed coastal terraces. In some cases, such as at Ft. Ross State Park, stands have colonized formerly cultivated or mowed fields. The *Calamagrostis nutkaensis* individuals are usually taller than the associated *Baccharis pilularis* shrubs and concentrate fog drip, thus enhancing their local moisture conditions through condensation. In some instances, *Calamagrostis nutkaensis* stands occur as mesic openings surrounded by *Pinus muricata* forest. In such conditions the co-dominant species may be the locally restricted *Veratrum fimbriatum* (fringed corn-lily), which is listed as a California rare plant with a rank of 4.3.

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#### **Local Alliance Summary (n = 9)**

**Elevation:** 44–351 ft, mean 175 ft

**SCV Global/State Rank:** G4/S2<sup>2</sup>

#### **Noteworthy Taxa**

*Campanula californica*

CA rare plant rank: 1B.2

NatureServe global/state rank: G3/S3

*Lasthenia californica* ssp. *bakeri*

CA rare plant rank: 1B.2

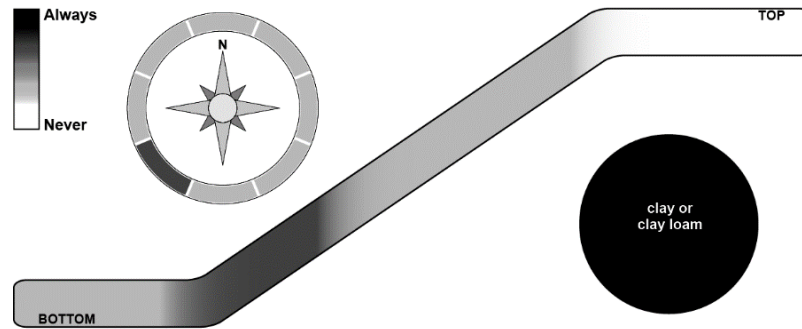
NatureServe global/state rank: G3TH/SH

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 61.0         | 57–65 <sup>1</sup> | –          |
| <b>Herb</b>                          | 78.9         | 38–95              | 1–2        |
| <b>Shrub</b>                         | 12.8         | 0.2–45             | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.1          | 0–1                | 2–5        |
| <b>Conifer</b>                       | 2.3          | 0–20               | 2–15       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 5.0°  | 0–15°  |
| <b>Large rock cover</b>  | 0.1%  | 0–1%   |
| <b>Small rock cover</b>  | 0.0%  | 0–0%   |
| <b>Bare ground cover</b> | 2.8%  | 0–12%  |
| <b>Litter cover</b>      | 67.9% | 29–90% |

**Associations within this Alliance:**

*Calamagrostis nutkaensis* / *Baccharis pilularis* Association

**STAND TABLE**

***Calamagrostis nutkaensis* Alliance**

n = 9

| Lifeform     | Code   | Botanical Name                              | Con | Avg  | Min  | Max  |
|--------------|--------|---|-----|------|------|------|
| <b>Tree</b>  | PIMU   | <i>Pinus muricata</i>                       | 22  | 2.0  | 1.0  | 3.0  |
| <b>Shrub</b> | BAPI   | <i>Baccharis pilularis</i>                  | 89  | 10.4 | 3.0  | 38.0 |
|              | RUUR   | <i>Rubus ursinus</i>                        | 89  | 3.6  | 0.2  | 8.0  |
| <b>Herb</b>  | CANU   | <i>Calamagrostis nutkaensis</i>             | 100 | 67.8 | 15.0 | 88.0 |
|              | HOLA   | <i>Holcus lanatus</i>                       | 67  | 1.4  | 0.2  | 3.0  |
|              | HEMA80 | <i>Heracleum maximum</i>                    | 56  | 5.9  | 0.2  | 18.0 |
|              | JUPA2  | <i>Juncus patens</i>                        | 56  | 2.3  | 0.2  | 8.0  |
|              | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i> | 44  | 1.6  | 0.2  | 3.0  |

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Calamagrostis nutkaensis* Alliance**

n = 9

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     |        |  |     |      |     |      |
|          | CIVU   | <i>Cirsium vulgare</i>                           | 44  | 0.9  | 0.2 | 3.0  |
|          | ERMI8  | <i>Erechtites minimus</i>                        | 44  | 0.9  | 0.2 | 3.0  |
|          | STAJ   | <i>Stachys ajugoides</i>                         | 44  | 0.9  | 0.2 | 3.0  |
|          | POMU   | <i>Polystichum munitum</i>                       | 33  | 5.0  | 3.0 | 9.0  |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33  | 4.0  | 1.0 | 8.0  |
|          | GAAP2  | <i>Galium aparine</i>                            | 33  | 2.1  | 0.2 | 3.0  |
|          | LOAN2  | <i>Lotus angustissimus</i>                       | 33  | 1.1  | 0.2 | 3.0  |
|          | RUAC3  | <i>Rumex acetosella</i>                          | 33  | 0.5  | 0.2 | 1.0  |
|          | AICA   | <i>Aira caryophyllea</i>                         | 33  | 0.2  | 0.2 | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 33  | 0.2  | 0.2 | 0.2  |
|          | CAGY3  | <i>Carex gynodynama</i>                          | 33  | 0.2  | 0.2 | 0.2  |
|          | CATU3  | <i>Carex tumulicola</i>                          | 33  | 0.2  | 0.2 | 0.2  |
|          | EPILO  | <i>Epilobium</i>                                 | 33  | 0.2  | 0.2 | 0.2  |
|          | ERECH  | <i>Erechtites</i>                                | 33  | 0.2  | 0.2 | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>                             | 33  | 0.2  | 0.2 | 0.2  |
|          | IRDO   | <i>Iris douglasiana</i>                          | 33  | 0.2  | 0.1 | 0.2  |
|          | LYHY3  | <i>Lythrum hyssopifolium</i>                     | 33  | 0.2  | 0.1 | 0.2  |
|          | VEFI2  | <i>Veratrum fimbriatum</i>                       | 22  | 18.5 | 8.0 | 29.0 |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 22  | 3.1  | 0.2 | 6.0  |
|          | ANOD   | <i>Anthoxanthum odoratum</i>                     | 22  | 1.6  | 0.2 | 3.0  |
|          | CAREX  | <i>Carex</i>                                     | 22  | 1.6  | 0.2 | 3.0  |
|          | CAOB3  | <i>Carex obnupta</i>                             | 22  | 1.6  | 0.2 | 3.0  |
|          | JUNCU  | <i>Juncus</i>                                    | 22  | 1.6  | 0.2 | 3.0  |
|          | ANMA   | <i>Anaphalis margaritacea</i>                    | 22  | 0.2  | 0.2 | 0.2  |
|          | ANHE   | <i>Angelica hendersonii</i>                      | 22  | 0.2  | 0.2 | 0.2  |
|          | CAOV8  | <i>Carex ovalis</i>                              | 22  | 0.2  | 0.2 | 0.2  |
|          | DACA3  | <i>Danthonia californica</i>                     | 22  | 0.2  | 0.2 | 0.2  |
|          | DECE   | <i>Deschampsia cespitosa</i>                     | 22  | 0.2  | 0.2 | 0.2  |
|          | JUBU   | <i>Juncus bufonius</i>                           | 22  | 0.2  | 0.2 | 0.2  |
|          | JUPH   | <i>Juncus phaeocephalus</i>                      | 22  | 0.2  | 0.2 | 0.2  |
|          | LUCO6  | <i>Luzula comosa</i>                             | 22  | 0.2  | 0.2 | 0.2  |
|          | MASA   | <i>Madia sativa</i>                              | 22  | 0.2  | 0.2 | 0.2  |
|          | MEPU   | <i>Mentha pulegium</i>                           | 22  | 0.2  | 0.2 | 0.2  |
|          | NAVAR  | <i>Navarretia</i>                                | 22  | 0.2  | 0.2 | 0.2  |
|          | VISA   | <i>Vicia sativa</i>                              | 22  | 0.2  | 0.2 | 0.2  |
|          | BRMI2  | <i>Briza minor</i>                               | 22  | 0.2  | 0.1 | 0.2  |

**Noteworthy Taxa**

*Campanula californica*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G3/S3

*Lasthenia californica* ssp. *bakeri*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G3TH/SH



## ***Calamagrostis nutkaensis* / *Baccharis pilularis* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) and Coastal Hills-Santa Rosa Plain/263Aj (4) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 65.0                | 65 <sup>1</sup>      | –                 |
| <b>Herb</b>                          | 81.6                | 38–95                | 1–2               |
| <b>Shrub</b>                         | 14.4                | 2–45                 | 1–2               |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 2.5                 | 0–20                 | 2–5               |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (1), NE (1), SW (6)

**Macrotopography:** lower 1/3 of slope (6), middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (2), flat (6)

**Parent material:** metasedimentary (2), sedimentary (5)

**Soil texture:** clay or clay loam (6)

**Slope steepness:** flat/0° (1), gentle/1-5° (4), moderate/6-25° (3)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 154 ft.     | 44–300 ft.   |
| <b>Slope</b>             | 5.0°        | 0–15°        |
| <b>Large rock cover</b>  | 0.1%        | 0–1%         |
| <b>Small rock cover</b>  | 0.0%        | 0–0.2%       |
| <b>Bare ground cover</b> | 2.5%        | 0–12%        |
| <b>Litter cover</b>      | 65.1%       | 29–85%       |

### **Samples Used to Describe Association (n=8)**

**Rapid Assessments:** SONO0454

**Relevés:** HEAD0012, HEAD0114, HEAD0116, HEAD0199, HEAD0301, HEAD0322, HEAD0377

**SCV Global/State Rank:** G3?/S2<sup>2</sup>

### **STAND TABLE**

#### ***Calamagrostis nutkaensis* / *Baccharis pilularis* Association**

n = 8

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Shrub</b>    | BAPI        | <i>Baccharis pilularis</i>      | 100        | 10.4       | 3.0        | 38.0       |
|                 | RUUR        | <i>Rubus ursinus</i>            | 88         | 4.0        | 0.2        | 8.0        |
| <b>Herb</b>     | CANU        | <i>Calamagrostis nutkaensis</i> | 100        | 73.9       | 15.0       | 88.0       |
|                 | HEMA80      | <i>Heracleum maximum</i>        | 63         | 5.9        | 0.2        | 18.0       |

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Calamagrostis nutkaensis* / *Baccharis pilularis* Association**

n = 8

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | JUPA2       | <i>Juncus patens</i>                             | 63         | 2.3        | 0.2        | 8.0        |
|                 | HOLA        | <i>Holcus lanatus</i>                            | 63         | 1.3        | 0.2        | 3.0        |
|                 | JUEFP       | <i>Juncus effusus</i> var. <i>pacificus</i>      | 50         | 1.6        | 0.2        | 3.0        |
|                 | CIVU        | <i>Cirsium vulgare</i>                           | 50         | 0.9        | 0.2        | 3.0        |
|                 | ERMI8       | <i>Erechtites minimus</i>                        | 50         | 0.9        | 0.2        | 3.0        |
|                 | STAJ        | <i>Stachys ajugoides</i>                         | 50         | 0.9        | 0.2        | 3.0        |
|                 | GAAP2       | <i>Galium aparine</i>                            | 38         | 2.1        | 0.2        | 3.0        |
|                 | LOAN2       | <i>Lotus angustissimus</i>                       | 38         | 1.1        | 0.2        | 3.0        |
|                 | RUAC3       | <i>Rumex acetosella</i>                          | 38         | 0.5        | 0.2        | 1.0        |
|                 | CATU3       | <i>Carex tumulicola</i>                          | 38         | 0.2        | 0.2        | 0.2        |
|                 | SOAS        | <i>Sonchus asper</i>                             | 38         | 0.2        | 0.2        | 0.2        |
|                 | EPILO       | <i>Epilobium</i>                                 | 38         | 0.2        | 0.2        | 0.2        |
|                 | ANAR        | <i>Anagallis arvensis</i>                        | 38         | 0.2        | 0.2        | 0.2        |
|                 | AICA        | <i>Aira caryophylla</i>                          | 38         | 0.2        | 0.2        | 0.2        |
|                 | CAGY3       | <i>Carex gynodynamis</i>                         | 38         | 0.2        | 0.2        | 0.2        |
|                 | IRDO        | <i>Iris douglasiana</i>                          | 38         | 0.2        | 0.1        | 0.2        |
|                 | LYHY3       | <i>Lythrum hyssopifolium</i>                     | 38         | 0.2        | 0.1        | 0.2        |
|                 | PTAQP2      | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 25         | 4.5        | 1.0        | 8.0        |
|                 | ACMI2       | <i>Achillea millefolium</i>                      | 25         | 3.1        | 0.2        | 6.0        |
|                 | POMU        | <i>Polystichum munitum</i>                       | 25         | 3.0        | 3.0        | 3.0        |
|                 | ANOD        | <i>Anthoxanthum odoratum</i>                     | 25         | 1.6        | 0.2        | 3.0        |
|                 | JUNCU       | <i>Juncus</i>                                    | 25         | 1.6        | 0.2        | 3.0        |
|                 | CAREX       | <i>Carex</i>                                     | 25         | 1.6        | 0.2        | 3.0        |
|                 | CAOB3       | <i>Carex obnupta</i>                             | 25         | 1.6        | 0.2        | 3.0        |
|                 | JUPH        | <i>Juncus phaeocephalus</i>                      | 25         | 0.2        | 0.2        | 0.2        |
|                 | ANMA        | <i>Anaphalis margaritacea</i>                    | 25         | 0.2        | 0.2        | 0.2        |
|                 | NAVAR       | <i>Navarretia</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | VISA        | <i>Vicia sativa</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | MEPU        | <i>Mentha pulegium</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                 | MASA        | <i>Madia sativa</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | LUCO6       | <i>Luzula comosa</i>                             | 25         | 0.2        | 0.2        | 0.2        |
|                 | JUBU        | <i>Juncus bufonius</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                 | ERECH       | <i>Erechtites</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | DECE        | <i>Deschampsia cespitosa</i>                     | 25         | 0.2        | 0.2        | 0.2        |
|                 | DACA3       | <i>Danthonia californica</i>                     | 25         | 0.2        | 0.2        | 0.2        |
|                 | ANHE        | <i>Angelica hendersonii</i>                      | 25         | 0.2        | 0.2        | 0.2        |
|                 | CAOV8       | <i>Carex ovalis</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>                               | 25         | 0.2        | 0.1        | 0.2        |

**Noteworthy Taxa**

*Campanula californica*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G3/S3

*Lasthenia californica* ssp. *bakeri*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G3TH/SH

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## ***Carex (pansa, praegracilis)* Provisional Alliance**

### **Sand dune and foothill sedge meadows**

Statewide (Sawyer et al. 2009)

*Carex pansa* or *Carex praegracilis* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Artemisia pycnocephala*, *Briza maxima*, *Camissonia cheiranthifolia*, *Cardionema ramosissimum*, *Carpobrotus chilensis*, *Erigeron glaucus*, *Holcus lanatus*, *Juncus effusus*, *Juncus patens*, *Lotus* spp., *Plantago* spp., *Poa douglasii*, and *Pteridium aquilinum*. Emergent shrubs may be present at low cover, including *Baccharis pilularis* or *Lotus scoparius*.

In the Monterey Bay area, stands of *Carex pansa* usually occur in swales in inter-dunes along the coast. Adjacent stands are those of the *Abronia latifolia*-*Ambrosia chamissonis* and *Baccharis pilularis* Alliances.

Rhizomatous stands of the morphologically and ecologically similar *Carex praegracilis* and *C. pansa* occur in mesic to seasonally wet conditions along the coast, or in swales of the foothills and lower mountains around the state. These two species have been combined in the revised version of the National Vegetation Classification (NVC). *Carex pansa* and *C. praegracilis* may coexist in stands near the coast, but *Carex pansa* does not exist inland in California.

#### Sonoma County

Most sampled *Carex (pansa, praegracilis)* stands occur within about 7 km from the coast. Those on the immediate coast are commonly associated with the *Calamagrostis nutkaensis* or *Juncus (effusus, patens)* Alliances or other coastal terrace herbaceous stands, while those farther inland are associated with slightly less moist vegetation such as *Danthonia californica* Alliance stands.

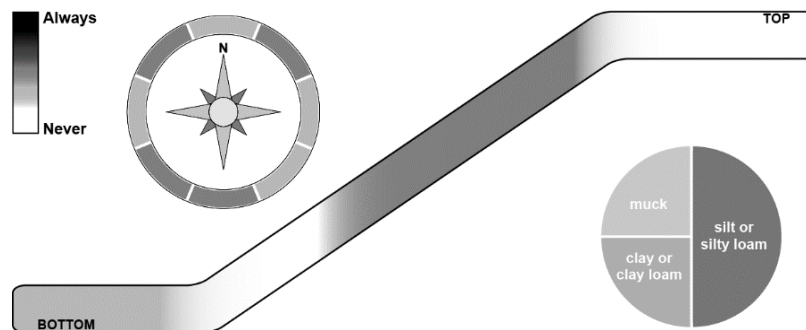
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#### **Local Alliance Summary (n = 5)**

**Elevation:** 21–1306 ft, mean 608 ft

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 49.3         | 34–70 <sup>1</sup> | –          |
| <b>Herb</b>                          | 56.6         | 34–85              | <0.5–1     |
| <b>Shrub</b>                         | 0.2          | 0–1                | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 7.8°  | 0–18°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.0%  | 0–0%   |
| <b>Bare ground cover</b> | 5.0%  | 0–13%  |
| <b>Litter cover</b>      | 85.8% | 80–96% |

**Associations within this Alliance:**

*Carex praegracilis* Provisional Association

**STAND TABLE**

***Carex (pansa, praegracilis)* Provisional Alliance**

n = 5

| Lifeform     | Code                         | Botanical Name             | Con | Avg  | Min  | Max  |
|--------------|------------------------------|----------------------------|-----|------|------|------|
| <b>Shrub</b> | BAPI                         | <i>Baccharis pilularis</i> | 20  | 3.0  | 3.0  | 3.0  |
|              | ROSA5                        | <i>Rosa</i>                | 20  | 0.2  | 0.2  | 0.2  |
|              | RUUR                         | <i>Rubus ursinus</i>       | 20  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  | HOLA                         | <i>Holcus lanatus</i>      | 60  | 22.7 | 0.2  | 38.0 |
|              | CAPR5                        | <i>Carex praegracilis</i>  | 60  | 20.0 | 6.0  | 36.0 |
|              | JUPA2                        | <i>Juncus patens</i>       | 60  | 2.0  | 1.0  | 3.0  |
|              | PLLA                         | <i>Plantago lanceolata</i> | 60  | 0.5  | 0.2  | 1.0  |
|              | GEDI                         | <i>Geranium dissectum</i>  | 60  | 0.2  | 0.2  | 0.2  |
|              | CATU3                        | <i>Carex tumulicola</i>    | 40  | 44.0 | 18.0 | 70.0 |
|              | LOPE                         | <i>Lolium perenne</i>      | 40  | 7.6  | 0.2  | 15.0 |
|              | CIVU                         | <i>Cirsium vulgare</i>     | 40  | 0.6  | 0.2  | 1.0  |
|              | AREG                         | <i>Argentina egedii</i>    | 40  | 0.2  | 0.2  | 0.2  |
|              | BRHO2                        | <i>Bromus hordeaceus</i>   | 40  | 0.2  | 0.2  | 0.2  |
|              | RUAC3                        | <i>Rumex acetosella</i>    | 40  | 0.2  | 0.2  | 0.2  |
|              | RUCR                         | <i>Rumex crispus</i>       | 40  | 0.2  | 0.2  | 0.2  |
|              | VISA                         | <i>Vicia sativa</i>        | 40  | 0.2  | 0.2  | 0.2  |
|              | IRDO                         | <i>Iris douglasiana</i>    | 20  | 18.0 | 18.0 | 18.0 |
|              | HOLCU                        | <i>Holcus</i>              | 20  | 12.0 | 12.0 | 12.0 |
|              | HEMA80                       | <i>Heracleum maximum</i>   | 20  | 8.0  | 8.0  | 8.0  |
|              | NALE2                        | <i>Nassella lepida</i>     | 20  | 6.0  | 6.0  | 6.0  |
| CAOL         | <i>Cardamine oligosperma</i> | 20                         | 1.0 | 1.0  | 1.0  |      |
| LETR5        | <i>Leymus triticoides</i>    | 20                         | 1.0 | 1.0  | 1.0  |      |

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

**STAND TABLE** continued

**Carex (pansa, praeegracilis) Provisional Alliance**

n = 5

| Lifeform | Code   | Botanical Name                                   | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Herb     | ACMI2  | <i>Achillea millefolium</i>                      | 20  | 0.2 | 0.2 | 0.2 |
|          | AVBA   | <i>Avena barbata</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|          | BRCA5  | <i>Bromus carinatus</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                     | 20  | 0.2 | 0.2 | 0.2 |
|          | CAGY3  | <i>Carex gynodynema</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|          | CAOV8  | <i>Carex ovalis</i>                              | 20  | 0.2 | 0.2 | 0.2 |
|          | COMA2  | <i>Conium maculatum</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|          | ELGL   | <i>Elymus glaucus</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|          | GAAP2  | <i>Galium aparine</i>                            | 20  | 0.2 | 0.2 | 0.2 |
|          | JULE   | <i>Juncus lesueurii</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|          | LATHY  | <i>Lathyrus</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|          | MYDI   | <i>Myosotis discolor</i>                         | 20  | 0.2 | 0.2 | 0.2 |
|          | POPR   | <i>Poa pratensis</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|          | POTR2  | <i>Poa trivialis</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|          | POTEN  | <i>Potentilla</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 20  | 0.2 | 0.2 | 0.2 |
|          | RACA2  | <i>Ranunculus californicus</i>                   | 20  | 0.2 | 0.2 | 0.2 |
|          | RUMEX  | <i>Rumex</i>                                     | 20  | 0.2 | 0.2 | 0.2 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                       | 20  | 0.2 | 0.2 | 0.2 |
|          | SOOL   | <i>Sonchus oleraceus</i>                         | 20  | 0.2 | 0.2 | 0.2 |
|          | STCH   | <i>Stachys chamissonis</i>                       | 20  | 0.2 | 0.2 | 0.2 |
|          | ERGL11 | <i>Erechtites glomeratus</i>                     | 20  | 0.1 | 0.1 | 0.1 |

**Carex praeegracilis Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 42.3         | 34–55         | –          |
| <b>Herb</b>                          | 42.3         | 34–55         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SW (2)

**Macrotopography:** middle 1/3 of slope (2), upper 1/3 of slope (1)

**Microtopography:** concave (1), flat (2)

**Parent material:** Franciscan melange (1), metasedimentary (2)

**Soil texture:** muck (1), silt or silt loam (2)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (1)

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|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 895 ft. | 464–1306 ft. |
| Slope             | 11.5°   | 5–18°        |
| Large rock cover  | 0.0%    | 0–0%         |
| Small rock cover  | 0.0%    | 0–0%         |
| Bare ground cover | 8.1%    | 0–13%        |
| Litter cover      | 82.7%   | 80–85%       |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** SONO0406, SONO0410, SONO0476

**SCV Global/State Rank:** G3?/S3<sup>1</sup>

**STAND TABLE**

**Carex praegracilis Provisional Association**

n = 3

| Lifeform | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|-------|--------------------------------|-----|------|------|------|
| Herb     |       |                                |     |      |      |      |
|          | CAPR5 | <i>Carex praegracilis</i>      | 100 | 20.0 | 6.0  | 36.0 |
|          | HOLA  | <i>Holcus lanatus</i>          | 67  | 15.1 | 0.2  | 30.0 |
|          | LOPE  | <i>Lolium perenne</i>          | 67  | 7.6  | 0.2  | 15.0 |
|          | JUPA2 | <i>Juncus patens</i>           | 67  | 1.5  | 1.0  | 2.0  |
|          | PLLA  | <i>Plantago lanceolata</i>     | 67  | 0.6  | 0.2  | 1.0  |
|          | RUCR  | <i>Rumex crispus</i>           | 67  | 0.2  | 0.2  | 0.2  |
|          | GEDI  | <i>Geranium dissectum</i>      | 67  | 0.2  | 0.2  | 0.2  |
|          | BRHO2 | <i>Bromus hordeaceus</i>       | 67  | 0.2  | 0.2  | 0.2  |
|          | HOLCU | <i>Holcus</i>                  | 33  | 12.0 | 12.0 | 12.0 |
|          | NALE2 | <i>Nassella lepida</i>         | 33  | 6.0  | 6.0  | 6.0  |
|          | LETR5 | <i>Leymus triticoides</i>      | 33  | 1.0  | 1.0  | 1.0  |
|          | CIVU  | <i>Cirsium vulgare</i>         | 33  | 1.0  | 1.0  | 1.0  |
|          | CAOL  | <i>Cardamine oligosperma</i>   | 33  | 1.0  | 1.0  | 1.0  |
|          | SOOL  | <i>Sonchus oleraceus</i>       | 33  | 0.2  | 0.2  | 0.2  |
|          | VISA  | <i>Vicia sativa</i>            | 33  | 0.2  | 0.2  | 0.2  |
|          | STCH  | <i>Stachys chamissonis</i>     | 33  | 0.2  | 0.2  | 0.2  |
|          | RUAC3 | <i>Rumex acetosella</i>        | 33  | 0.2  | 0.2  | 0.2  |
|          | SIBE  | <i>Sisyrinchium bellum</i>     | 33  | 0.2  | 0.2  | 0.2  |
|          | RACA2 | <i>Ranunculus californicus</i> | 33  | 0.2  | 0.2  | 0.2  |
|          | BRDI3 | <i>Bromus diandrus</i>         | 33  | 0.2  | 0.2  | 0.2  |
|          | COMA2 | <i>Conium maculatum</i>        | 33  | 0.2  | 0.2  | 0.2  |
|          | MYDI  | <i>Myosotis discolor</i>       | 33  | 0.2  | 0.2  | 0.2  |
|          | POTR2 | <i>Poa trivialis</i>           | 33  | 0.2  | 0.2  | 0.2  |
|          | AVBA  | <i>Avena barbata</i>           | 33  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## **Carex barbarae Alliance**

### **White-root beds**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Carex barbarae* is dominant or co-dominant in the herbaceous layer with *Asclepias fascicularis*, *Carex praegracilis*, *Epilobium ciliatum*, *Euthamia occidentalis*, *Perideridia kelloggii*, *Senecio minimus*, *Solidago* spp., and *Urtica dioica*. Emergent trees and shrubs may be present at low cover, including trees: *Fraxinus latifolia*, *Platanus racemosa*, *Quercus agrifolia* or *Quercus lobata*, and shrubs: *Cephalanthus occidentalis* or *Rubus* spp.

*Carex barbarae* is tolerant of shade and occurs in winter-deciduous gallery woodlands (Holland 1986). In the Central Valley and central Coast Ranges, *Carex barbarae* occurs regularly as an understory in *Quercus lobata* stands, but it also forms stands without tree canopies. In many areas, *Carex barbarae* is replaced by aggressive non-native woody species, such as *Rubus armeniacus*. In settings where soil moisture is similar to that found in a woodland understory, *Carex barbarae* can be found away from trees. Stands of *C. barbarae* may also remain where trees have been cleared.

### Sonoma County

The single sampled stand of *Carex barbarae* is in the Laguna de Santa Rosa adjacent to isolated *Quercus lobata* trees. It occupies a bottomland swale geomorphically similar to stands sampled in the Great Valley. Clonal green patches in the aerial imagery match the signature of the sample location, suggesting that additional stands may exist a short distance to the east and southeast.

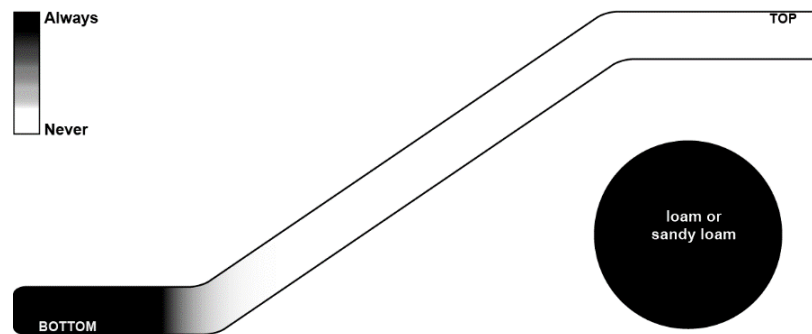
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### **Local Alliance Summary (n = 1)**

**Elevation:** 72 ft

**SCV Global/State Rank:** G2?/S2??

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 100.0        | 100           | –          |
| <b>Herb</b>                          | 99.0         | 99            | 0.5–1      |
| <b>Shrub</b>                         | 5.0          | 5             | 2–5        |
| <b>Regenerating/understory tree*</b> | 1.0          | 1             | 2–5        |
| <b>Hardwood</b>                      | 2.0          | 2             | 5–10       |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 1.0°  | 1°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 3.0%  | 3%    |
| <b>Litter cover</b>      | 94.0% | 94%   |

**Associations within this Alliance:**

*Carex barbarae* Association

**STAND TABLE**

***Carex barbarae* Alliance**

n = 1

| Lifeform                               | Code  | Botanical Name                    | Con | Avg  | Min  | Max  |
|--|-------|-----------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                                   |     |      |      |      |
|  | QULO  | * <i>Quercus lobata</i>           | 100 | 2.0  | 2.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> |       |                                   |     |      |      |      |
|  | QULO  | * <i>Quercus lobata</i>           | 100 | 1.0  | 1.0  | 1.0  |
| <b>Shrub</b>                           |       |                                   |     |      |      |      |
|  | CRDO2 | <i>Crataegus douglasii</i>        | 100 | 4.0  | 4.0  | 4.0  |
|  | RUUR  | <i>Rubus ursinus</i>              | 100 | 1.0  | 1.0  | 1.0  |
|  | BAPI  | <i>Baccharis pilularis</i>        | 100 | 0.2  | 0.2  | 0.2  |
|  | RUAR9 | <i>Rubus armeniacus</i>           | 100 | 0.2  | 0.2  | 0.2  |
|  | TODI  | <i>Toxicodendron diversilobum</i> | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |       |                                   |     |      |      |      |
|  | CABA4 | <i>Carex barbarae</i>             | 100 | 90.0 | 90.0 | 90.0 |
|  | ANOD  | <i>Anthoxanthum odoratum</i>      | 100 | 5.0  | 5.0  | 5.0  |
|  | DEDA  | <i>Deschampsia danthonioides</i>  | 100 | 1.0  | 1.0  | 1.0  |
|  | LOPE  | <i>Lolium perenne</i>             | 100 | 1.0  | 1.0  | 1.0  |
|  | BRMI2 | <i>Briza minor</i>                | 100 | 0.2  | 0.2  | 0.2  |
|  | BRCA5 | <i>Bromus carinatus</i>           | 100 | 0.2  | 0.2  | 0.2  |
|  | CAPY2 | <i>Carduus pycnocephalus</i>      | 100 | 0.2  | 0.2  | 0.2  |
|  | ELAC  | <i>Eleocharis acicularis</i>      | 100 | 0.2  | 0.2  | 0.2  |
|  | ELMA5 | <i>Eleocharis macrostachya</i>    | 100 | 0.2  | 0.2  | 0.2  |
|  | JUBU  | <i>Juncus bufonius</i>            | 100 | 0.2  | 0.2  | 0.2  |
|  | JUPH  | <i>Juncus phaeocephalus</i>       | 100 | 0.2  | 0.2  | 0.2  |
|  | LASE  | <i>Lactuca serriola</i>           | 100 | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.



**STAND TABLE** continued

**Carex barbarae Alliance**

n = 1

| Lifeform | Code  | Botanical Name         | Con | Avg | Min | Max |
|----------|-------|------------------------|-----|-----|-----|-----|
| Herb     | MEPU  | <i>Mentha pulegium</i> | 100 | 0.2 | 0.2 | 0.2 |
|          | RUPU3 | <i>Rumex pulcher</i>   | 100 | 0.2 | 0.2 | 0.2 |

**Carex barbarae Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 100.0        | 100           | –          |
| Herb                          | 99.0         | 99            | 0.5–1      |
| Shrub                         | 5.0          | 5             | 2–5        |
| Regenerating/understory tree* | 1.0          | 1             | 2–5        |
| Hardwood                      | 2.0          | 2             | 5–10       |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)

**Macrotopography:** bottom (1)

**Microtopography:** flat (1)

**Parent material:** mixed alluvium (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1)

|                   | Mean   | Range  |
|-------------------|--------|--------|
| Elevation         | 72 ft. | 72 ft. |
| Slope             | 1.0°   | 1°     |
| Large rock cover  | 0.0%   | 0%     |
| Small rock cover  | 0.0%   | 0%     |
| Bare ground cover | 3.0%   | 3%     |
| Litter cover      | 94.0%  | 94%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0231

**Relevés:** none

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE**

**Carex barbarae Association**

n = 1

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Tree</b>                            |             |                                   |            |            |            |            |
|  | QULO        | * <i>Quercus lobata</i>           | 100        | 2.0        | 2.0        | 2.0        |
| <b>Regenerating or Understory Tree</b> |             |                                   |            |            |            |            |
|  | QULO        | * <i>Quercus lobata</i>           | 100        | 1.0        | 1.0        | 1.0        |
| <b>Shrub</b>                           |             |                                   |            |            |            |            |
|  | CRDO2       | <i>Crataegus douglasii</i>        | 100        | 4.0        | 4.0        | 4.0        |
|  | RUUR        | <i>Rubus ursinus</i>              | 100        | 1.0        | 1.0        | 1.0        |
|  | BAPI        | <i>Baccharis pilularis</i>        | 100        | 0.2        | 0.2        | 0.2        |
|  | RUAR9       | <i>Rubus armeniacus</i>           | 100        | 0.2        | 0.2        | 0.2        |
|  | TODI        | <i>Toxicodendron diversilobum</i> | 100        | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |                                   |            |            |            |            |
|  | CABA4       | <i>Carex barbarae</i>             | 100        | 90.0       | 90.0       | 90.0       |
|  | ANOD        | <i>Anthoxanthum odoratum</i>      | 100        | 5.0        | 5.0        | 5.0        |
|  | DEDA        | <i>Deschampsia danthonioides</i>  | 100        | 1.0        | 1.0        | 1.0        |
|  | LOPE        | <i>Lolium perenne</i>             | 100        | 1.0        | 1.0        | 1.0        |
|  | ELMA5       | <i>Eleocharis macrostachya</i>    | 100        | 0.2        | 0.2        | 0.2        |
|  | BRMI2       | <i>Briza minor</i>                | 100        | 0.2        | 0.2        | 0.2        |
|  | BRCA5       | <i>Bromus carinatus</i>           | 100        | 0.2        | 0.2        | 0.2        |
|  | ELAC        | <i>Eleocharis acicularis</i>      | 100        | 0.2        | 0.2        | 0.2        |
|  | JUBU        | <i>Juncus bufonius</i>            | 100        | 0.2        | 0.2        | 0.2        |
|  | JUPH        | <i>Juncus phaeocephalus</i>       | 100        | 0.2        | 0.2        | 0.2        |
|  | MEPU        | <i>Mentha pulegium</i>            | 100        | 0.2        | 0.2        | 0.2        |
|  | RUPU3       | <i>Rumex pulcher</i>              | 100        | 0.2        | 0.2        | 0.2        |
|  | LASE        | <i>Lactuca serriola</i>           | 100        | 0.2        | 0.2        | 0.2        |
|  | CAPY2       | <i>Carduus pycnocephalus</i>      | 100        | 0.2        | 0.2        | 0.2        |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Carex nudata Alliance**  
**Torrent sedge patches**

Statewide (Sawyer et al. 2009)

*Carex nudata* is dominant in the herbaceous layer with *Artemisia douglasiana*, *Artemisia ludoviciana*, *Carex praegracilis*, *Carex senta*, *Carex serratodens*, *Cyperus eragrostis*, *Darmera peltata*, *Datisca glomerata*, *Equisetum arvense*, *Equisetum hyemale*, *Mimulus guttatus*, *Paspalum dilatatum*, *Poa pratensis*, and *Stachys stricta*. Emergent riparian trees may be present at low cover, especially *Alnus* spp., *Populus* spp. or *Salix* spp.

The *Carex nudata* Alliance occurs along perennially and seasonally flooded streams in California. Flooding from either winter or spring snowmelt creates regular mechanical impact to boulder and cobble beds creating the characteristic substrate associated with this alliance. Highly scoured reaches of streams flowing through bedrock do not typically harbor the sedge. *Carex senta*, another tufted streambed species, grows in situations similar to *Carex nudata*; it might warrant inclusion in this alliance with further investigation. *Carex nudata* stands are frequently associated with stands of the *Alnus rhombifolia* Alliance and *C. nudata* may occur as an understory beneath open *A. rhombifolia* stands, depending upon flooding frequency and intensity.

Sonoma County

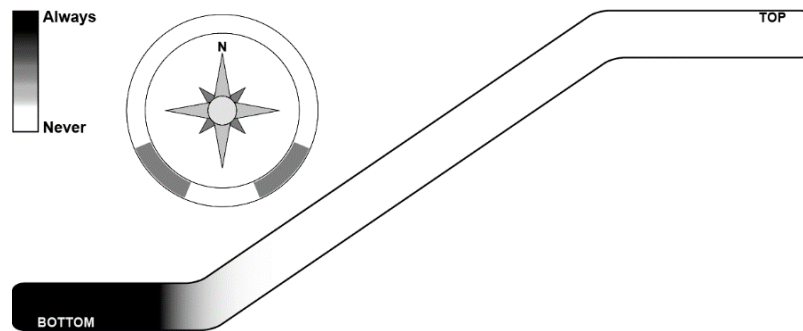
Two widely separated *Carex nudata* stands were sampled along large permanent streams in the county. Their settings and species composition are similar to stands described in the Sierra Nevada foothills (Potter 2005).

**Local Alliance Summary (n = 2)**

**Elevation:** 285–551 ft, mean 418 ft

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 48.5         | 17–80         | –          |
| Herb             | 47.5         | 16–79         | 0.5–2      |
| Shrub            | 0.0          | 0–0           | –          |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 1.0          | 1–1           | 0.5–1      |
| <b>Hardwood</b>                      | 1.0          | 0–2           | 10–15      |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 2.0°  | 2–2°   |
| <b>Large rock cover</b>  | 6.0%  | 0–12%  |
| <b>Small rock cover</b>  | 62.0% | 35–89% |
| <b>Bare ground cover</b> | 6.5%  | 5–8%   |
| <b>Litter cover</b>      | 1.5%  | 1–2%   |

**Associations within this Alliance:**

*Carex nudata* Association

**STAND TABLE**

***Carex nudata* Alliance**

n = 2

| Lifeform                               | Code  | Botanical Name               | Con | Avg  | Min  | Max  |
|--|-------|------------------------------|-----|------|------|------|
| <b>Tree</b>                            |       |                              |     |      |      |      |
|  | ALRH2 | * <i>Alnus rhombifolia</i>   | 50  | 2.0  | 2.0  | 2.0  |
|  | FRLA  | <i>Fraxinus latifolia</i>    | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |       |                              |     |      |      |      |
|  | ALRH2 | * <i>Alnus rhombifolia</i>   | 100 | 0.7  | 0.2  | 1.2  |
|  | SALA3 | <i>Salix laevigata</i>       | 50  | 1.0  | 1.0  | 1.0  |
| <b>Herb</b>                            |       |                              |     |      |      |      |
|  | CANU5 | <i>Carex nudata</i>          | 100 | 41.5 | 12.0 | 71.0 |
|  | EUOC4 | <i>Euthamia occidentalis</i> | 50  | 3.0  | 3.0  | 3.0  |
|  | ARDO3 | <i>Artemisia douglasiana</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | MIMUL | <i>Mimulus</i>               | 50  | 0.2  | 0.2  | 0.2  |
|  | PLLA  | <i>Plantago lanceolata</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | RUMEX | <i>Rumex</i>                 | 50  | 0.2  | 0.2  | 0.2  |
|  | TYLA  | <i>Typha latifolia</i>       | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Carex nudata* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 48.5         | 17–80         | –          |
| <b>Herb</b>             | 47.5         | 16–79         | 0.5–2      |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 1.0          | 1–1           | 0.5–1      |
| <b>Hardwood</b>                      | 1.0          | 0–2           | 10–15      |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (1)  
**Macrotopography:** bottom (2)  
**Microtopography:** concave (1), flat (1)  
**Parent material:** sandstone (1), sedimentary (1)  
**Soil texture:** no data  
**Slope steepness:** gentle/1-5° (2)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 418 ft. | 285–551 ft. |
| <b>Slope</b>             | 2.0°    | 2–2°        |
| <b>Large rock cover</b>  | 6.0%    | 0–12%       |
| <b>Small rock cover</b>  | 62.0%   | 35–89%      |
| <b>Bare ground cover</b> | 6.5%    | 5–8%        |
| <b>Litter cover</b>      | 1.5%    | 1–2%        |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0364  
**Relevés:** SONO0928

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

**Carex nudata Association**

n = 2

| Lifeform                               | Code  | Botanical Name               | Con | Avg  | Min  | Max  |
|--|-------|------------------------------|-----|------|------|------|
| <b>Tree</b>                            | ALRH2 | * <i>Alnus rhombifolia</i>   | 50  | 2.0  | 2.0  | 2.0  |
|  | FRLA  | <i>Fraxinus latifolia</i>    | 50  | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> | ALRH2 | * <i>Alnus rhombifolia</i>   | 100 | 0.7  | 0.2  | 1.2  |
|  | SALA3 | <i>Salix laevigata</i>       | 50  | 1.0  | 1.0  | 1.0  |
| <b>Herb</b>                            | CANU5 | <i>Carex nudata</i>          | 100 | 41.5 | 12.0 | 71.0 |
|  | EUOC4 | <i>Euthamia occidentalis</i> | 50  | 3.0  | 3.0  | 3.0  |
|  | TYLA  | <i>Typha latifolia</i>       | 50  | 0.2  | 0.2  | 0.2  |
|  | PLLA  | <i>Plantago lanceolata</i>   | 50  | 0.2  | 0.2  | 0.2  |
|  | RUMEX | <i>Rumex</i>                 | 50  | 0.2  | 0.2  | 0.2  |
|  | ARDO3 | <i>Artemisia douglasiana</i> | 50  | 0.2  | 0.2  | 0.2  |
|  | MIMUL | <i>Mimulus</i>               | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Carex obnupta* Alliance**  
**Slough sedge swards**

Statewide (Sawyer et al. 2009)

*Carex obnupta* is dominant or co-dominant in the herbaceous layer with *Argentina egedii*, *Athyrium filix-femina*, *Cynosurus echinatus*, *Eleocharis macrostachya*, *Holcus lanatus*, *Juncus lescurii*, *Juncus patens*, *Luzula comosa*, *Lysichiton americanus*, *Sidalcea malviflora*, and *Symphyotrichum chilense*. Emergent trees and shrubs may be present at low cover, including trees: *Alnus rubra*, and shrubs: *Baccharis pilularis*, *Morella californica*, *Rubus* spp., *Salix hookeriana*, and *Salix lasiolepis*.

*Carex obnupta* stands occur in moist to saturated swales, edges of coastal lagoons, tidally influenced wetlands, and other areas where fresh and brackish water meet. The plants may occur under shrub or forest canopies or they can form dense, continuous stands that may be found in the open. This species becomes an understory plant in wet but more sheltered settings, which favor tree development. *Carex obnupta* may form understories in the *Alnus rubra*, *Morella californica*, *Picea sitchensis*, *Pinus contorta* ssp. *contorta*, and *Salix hookeriana* Alliances. Trees and shrubs do not typically colonize the more coastal areas due to the exposure to strong salt-laden winds; stands of *Carex obnupta* occur in this environment. The open stands, which lack an overstory or have only a few emergent shrubs or trees, are included in this alliance.

Sonoma County

All ten samples of this alliance occur within 3 km of the coast, many in swales and depressions located on coastal terraces or on bluffs. Along with *Scirpus microcarpus*, *Juncus (effusus, patens)*, and *Calamagrostis nutkaensis* Alliance stands, these stands commonly form mosaics of wetter herbaceous vegetation adjacent to the coast. *Carex obnupta* stands are more permanently moist than *Juncus* or *Calamagrostis* stands, but not as permanently saturated as *Scirpus microcarpus* stands.

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**Local Alliance Summary (n = 10)**

**Elevation:** 46–355 ft, mean 150 ft

**SCV Global/State Rank:** G4/S3<sup>1</sup>

**Noteworthy Taxa**

*Agrostis blasdalei*

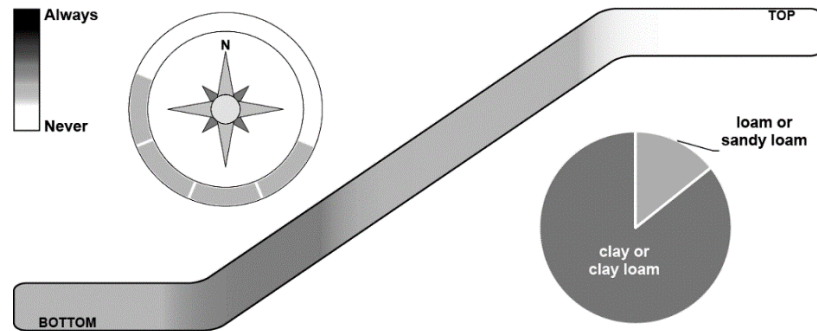
CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 69.3         | 25–100        | –          |
| <b>Herb</b>                          | 68.6         | 18–98         | 0.5–2      |
| <b>Shrub</b>                         | 16.3         | 1–70          | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 3.2°  | 0–8°   |
| <b>Large rock cover</b>  | 1.0%  | 0–9%   |
| <b>Small rock cover</b>  | 0.0%  | 0–0%   |
| <b>Bare ground cover</b> | 2.8%  | 0–6%   |
| <b>Litter cover</b>      | 81.4% | 50–92% |

**Associations within this Alliance:**

*Carex obnupta* Association

**STAND TABLE**

***Carex obnupta* Alliance**

n = 10

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> | RUUR   | <i>Rubus ursinus</i>                             | 90  | 14.2 | 1.0  | 68.0 |
|              | BAPI   | <i>Baccharis pilularis</i>                       | 40  | 4.3  | 1.0  | 10.0 |
|              | VIAMA3 | <i>Vicia americana</i> ssp. <i>americana</i>     | 20  | 0.6  | 0.2  | 1.0  |
| <b>Herb</b>  | CAOB3  | <i>Carex obnupta</i>                             | 90  | 72.2 | 18.0 | 88.0 |
|              | GAAP2  | <i>Galium aparine</i>                            | 90  | 0.2  | 0.2  | 0.2  |
|              | RUAC3  | <i>Rumex acetosella</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|              | HOLA   | <i>Holcus lanatus</i>                            | 40  | 4.1  | 0.2  | 8.0  |
|              | POMU   | <i>Polystichum munitum</i>                       | 40  | 2.3  | 0.2  | 5.0  |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 40  | 1.6  | 0.2  | 4.0  |
|              | CANU   | <i>Calamagrostis nutkaensis</i>                  | 30  | 3.0  | 2.0  | 4.0  |
|              | IRDO   | <i>Iris douglasiana</i>                          | 30  | 0.5  | 0.2  | 1.0  |

**STAND TABLE** continued

**Carex obnupta Alliance**

n = 10

| Lifeform | Code   | Botanical Name                                 | Con | Avg | Min | Max  |
|----------|--------|--|-----|-----|-----|------|
| Herb     | CAREX  | <i>Carex</i>                                   | 20  | 8.6 | 0.2 | 17.0 |
|          | STCH   | <i>Stachys chamissonis</i>                     | 20  | 6.5 | 4.0 | 9.0  |
|          | ACNO7  | <i>Acaena novae-zelandiae</i>                  | 20  | 5.0 | 3.0 | 7.0  |
|          | EQAR   | <i>Equisetum arvense</i>                       | 20  | 4.1 | 0.2 | 8.0  |
|          | HEMA80 | <i>Heracleum maximum</i>                       | 20  | 2.1 | 0.2 | 4.0  |
|          | ERMI8  | <i>Erechtites minimus</i>                      | 20  | 1.6 | 0.2 | 3.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                    | 20  | 1.1 | 0.2 | 2.0  |
|          | CALAM  | <i>Calamagrostis</i>                           | 20  | 1.0 | 1.0 | 1.0  |
|          | MARAH  | <i>Marah</i>                                   | 20  | 0.6 | 0.2 | 1.0  |
|          | AREG   | <i>Argentina egedii</i>                        | 20  | 0.2 | 0.2 | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>                         | 20  | 0.2 | 0.2 | 0.2  |
|          | JUAR2  | <i>Juncus arcticus</i>                         | 20  | 0.2 | 0.2 | 0.2  |
|          | STBOS  | <i>Stellaria borealis</i> ssp. <i>sitchana</i> | 20  | 0.2 | 0.2 | 0.2  |
|          | GEDI   | <i>Geranium dissectum</i>                      | 20  | 0.2 | 0.1 | 0.2  |

**Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

**Carex obnupta Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) and Coastal Hills-Santa Rosa Plain/263Aj (6) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 69.3         | 25–100        | –          |
| <b>Herb</b>                          | 68.6         | 18–98         | 0.5–2      |
| <b>Shrub</b>                         | 16.3         | 1–70          | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (2), SW (7)

**Macrotopography:** bottom (1), lower 1/3 of slope (5), middle 1/3 of slope (2), upper 1/3 of slope (1)

**Microtopography:** concave (4), convex (1), flat (4), undulating (1)

**Parent material:** Franciscan melange (2), metasedimentary (2), mixed sedimentary (1), sedimentary (5)

**Soil texture:** clay or clay loam (6), loam or sandy loam (1)

**Slope steepness:** flat/0° (1), gentle/1-5° (6), moderate/6-25° (3)



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|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 150 ft. | 46–355 ft. |
| Slope             | 3.2°    | 0–8°       |
| Large rock cover  | 1.0%    | 0–9%       |
| Small rock cover  | 0.0%    | 0–0%       |
| Bare ground cover | 2.8%    | 0–6%       |
| Litter cover      | 81.4%   | 50–92%     |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** SONO0034, SONO0226

**Relevés:** HEAD0115, HEAD0213, HEAD0214, HEAD0253, SONO0038, SONO0458, SONO0460, SONO0462

**SCV Global/State Rank:** G4/S3<sup>1</sup>

**STAND TABLE**

**Carex obnupta Association**

n = 10

| Lifeform | Code                      | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|---------------------------|--|-----|------|------|------|
| Shrub    | RUUR                      | <i>Rubus ursinus</i>                             | 90  | 14.2 | 1.0  | 68.0 |
|          | BAPI                      | <i>Baccharis pilularis</i>                       | 40  | 4.3  | 1.0  | 10.0 |
|          | VIAMA3                    | <i>Vicia americana</i> ssp. <i>americana</i>     | 20  | 0.6  | 0.2  | 1.0  |
| Herb     | CAOB3                     | <i>Carex obnupta</i>                             | 90  | 72.2 | 18.0 | 88.0 |
|          | GAAP2                     | <i>Galium aparine</i>                            | 90  | 0.2  | 0.2  | 0.2  |
|          | RUAC3                     | <i>Rumex acetosella</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|          | HOLA                      | <i>Holcus lanatus</i>                            | 40  | 4.1  | 0.2  | 8.0  |
|          | POMU                      | <i>Polystichum munitum</i>                       | 40  | 2.3  | 0.2  | 5.0  |
|          | PTAQP2                    | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 40  | 1.6  | 0.2  | 4.0  |
|          | CANU                      | <i>Calamagrostis nutkaensis</i>                  | 30  | 3.0  | 2.0  | 4.0  |
|          | IRDO                      | <i>Iris douglasiana</i>                          | 30  | 0.5  | 0.2  | 1.0  |
|          | CAREX                     | <i>Carex</i>                                     | 20  | 8.6  | 0.2  | 17.0 |
|          | STCH                      | <i>Stachys chamissonis</i>                       | 20  | 6.5  | 4.0  | 9.0  |
|          | ACNO7                     | <i>Acaena novae-zelandiae</i>                    | 20  | 5.0  | 3.0  | 7.0  |
|          | EQAR                      | <i>Equisetum arvense</i>                         | 20  | 4.1  | 0.2  | 8.0  |
|          | HEMA80                    | <i>Heracleum maximum</i>                         | 20  | 2.1  | 0.2  | 4.0  |
|          | ERMI8                     | <i>Erechtites minimus</i>                        | 20  | 1.6  | 0.2  | 3.0  |
|          | ACMI2                     | <i>Achillea millefolium</i>                      | 20  | 1.1  | 0.2  | 2.0  |
|          | CALAM                     | <i>Calamagrostis</i>                             | 20  | 1.0  | 1.0  | 1.0  |
|          | MARAH                     | <i>Marah</i>                                     | 20  | 0.6  | 0.2  | 1.0  |
|          | CIVU                      | <i>Cirsium vulgare</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|          | STBOS                     | <i>Stellaria borealis</i> ssp. <i>sitchana</i>   | 20  | 0.2  | 0.2  | 0.2  |
|          | JUAR2                     | <i>Juncus arcticus</i>                           | 20  | 0.2  | 0.2  | 0.2  |
| AREG     | <i>Argentina egedii</i>   | 20   | 0.2 | 0.2  | 0.2  |      |
| GEDI     | <i>Geranium dissectum</i> | 20   | 0.2 | 0.1  | 0.2  |      |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

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## ***Carex serratodens* Provisional Alliance**

### **Twotooth sedge seeps**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Carex serratodens* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Asclepias fascicularis*, *Deschampsia danthonioides*, *Hordeum brachyantherum*, *Juncus arcticus*, *Juncus bufonius*, *Juncus occidentalis*, *Lotus purshianus*, *Mimulus guttatus*, and *Sisyrinchium bellum*. Emergent shrubs may be present at low cover, including *Baccharis pilularis* or *Frangula californica*.

*Carex serratodens* stands appear on wet-to-moist serpentine substrates (Alexander et al. 2007). They occur in gently sloping seeps, broad meadows, and narrow riparian stringers with a mixture of serpentine-tolerant species, including endemics.

### Sonoma County

All stands sampled in the county occur on ultramafic (serpentine) substrates and either exist on seeps, springs, or slump ponds associated with landslides. Depending upon the size of the stand, adjacent vegetation may be other wetland or meadow alliances such as *Juncus (effusus, patens)* or *Carex (pansa, praegracilis)*, or serpentine-tolerant upland grassland or herbaceous types such as *Nassella* spp. – *Melica* spp., *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys*, or *Festuca idahoensis*.

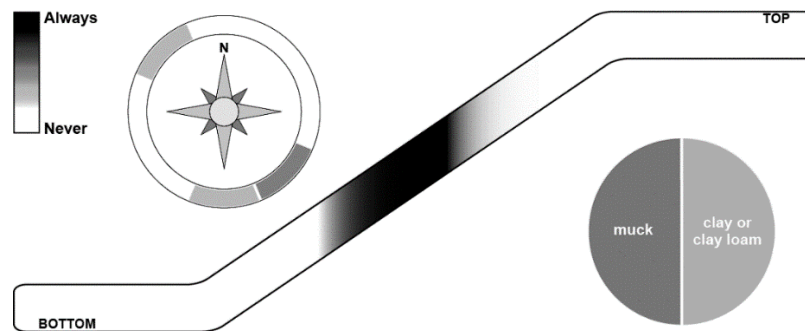
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### **Local Alliance Summary (n = 4)**

**Elevation:** 799–1306 ft, mean 1058 ft

**SCV Global/State Rank:** G3/S3?<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 43.0         | 29–71         | –          |
| <b>Herb</b>                          | 42.8         | 29–70         | <0.5–1     |
| <b>Shrub</b>                         | 0.3          | 0–1           | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 7.0°  | 2–12°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.0%  | 0–0%   |
| <b>Bare ground cover</b> | 22.3% | 2–61%  |
| <b>Litter cover</b>      | 71.7% | 35–95% |

**Associations within this Alliance:**

*Carex serratodens* Provisional Association

**STAND TABLE**

***Carex serratodens* Provisional Alliance**

n = 4

| Lifeform     | Code  | Botanical Name                | Con | Avg  | Min | Max  |
|--------------|-------|-------------------------------|-----|------|-----|------|
| <b>Shrub</b> |       |                               |     |      |     |      |
|              | BAPI  | <i>Baccharis pilularis</i>    | 25  | 1.0  | 1.0 | 1.0  |
| <b>Herb</b>  |       |                               |     |      |     |      |
|              | CASE2 | <i>Carex serratodens</i>      | 100 | 36.0 | 4.0 | 70.0 |
|              | LETR5 | <i>Leymus triticoides</i>     | 100 | 1.9  | 0.2 | 7.0  |
|              | JUAR2 | <i>Juncus arcticus</i>        | 50  | 4.6  | 0.2 | 9.0  |
|              | RUCR  | <i>Rumex crispus</i>          | 50  | 0.2  | 0.2 | 0.2  |
|              | AGHE2 | <i>Agoseris heterophylla</i>  | 25  | 7.0  | 7.0 | 7.0  |
|              | CAPR5 | <i>Carex praegracilis</i>     | 25  | 1.0  | 1.0 | 1.0  |
|              | MEIN2 | <i>Melilotus indicus</i>      | 25  | 1.0  | 1.0 | 1.0  |
|              | ANAGA | <i>Anagallis</i>              | 25  | 0.2  | 0.2 | 0.2  |
|              | AVBA  | <i>Avena barbata</i>          | 25  | 0.2  | 0.2 | 0.2  |
|              | BRMA  | <i>Briza maxima</i>           | 25  | 0.2  | 0.2 | 0.2  |
|              | CIVU  | <i>Cirsium vulgare</i>        | 25  | 0.2  | 0.2 | 0.2  |
|              | ELGL  | <i>Elymus glaucus</i>         | 25  | 0.2  | 0.2 | 0.2  |
|              | ELMU3 | <i>Elymus multisetus</i>      | 25  | 0.2  | 0.2 | 0.2  |
|              | EPILO | <i>Epilobium</i>              | 25  | 0.2  | 0.2 | 0.2  |
|              | FEID  | <i>Festuca idahoensis</i>     | 25  | 0.2  | 0.2 | 0.2  |
|              | GAPA5 | <i>Galium parisiense</i>      | 25  | 0.2  | 0.2 | 0.2  |
|              | HOBR2 | <i>Hordeum brachyantherum</i> | 25  | 0.2  | 0.2 | 0.2  |
|              | LASA  | <i>Lactuca saligna</i>        | 25  | 0.2  | 0.2 | 0.2  |
|              | SIBE  | <i>Sisyrinchium bellum</i>    | 25  | 0.2  | 0.2 | 0.2  |

## Carex serratodens Provisional Association

### Distribution in Study Area

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

### Summary of Vegetation Data

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 43.0         | 29–71         | –          |
| <b>Herb</b>                          | 42.8         | 29–70         | <0.5–1     |
| <b>Shrub</b>                         | 0.3          | 0–1           | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

### Summary of Environmental Data

**Aspect:** NW (1), SE (2), SW (1)

**Macrotopography:** middle 1/3 of slope (4)

**Microtopography:** concave (2), flat (1), undulating (1)

**Parent material:** Franciscan melange (2), serpentine (1), ultramafic (1)

**Soil texture:** clay or clay loam (2), muck (2)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (1)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1058 ft. | 799–1306 ft. |
| <b>Slope</b>             | 7.0°     | 2–12°        |
| <b>Large rock cover</b>  | 0.0%     | 0–0%         |
| <b>Small rock cover</b>  | 0.0%     | 0–0%         |
| <b>Bare ground cover</b> | 22.3%    | 2–61%        |
| <b>Litter cover</b>      | 71.7%    | 35–95%       |

### Samples Used to Describe Association (n=4)

**Rapid Assessments:** none

**Relevés:** SONO0354, SONO0477, SONO0478, SONO0543

**SCV Global/State Rank:** G2G3?/S2S3?<sup>1</sup>

### STAND TABLE

#### Carex serratodens Provisional Association

n = 4

| Lifeform | Code  | Botanical Name               | Con | Avg  | Min | Max  |
|----------|-------|------------------------------|-----|------|-----|------|
| Shrub    | BAPI  | <i>Baccharis pilularis</i>   | 25  | 1.0  | 1.0 | 1.0  |
|          |       |                              |     |      |     |      |
| Herb     | CASE2 | <i>Carex serratodens</i>     | 100 | 36.0 | 4.0 | 70.0 |
|          | LETR5 | <i>Leymus triticoides</i>    | 100 | 1.9  | 0.2 | 7.0  |
|          | JUAR2 | <i>Juncus arcticus</i>       | 50  | 4.6  | 0.2 | 9.0  |
|          | RUCR  | <i>Rumex crispus</i>         | 50  | 0.2  | 0.2 | 0.2  |
|          | AGHE2 | <i>Agoseris heterophylla</i> | 25  | 7.0  | 7.0 | 7.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

**Carex serratodens Provisional Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>         | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|-------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                               |            |            |            |            |
|                 | CAPR5       | <i>Carex praegracilis</i>     | 25         | 1.0        | 1.0        | 1.0        |
|                 | MEIN2       | <i>Melilotus indicus</i>      | 25         | 1.0        | 1.0        | 1.0        |
|                 | EPILO       | <i>Epilobium</i>              | 25         | 0.2        | 0.2        | 0.2        |
|                 | SIBE        | <i>Sisyrinchium bellum</i>    | 25         | 0.2        | 0.2        | 0.2        |
|                 | LASA        | <i>Lactuca saligna</i>        | 25         | 0.2        | 0.2        | 0.2        |
|                 | HOBR2       | <i>Hordeum brachyantherum</i> | 25         | 0.2        | 0.2        | 0.2        |
|                 | GAPA5       | <i>Galium parisiense</i>      | 25         | 0.2        | 0.2        | 0.2        |
|                 | ELMU3       | <i>Elymus multisetus</i>      | 25         | 0.2        | 0.2        | 0.2        |
|                 | ELGL        | <i>Elymus glaucus</i>         | 25         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>        | 25         | 0.2        | 0.2        | 0.2        |
|                 | BRMA        | <i>Briza maxima</i>           | 25         | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>          | 25         | 0.2        | 0.2        | 0.2        |
|                 | ANAGA       | <i>Anagallis</i>              | 25         | 0.2        | 0.2        | 0.2        |
|                 | FEID        | <i>Festuca idahoensis</i>     | 25         | 0.2        | 0.2        | 0.2        |

***Centaurea (solstitialis, melitensis)* Semi-Natural Alliance**  
**Yellow star-thistle fields**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Centaurea melitensis*, *Centaurea solstitialis*, or another star-thistle species is dominant or co-dominant with other non-natives in the herbaceous layer. Emergent trees and shrubs may be present at low cover.

*Centaurea* species have invaded significant areas throughout California. *Centaurea solstitialis* uses deep soil moisture reserves earlier in the growing season than do natives such as *Nassella pulchra* and *Quercus douglasii*; as a result, the natives experience drought conditions even in years with normal rainfall. In contrast, less competition exists with the shallow-rooted annuals that mature early in the growing season (D. Dudley 2000, Gerlach et al. 1998). Many stands are rife with other non-natives, but many native plant species are able to grow in star-thistle stands as well.

Sonoma County

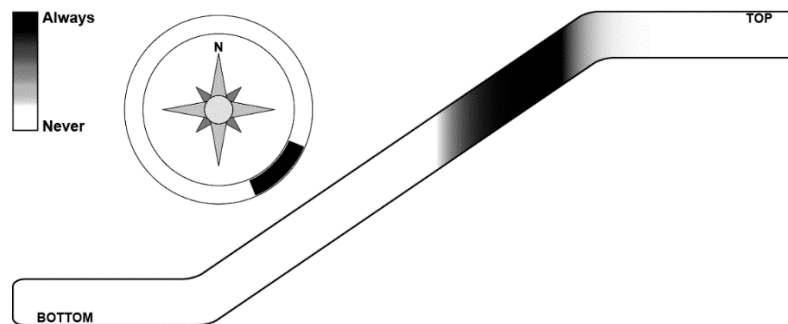
*Centaurea* stands are not well inventoried, due to lack of interest and/or intolerance of prickles. The single sampled stand is in a typically ruderal setting in a low-lying field with a long history of sheep grazing. The build-up of *Centaurea* thatch is easy to discern in the aerial imagery from the summer of 2013; it contrasts with the paler surrounding slopes covered largely with a mix of native grasses like *Nassella pulchra* and non-native *Bromus* and *Avena*.

**Local Alliance Summary (n = 1)**

**Elevation:** 324 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 58.0         | 58            | –          |
| <b>Herb</b>                          | 58.0         | 58            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 14.0° | 14°   |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 0.0%  | 0%    |
| Bare ground cover | 1.0%  | 1%    |
| Litter cover      | 97.0% | 97%   |

**Associations within this Alliance:**

*Centaurea solstitialis* Semi-Natural Association

**STAND TABLE**

***Centaurea (solstitialis, melitensis)* Semi-Natural Alliance**

n = 1

| Lifeform | Code  | Botanical Name                  | Con | Avg  | Min  | Max  |
|----------|-------|---------------------------------|-----|------|------|------|
| Herb     |       |                                 |     |      |      |      |
|          | BROMU | <i>Bromus</i>                   | 100 | 38.0 | 38.0 | 38.0 |
|          | CESO3 | <i>Centaurea solstitialis</i>   | 100 | 12.0 | 12.0 | 12.0 |
|          | BRHO2 | <i>Bromus hordeaceus</i>        | 100 | 6.0  | 6.0  | 6.0  |
|          | VUBR  | <i>Vulpia bromoides</i>         | 100 | 2.0  | 2.0  | 2.0  |
|          | CHPO3 | <i>Chlorogalum pomeridianum</i> | 100 | 1.0  | 1.0  | 1.0  |
|          | ERBO  | <i>Erodium botrys</i>           | 100 | 0.2  | 0.2  | 0.2  |
|          | ERCI6 | <i>Erodium cicutarium</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | ESCA2 | <i>Eschscholzia californica</i> | 100 | 0.2  | 0.2  | 0.2  |
|          | GEDI  | <i>Geranium dissectum</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | HYGL2 | <i>Hypochaeris glabra</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | RASA2 | <i>Raphanus sativus</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | RUMEX | <i>Rumex</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|          | SIDI  | <i>Sidalcea diploscypha</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | SIMA3 | <i>Silybum marianum</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | VISA  | <i>Vicia sativa</i>             | 100 | 0.2  | 0.2  | 0.2  |
|          | VIPE3 | <i>Viola pedunculata</i>        | 100 | 0.2  | 0.2  | 0.2  |

***Centaurea solstitialis* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 58.0         | 58            | –          |
| Herb                          | 58.0         | 58            | <0.5–0.5   |
| Shrub                         | 0.0          | 0             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings



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**Summary of Environmental Data**

**Aspect:** SE (1)  
**Macrotopography:** upper 1/3 of slope (1)  
**Microtopography:** concave (1)  
**Parent material:** sandstone (1)  
**Soil texture:** no data  
**Slope steepness:** moderate/6-25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 324 ft. | 324 ft. |
| <b>Slope</b>             | 14.0°   | 14°     |
| <b>Large rock cover</b>  | 0.0%    | 0%      |
| <b>Small rock cover</b>  | 0.0%    | 0%      |
| <b>Bare ground cover</b> | 1.0%    | 1%      |
| <b>Litter cover</b>      | 97.0%   | 97%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO0668

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Centaurea solstitialis* Semi-Natural Association**

n = 1

| Lifeform | Code  | Botanical Name                  | Con | Avg  | Min  | Max  |
|----------|-------|---------------------------------|-----|------|------|------|
| Herb     | BROMU | <i>Bromus</i>                   | 100 | 38.0 | 38.0 | 38.0 |
|          | CESO3 | <i>Centaurea solstitialis</i>   | 100 | 12.0 | 12.0 | 12.0 |
|          | BRHO2 | <i>Bromus hordeaceus</i>        | 100 | 6.0  | 6.0  | 6.0  |
|          | VUBR  | <i>Vulpia bromoides</i>         | 100 | 2.0  | 2.0  | 2.0  |
|          | CHPO3 | <i>Chlorogalum pomeridianum</i> | 100 | 1.0  | 1.0  | 1.0  |
|          | RUMEX | <i>Rumex</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|          | VIPE3 | <i>Viola pedunculata</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | VISA  | <i>Vicia sativa</i>             | 100 | 0.2  | 0.2  | 0.2  |
|          | SIMA3 | <i>Silybum marianum</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | RASA2 | <i>Raphanus sativus</i>         | 100 | 0.2  | 0.2  | 0.2  |
|          | HYGL2 | <i>Hypochaeris glabra</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | GEDI  | <i>Geranium dissectum</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | ESCA2 | <i>Eschscholzia californica</i> | 100 | 0.2  | 0.2  | 0.2  |
|          | ERCI6 | <i>Erodium cicutarium</i>       | 100 | 0.2  | 0.2  | 0.2  |
|          | ERBO  | <i>Erodium botrys</i>           | 100 | 0.2  | 0.2  | 0.2  |
|          | SIDI  | <i>Sidalcea diploscypha</i>     | 100 | 0.2  | 0.2  | 0.2  |

***Ceratophyllum demersum* Provisional Alliance**  
**Raccoon's tail mats**

Statewide

*Ceratophyllum demersum* dominates or co-dominates with *Myriophyllum* spp., *Polygonum amphibium*, and algae. *Lemna* spp. and *Azolla filiculoides* may be present.

Plants in this alliance are wholly aquatic and consist of mostly submerged aquatic species. They occupy small lakes and ponds throughout the state from sea level to over 1800 m. The most extensive stands known so far are in the Sacramento–San Joaquin River Delta.

Sonoma County

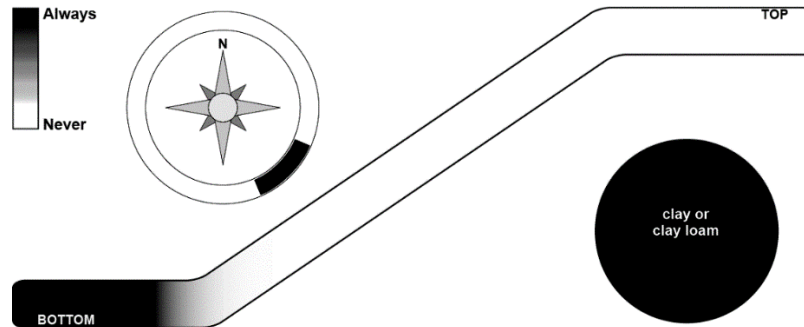
A single sample was taken from a man-made pond below cooling towers at the Geysers Geothermal facility. It was dominated by *Ceratophyllum demersum*.

**Local Alliance Summary (n = 1)**

**Elevation:** 3154 ft

**SCV Global/State Rank:** G5/S3<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.0         | 55            | –          |
| <b>Herb</b>                          | 55.0         | 55            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 0.0°  | 0°    |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 5.0%  | 5%    |
| Bare ground cover | 5.0%  | 5%    |
| Litter cover      | 30.0% | 30%   |

**Associations within this Alliance:**

*Ceratophyllum demersum* Western Provisional Association

**STAND TABLE**

***Ceratophyllum demersum* Provisional Alliance**

n = 1

| Lifeform            | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|---------------------|-------|--|-----|------|------|------|
| <b>Herb</b>         |       |  |     |      |      |      |
|                     | CEDE4 | <i>Ceratophyllum demersum</i>                  | 100 | 35.0 | 35.0 | 35.0 |
|                     | POAME | <i>Polygonum amphibium</i> var. <i>emersum</i> | 100 | 14.0 | 14.0 | 14.0 |
|                     | MYAQ2 | <i>Myriophyllum aquaticum</i>                  | 100 | 4.0  | 4.0  | 4.0  |
|                     | CRSC  | <i>Crypsis schoenoides</i>                     | 100 | 0.2  | 0.2  | 0.2  |
|                     | EUPHO | <i>Euphorbia</i>                               | 100 | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |       |  |     |      |      |      |
|                     | 2ALGA | Alga   | 100 | 8.0  | 8.0  | 8.0  |

***Ceratophyllum demersum* Western Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 55.0         | 55            | –          |
| Herb                          | 55.0         | 55            | <0.5–0.5   |
| Shrub                         | 0.0          | 0             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1)

**Macrotopography:** bottom (1)

**Microtopography:** concave (1)

**Parent material:** Franciscan melange (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (1)

|           | Mean     | Range    |
|-----------|----------|----------|
| Elevation | 3154 ft. | 3154 ft. |
| Slope     | 0.0°     | 0°       |

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|                   | Mean  | Range |
|-------------------|-------|-------|
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 5.0%  | 5%    |
| Bare ground cover | 5.0%  | 5%    |
| Litter cover      | 30.0% | 30%   |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0128

**Relevés:** none

**SCV Global/State Rank:** G5/S3<sup>1</sup>

**STAND TABLE**

***Ceratophyllum demersum* Western Provisional Association**

n = 1

| Lifeform            | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|---------------------|-------|--|-----|------|------|------|
| <b>Herb</b>         |       |  |     |      |      |      |
|                     | CEDE4 | <i>Ceratophyllum demersum</i>                  | 100 | 35.0 | 35.0 | 35.0 |
|                     | POAME | <i>Polygonum amphibium</i> var. <i>emersum</i> | 100 | 14.0 | 14.0 | 14.0 |
|                     | MYAQ2 | <i>Myriophyllum aquaticum</i>                  | 100 | 4.0  | 4.0  | 4.0  |
|                     | CRSC  | <i>Crypsis schoenoides</i>                     | 100 | 0.2  | 0.2  | 0.2  |
|                     | EUPHO | <i>Euphorbia</i>                               | 100 | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |       |  |     |      |      |      |
|                     | 2ALGA | Alga   | 100 | 8.0  | 8.0  | 8.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Cynosurus echinatus* Semi-Natural Alliance**

### **Annual dogtail grasslands**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Cynosurus echinatus* is dominant or co-dominant with other non-natives in the herbaceous layer and native herbs are absent or present with insignificant cover. Emergent trees and shrubs may be present at low cover.

*Cynosurus echinatus* stands occur on warm exposures in areas where the annual precipitation tends to be > 8 cm and the temperature is relatively low compared to many other annual grass types. *Cynosurus echinatus* is also common in the understory in low-elevation hardwood and conifer woodlands in the mountains of northern California (Klein et al. 2007). Most information about this type comes from the northern Coast Ranges.

#### Sonoma County

All stands sampled in the Sonoma County occur within about 8 km of the coast. Farther north in the Inner North Coast Ranges (Jimerson et al. 2000) and in the northern Sierra Nevada Foothills (Klein et al. 2007) stands occur much farther inland and at higher elevations. Although *Cynosurus echinatus* stands tend to be close to the coast, they are commonly found on upper slopes and many may be above the average temperature inversion layer (mean elevation ca. 800 ft).

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#### **Local Alliance Summary (n = 15)**

**Elevation:** 138–1455 ft, mean 796 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

#### **Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

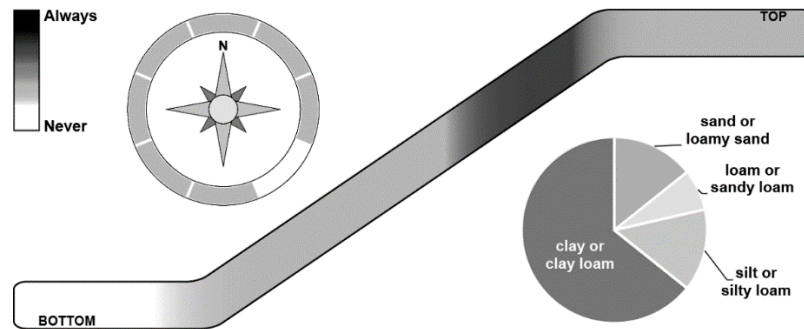
NatureServe global/state rank: G4T2T3/S2S3

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 66.7         | 45–90         | –          |
| <b>Herb</b>                          | 67.0         | 50–90         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.3          | 0–1           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 10.7° | 3–23°  |
| <b>Large rock cover</b>  | 0.3%  | 0–2%   |
| <b>Small rock cover</b>  | 1.4%  | 0–3%   |
| <b>Bare ground cover</b> | 10.1% | 1–40%  |
| <b>Litter cover</b>      | 77.9% | 48–95% |

**Associations within this Alliance:**

*Cynosurus echinatus* – (*Danthonia pilosa* – *Nassella manicata*) Provisional Semi-Natural Association

**STAND TABLE**

***Cynosurus echinatus* Semi-Natural Alliance**

n = 15

| Lifeform     | Code  | Botanical Name                 | Con | Avg  | Min | Max  |
|--------------|-------|--------------------------------|-----|------|-----|------|
| <b>Shrub</b> |       |                                |     |      |     |      |
|              | BAPI  | <i>Baccharis pilularis</i>     | 27  | 0.2  | 0.1 | 0.2  |
| <b>Herb</b>  |       |                                |     |      |     |      |
|              | HYRA3 | <i>Hypochaeris radicata</i>    | 100 | 9.9  | 0.2 | 68.0 |
|              | VUBR  | <i>Vulpia bromoides</i>        | 93  | 13.2 | 0.2 | 38.0 |
|              | CYEC  | <i>Cynosurus echinatus</i>     | 87  | 36.5 | 8.0 | 68.0 |
|              | AVBA  | <i>Avena barbata</i>           | 87  | 7.7  | 0.2 | 38.0 |
|              | LOPE  | <i>Lolium perenne</i>          | 87  | 6.0  | 0.2 | 38.0 |
|              | RUAC3 | <i>Rumex acetosella</i>        | 87  | 5.2  | 0.2 | 38.0 |
|              | 2DAPI | <i>Danthonia pilosa</i>        | 80  | 14.3 | 0.2 | 68.0 |
|              | BRHO2 | <i>Bromus hordeaceus</i>       | 80  | 4.2  | 0.2 | 18.0 |
|              | AICA  | <i>Aira caryophyllea</i>       | 80  | 1.1  | 0.2 | 3.0  |
|              | LIBI5 | <i>Linum bienne</i>            | 80  | 0.7  | 0.2 | 3.0  |
|              | PLLA  | <i>Plantago lanceolata</i>     | 73  | 7.2  | 0.2 | 38.0 |
|              | ANAR  | <i>Anagallis arvensis</i>      | 73  | 0.9  | 0.2 | 8.0  |
|              | DIDO3 | <i>Dichondra donelliana</i>    | 60  | 4.0  | 0.2 | 18.0 |
|              | TRSU3 | <i>Trifolium subterraneum</i>  | 60  | 2.6  | 0.2 | 8.0  |
|              | TRDU2 | <i>Trifolium dubium</i>        | 60  | 1.1  | 0.2 | 3.0  |
|              | DACA3 | <i>Danthonia californica</i>   | 60  | 1.0  | 0.2 | 3.0  |
|              | BRDI2 | <i>Brachypodium distachyon</i> | 53  | 10.1 | 0.2 | 38.0 |
|              | NAPU4 | <i>Nassella pulchra</i>        | 53  | 3.3  | 0.2 | 8.0  |
|              | RORO  | <i>Romulea rosea</i>           | 53  | 1.9  | 0.2 | 8.0  |
|              | TRMA2 | <i>Trifolium macraei</i>       | 53  | 1.2  | 0.2 | 8.0  |
|              | ERCI6 | <i>Erodium cicutarium</i>      | 53  | 0.6  | 0.2 | 3.0  |
|              | SIGA  | <i>Silene gallica</i>          | 53  | 0.2  | 0.2 | 0.2  |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

**Cynosurus echinatus Semi-Natural Alliance**

n = 15

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | NAMA7  | <i>Nassella manicata</i>                         | 47  | 18.7 | 0.2 | 38.0 |
|          | HOLA   | <i>Holcus lanatus</i>                            | 47  | 3.3  | 0.2 | 8.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 47  | 2.8  | 0.2 | 8.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                     | 47  | 1.0  | 0.2 | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                               | 40  | 1.1  | 0.2 | 3.0  |
|          | VISA   | <i>Vicia sativa</i>                              | 40  | 0.7  | 0.2 | 3.0  |
|          | GEDI   | <i>Geranium dissectum</i>                        | 40  | 0.7  | 0.2 | 3.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                       | 40  | 0.7  | 0.2 | 3.0  |
|          | TRGL4  | <i>Trifolium glomeratum</i>                      | 33  | 8.3  | 0.2 | 38.0 |
|          | LOAN2  | <i>Lotus angustissimus</i>                       | 33  | 2.9  | 0.2 | 8.0  |
|          | LITR4  | <i>Linum trigynum</i>                            | 33  | 1.3  | 0.2 | 3.0  |
|          | BRCA5  | <i>Bromus carinatus</i>                          | 33  | 0.8  | 0.2 | 3.0  |
|          | ERBO   | <i>Erodium botrys</i>                            | 33  | 0.8  | 0.2 | 3.0  |
|          | JUBU   | <i>Juncus bufonius</i>                           | 33  | 0.8  | 0.2 | 3.0  |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33  | 0.8  | 0.2 | 3.0  |
|          | JUOC2  | <i>Juncus occidentalis</i>                       | 33  | 0.2  | 0.2 | 0.2  |
|          | LOGA2  | <i>Logfia gallica</i>                            | 33  | 0.2  | 0.1 | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>                             | 33  | 0.2  | 0.1 | 0.2  |
|          | TRLA16 | <i>Triteleia laxa</i>                            | 33  | 0.2  | 0.1 | 0.2  |
|          | LETA   | <i>Leontodon taraxacoides</i>                    | 27  | 5.4  | 0.2 | 18.0 |
|          | HYGL2  | <i>Hypochaeris glabra</i>                        | 27  | 2.2  | 0.2 | 8.0  |
|          | PHAQ   | <i>Phalaris aquatica</i>                         | 27  | 2.1  | 0.1 | 8.0  |
|          | BRMA   | <i>Briza maxima</i>                              | 27  | 1.1  | 0.2 | 3.0  |
|          | LYHY3  | <i>Lythrum hyssopifolium</i>                     | 27  | 0.9  | 0.2 | 3.0  |
|          | GAPH2  | <i>Gastridium phleoides</i>                      | 27  | 0.2  | 0.2 | 0.2  |
|          | IRDO   | <i>Iris douglasiana</i>                          | 20  | 4.3  | 2.0 | 8.0  |
|          | ELGL   | <i>Elymus glaucus</i>                            | 20  | 3.7  | 0.2 | 8.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 20  | 2.0  | 0.1 | 3.0  |
|          | HOBR2  | <i>Hordeum brachyantherum</i>                    | 20  | 1.1  | 0.2 | 3.0  |
|          | LUPIN  | <i>Lupinus</i>                                   | 20  | 1.1  | 0.2 | 3.0  |
|          | LUNA3  | <i>Lupinus nanus</i>                             | 20  | 1.1  | 0.2 | 3.0  |
|          | SHAR2  | <i>Sherardia arvensis</i>                        | 20  | 1.1  | 0.2 | 3.0  |
|          | CIVU   | <i>Cirsium vulgare</i>                           | 20  | 0.2  | 0.2 | 0.2  |
|          | DAPU3  | <i>Daucus pusillus</i>                           | 20  | 0.2  | 0.2 | 0.2  |
|          | SOSE2  | <i>Soliva sessilis</i>                           | 20  | 0.2  | 0.2 | 0.2  |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Cynosurus echinatus* – (*Danthonia pilosa* – *Nassella manicata*) Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (12) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.8         | 45–90         | –          |
| <b>Herb</b>                          | 66.3         | 50–90         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.3          | 0–1           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (2), SE (1), SW (8)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), ridge top (1), upper 1/3 of slope (9)

**Microtopography:** concave (3), convex (4), flat (5)

**Parent material:** metasedimentary (8), sedimentary (4)

**Soil texture:** clay or clay loam (7), loam or sandy loam (1), sand (1), silt or silt loam (2)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (11)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 766 ft. | 156–1111 ft. |
| <b>Slope</b>             | 11.2°   | 3–23°        |
| <b>Large rock cover</b>  | 0.2%    | 0–1%         |
| <b>Small rock cover</b>  | 1.3%    | 0–2%         |
| <b>Bare ground cover</b> | 11.7%   | 1–40%        |
| <b>Litter cover</b>      | 78.4%   | 48–95%       |

**Samples Used to Describe Association (n=12)**

**Rapid Assessments:** none

**Relevés:** HEAD0079, HEAD0087, HEAD0088, HEAD0155, HEAD0179, HEAD0180, HEAD0186, HEAD0188, HEAD0190, HEAD0273, HEAD0282, SONO0758

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Cynosurus echinatus* – (*Danthonia pilosa* – *Nassella manicata*) Provisional Semi-Natural Association**

n = 12

| Lifeform | Code  | Botanical Name              | Con | Avg  | Min | Max  |
|----------|-------|-----------------------------|-----|------|-----|------|
| Shrub    | BAPI  | <i>Baccharis pilularis</i>  | 25  | 0.2  | 0.1 | 0.2  |
|          |       |                             |     |      |     |      |
| Herb     | HYRA3 | <i>Hypochaeris radicata</i> | 100 | 10.9 | 0.2 | 68.0 |
|          | 2DAPI | <i>Danthonia pilosa</i>     | 92  | 15.5 | 3.0 | 68.0 |
|          | VUBR  | <i>Vulpia bromoides</i>     | 92  | 8.2  | 0.2 | 18.0 |



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Cynosurus echinatus* – (*Danthonia pilosa* – *Nassella manicata*) Provisional Semi-Natural Association**

n = 12

| Lifeform<br>Herb | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|------------------|--------|--|-----|------|------|------|
|                  | AVBA   | <i>Avena barbata</i>                             | 92  | 8.1  | 0.2  | 38.0 |
|                  | LOPE   | <i>Lolium perenne</i>                            | 92  | 6.6  | 0.2  | 38.0 |
|                  | CYEC   | <i>Cynosurus echinatus</i>                       | 83  | 41.0 | 18.0 | 68.0 |
|                  | PLLA   | <i>Plantago lanceolata</i>                       | 83  | 7.9  | 0.2  | 38.0 |
|                  | RUAC3  | <i>Rumex acetosella</i>                          | 83  | 4.8  | 0.2  | 38.0 |
|                  | BRHO2  | <i>Bromus hordeaceus</i>                         | 83  | 3.2  | 0.2  | 8.0  |
|                  | ANAR   | <i>Anagallis arvensis</i>                        | 83  | 1.0  | 0.2  | 8.0  |
|                  | LIBI5  | <i>Linum bienne</i>                              | 83  | 0.8  | 0.2  | 3.0  |
|                  | AICA   | <i>Aira caryophylla</i>                          | 75  | 1.1  | 0.2  | 3.0  |
|                  | TRDU2  | <i>Trifolium dubium</i>                          | 75  | 1.1  | 0.2  | 3.0  |
|                  | DACA3  | <i>Danthonia californica</i>                     | 75  | 1.0  | 0.2  | 3.0  |
|                  | BRDI2  | <i>Brachypodium distachyon</i>                   | 67  | 10.1 | 0.2  | 38.0 |
|                  | TRSU3  | <i>Trifolium subterraneum</i>                    | 67  | 2.9  | 0.2  | 8.0  |
|                  | RORO   | <i>Romulea rosea</i>                             | 67  | 1.9  | 0.2  | 8.0  |
|                  | NAMA7  | <i>Nassella manicata</i>                         | 58  | 18.7 | 0.2  | 38.0 |
|                  | NAPU4  | <i>Nassella pulchra</i>                          | 58  | 3.3  | 0.2  | 8.0  |
|                  | DIDO3  | <i>Dichondra donelliana</i>                      | 58  | 2.1  | 0.2  | 8.0  |
|                  | HOLA   | <i>Holcus lanatus</i>                            | 50  | 3.4  | 0.2  | 8.0  |
|                  | BRMI2  | <i>Briza minor</i>                               | 50  | 1.1  | 0.2  | 3.0  |
|                  | SIBE   | <i>Sisyrinchium bellum</i>                       | 50  | 0.7  | 0.2  | 3.0  |
|                  | ERCI6  | <i>Erodium cicutarium</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|                  | SIGA   | <i>Silene gallica</i>                            | 50  | 0.2  | 0.2  | 0.2  |
|                  | TRMA2  | <i>Trifolium macraei</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|                  | LOAN2  | <i>Lotus angustissimus</i>                       | 42  | 2.9  | 0.2  | 8.0  |
|                  | CAPY2  | <i>Carduus pycnocephalus</i>                     | 42  | 1.3  | 0.2  | 3.0  |
|                  | LITR4  | <i>Linum trigynum</i>                            | 42  | 1.3  | 0.2  | 3.0  |
|                  | JUBU   | <i>Juncus bufonius</i>                           | 42  | 0.8  | 0.2  | 3.0  |
|                  | JUOC2  | <i>Juncus occidentalis</i>                       | 42  | 0.2  | 0.2  | 0.2  |
|                  | SOAS   | <i>Sonchus asper</i>                             | 42  | 0.2  | 0.1  | 0.2  |
|                  | TRLA16 | <i>Triteleia laxa</i>                            | 42  | 0.2  | 0.1  | 0.2  |
|                  | LETA   | <i>Leontodon taraxacoides</i>                    | 33  | 5.4  | 0.2  | 18.0 |
|                  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 33  | 0.9  | 0.2  | 3.0  |
|                  | TRGL4  | <i>Trifolium glomeratum</i>                      | 33  | 0.9  | 0.2  | 3.0  |
|                  | BRDI3  | <i>Bromus diandrus</i>                           | 33  | 0.9  | 0.2  | 3.0  |
|                  | BRCA5  | <i>Bromus carinatus</i>                          | 33  | 0.9  | 0.2  | 3.0  |
|                  | LYHY3  | <i>Lythrum hyssopifolium</i>                     | 33  | 0.9  | 0.2  | 3.0  |
|                  | GAPH2  | <i>Gastridium phleoides</i>                      | 33  | 0.2  | 0.2  | 0.2  |
|                  | VISA   | <i>Vicia sativa</i>                              | 33  | 0.2  | 0.2  | 0.2  |
|                  | GEDI   | <i>Geranium dissectum</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|                  | ERBO   | <i>Erodium botrys</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|                  | LOGA2  | <i>Logfia gallica</i>                            | 33  | 0.2  | 0.1  | 0.2  |
|                  | IRDO   | <i>Iris douglasiana</i>                          | 25  | 4.3  | 2.0  | 8.0  |
|                  | ELGL   | <i>Elymus glaucus</i>                            | 25  | 3.7  | 0.2  | 8.0  |
|                  | PHAQ   | <i>Phalaris aquatica</i>                         | 25  | 2.8  | 0.1  | 8.0  |
|                  | HOBR2  | <i>Hordeum brachyantherum</i>                    | 25  | 1.1  | 0.2  | 3.0  |
|                  | BRMA   | <i>Briza maxima</i>                              | 25  | 0.5  | 0.2  | 1.0  |

**STAND TABLE** continued

***Cynosurus echinatus* – (*Danthonia pilosa* – *Nassella manicata*) Provisional Semi-Natural Association**

n = 12

| Lifeform | Code  | Botanical Name         | Con | Avg | Min | Max |
|----------|-------|------------------------|-----|-----|-----|-----|
| Herb     | DAPU3 | <i>Daucus pusillus</i> | 25  | 0.2 | 0.2 | 0.2 |
|          | SOSE2 | <i>Soliva sessilis</i> | 25  | 0.2 | 0.2 | 0.2 |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

## ***Danthonia californica* Alliance**

### **California oat grass prairie**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Danthonia californica* is dominant or co-dominant in the herbaceous layer with *Aira caryophyllea*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Bromus carinatus*, *Carex tumulicola*, *Danthonia pilosa*, *Epilobium* spp., *Festuca* spp., *Holcus lanatus*, *Iris douglasiana*, *Juncus arcticus*, *Lolium perenne*, *Lupinus rivularis*, *Melica californica*, *Muhlenbergia filiformis*, *Nassella pulchra*, *Plantago lanceolata*, *Poa pratensis*, *Poa secunda*, *Potentilla gracilis*, *Pteridium aquilinum*, *Ranunculus californicus*, *Ranunculus occidentalis*, *Rumex acetosella*, and *Sisyrinchium bellum*. Emergent trees or shrubs may be present at low cover, including *Baccharis pilularis*.

Perennial grasslands with rich, moist soils along the central coast are referred to as coastal prairie (Ford and Hayes 2007). On the coast north of Marin County, the coastal prairie occurs in two settings: terrace prairies along the coastline, and the Bald Hills prairies on inland ridges and hilltops. Stands with similar species composition also occur inland in California where annual rainfall is greater than 100 cm. Both the inland and coastal grasslands are included in this alliance.

*Danthonia californica* dominated many coastal prairies historically (Burt-Davey 1902), but today these sites contain many non-native perennial grasses such as *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Rytidosperma penicillatum*, and *Holcus lanatus*, as well as non-native annual grasses such as *Bromus hordeaceus*, *Cynosurus cristatus*, *Lolium perenne*, and *Taeniatherum caput-medusae* (Saenz 1983, Saenz and Sawyer 1986).

#### Sonoma County

The *Danthonia californica* Alliance is commonly considered part of the coastal prairie in Sonoma County. However, stands also occasionally exist in mesic settings in the inner mountainous parts of the county. *Danthonia californica* Alliance stands are commonly associated with *Juncus (effusus, patens)* and *Nassella* spp. – *Melica* spp. Alliance stands.

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#### **Local Alliance Summary (n = 22)**

**Elevation:** 195–2057 ft, mean 860 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

#### **Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

*Hesperovax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe global/state rank: G4T3/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

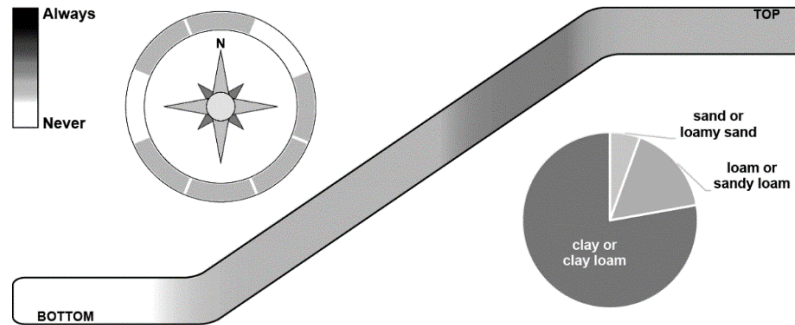
**Noteworthy Taxa, continued**

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 62.3         | 20–95         | –          |
| <b>Herb</b>                          | 62.5         | 20–95         | <0.5–1     |
| <b>Shrub</b>                         | 0.4          | 0–3           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 10.3° | 1–18° |
| <b>Large rock cover</b>  | 0.4%  | 0–3%  |
| <b>Small rock cover</b>  | 1.1%  | 0–5%  |
| <b>Bare ground cover</b> | 15.7% | 0–87% |
| <b>Litter cover</b>      | 74.3% | 5–97% |

**Associations within this Alliance:**

*Danthonia californica* – (*Briza maxima* – *Vulpia bromoides*) Provisional Association

*Danthonia californica* – *Nassella pulchra* Provisional Association

**STAND TABLE**

***Danthonia californica* Alliance**

n = 22

| Lifeform | Code  | Botanical Name               | Con | Avg  | Min | Max  |
|----------|-------|------------------------------|-----|------|-----|------|
| Herb     | DACA3 | <i>Danthonia californica</i> | 100 | 15.8 | 3.0 | 60.0 |
|          | HYRA3 | <i>Hypochaeris radicata</i>  | 91  | 6.5  | 0.2 | 38.0 |
|          | BRHO2 | <i>Bromus hordeaceus</i>     | 91  | 2.8  | 0.2 | 15.0 |
|          | NAPU4 | <i>Nassella pulchra</i>      | 82  | 6.0  | 0.2 | 18.0 |
|          | VUBR  | <i>Vulpia bromoides</i>      | 82  | 5.8  | 0.2 | 25.0 |
|          | PLLA  | <i>Plantago lanceolata</i>   | 82  | 3.7  | 0.2 | 18.0 |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

**Danthonia californica Alliance**

n = 22

| Lifeform | Code  | Botanical Name                  | Con | Avg  | Min | Max  |
|----------|-------|---------------------------------|-----|------|-----|------|
| Herb     | ANAR  | <i>Anagallis arvensis</i>       | 82  | 0.5  | 0.2 | 3.0  |
|          | SIBE  | <i>Sisyrinchium bellum</i>      | 77  | 0.9  | 0.1 | 8.0  |
|          | LIBI5 | <i>Linum bienne</i>             | 77  | 0.4  | 0.2 | 4.0  |
|          | AVBA  | <i>Avena barbata</i>            | 73  | 1.0  | 0.2 | 3.0  |
|          | LOPE  | <i>Lolium perenne</i>           | 68  | 2.0  | 0.2 | 12.0 |
|          | BRMI2 | <i>Briza minor</i>              | 68  | 0.8  | 0.1 | 3.0  |
|          | VISA  | <i>Vicia sativa</i>             | 68  | 0.4  | 0.2 | 3.0  |
|          | BRDI3 | <i>Bromus diandrus</i>          | 64  | 1.6  | 0.2 | 3.0  |
|          | GEDI  | <i>Geranium dissectum</i>       | 64  | 0.4  | 0.2 | 3.0  |
|          | CYEC  | <i>Cynosurus echinatus</i>      | 59  | 8.4  | 0.2 | 38.0 |
|          | AICA  | <i>Aira caryophyllea</i>        | 55  | 6.3  | 0.2 | 68.0 |
|          | RUAC3 | <i>Rumex acetosella</i>         | 55  | 1.1  | 0.1 | 8.0  |
|          | CIVU  | <i>Cirsium vulgare</i>          | 50  | 0.8  | 0.1 | 3.0  |
|          | ELGL  | <i>Elymus glaucus</i>           | 45  | 2.5  | 0.1 | 12.0 |
|          | BRMA  | <i>Briza maxima</i>             | 41  | 12.0 | 0.2 | 38.0 |
|          | HYGL2 | <i>Hypochaeris glabra</i>       | 41  | 2.7  | 0.2 | 9.0  |
|          | TRDU2 | <i>Trifolium dubium</i>         | 41  | 0.8  | 0.1 | 3.0  |
|          | CAPY2 | <i>Carduus pycnocephalus</i>    | 36  | 0.2  | 0.2 | 0.2  |
|          | PLER3 | <i>Plantago erecta</i>          | 32  | 6.4  | 0.2 | 18.0 |
|          | CHPO3 | <i>Chlorogalum pomeridianum</i> | 32  | 3.1  | 0.1 | 18.0 |
|          | DAPU3 | <i>Daucus pusillus</i>          | 32  | 0.2  | 0.2 | 0.2  |
|          | HOLA  | <i>Holcus lanatus</i>           | 27  | 10.0 | 0.2 | 18.0 |
|          | DIDO3 | <i>Dichondra donelliana</i>     | 27  | 2.6  | 0.2 | 12.0 |
|          | TRSU3 | <i>Trifolium subterraneum</i>   | 27  | 0.8  | 0.1 | 3.0  |
|          | SOAS  | <i>Sonchus asper</i>            | 27  | 0.2  | 0.2 | 0.2  |
|          | 2DAPI | <i>Danthonia pilosa</i>         | 23  | 12.8 | 3.0 | 32.0 |
|          | BRDI2 | <i>Brachypodium distachyon</i>  | 23  | 2.9  | 0.2 | 8.0  |
|          | CEGL2 | <i>Cerastium glomeratum</i>     | 23  | 0.2  | 0.1 | 0.2  |
|          | SIGA  | <i>Silene gallica</i>           | 23  | 0.2  | 0.1 | 0.2  |

**Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Danthonia californica* – (*Briza maxima* – *Vulpia bromoides*) Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (7), Coastal Hills-Santa Rosa Plain/263Aj (2), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.7         | 50–95         | –          |
| <b>Herb</b>                          | 70.5         | 50–95         | <0.5–1     |
| <b>Shrub</b>                         | 0.4          | 0–3           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (3), SE (4), SW (3)

**Macrotopography:** lower 1/3 of slope (2), upper 1/3 of slope (8), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (3), convex (3), flat (5)

**Parent material:** Franciscan melange (3), igneous (1), metasedimentary (4), sandstone (2), volcanic (1)

**Soil texture:** clay or clay loam (6), loam or sandy loam (1), unknown (1)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (8)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1123 ft. | 195–2057 ft. |
| <b>Slope</b>             | 7.6°     | 1–15°        |
| <b>Large rock cover</b>  | 0.3%     | 0–3%         |
| <b>Small rock cover</b>  | 1.3%     | 0–5%         |
| <b>Bare ground cover</b> | 9.6%     | 0–87%        |
| <b>Litter cover</b>      | 81.5%    | 5–97%        |

**Samples Used to Describe Association (n=11)**

**Rapid Assessments:** none

**Relevés:** HEAD0002, HEAD0003, HEAD0165, HEAD0217, HEAD0285, MILOB113, MILOB119, SONO0341, SONO0755, SONO0759, SONO0938

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Danthonia californica* – (*Briza maxima* – *Vulpia bromoides*) Provisional Association**

n = 11

| Lifeform | Code  | Botanical Name               | Con | Avg  | Min | Max  |
|----------|-------|------------------------------|-----|------|-----|------|
| Herb     | DACA3 | <i>Danthonia californica</i> | 100 | 24.9 | 3.0 | 60.0 |
|          | HYRA3 | <i>Hypochaeris radicata</i>  | 82  | 3.8  | 0.2 | 8.0  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Danthonia californica* – (*Briza maxima* – *Vulpia bromoides*) Provisional Association**

n = 11

| Lifeform<br>Herb | Code  | Botanical Name                    | Con | Avg  | Min | Max  |
|------------------|-------|-----------------------------------|-----|------|-----|------|
|                  | BRHO2 | <i>Bromus hordeaceus</i>          | 82  | 2.9  | 0.2 | 15.0 |
|                  | SIBE  | <i>Sisyrinchium bellum</i>        | 82  | 1.4  | 0.2 | 8.0  |
|                  | VUBR  | <i>Vulpia bromoides</i>           | 73  | 8.7  | 0.2 | 25.0 |
|                  | PLLA  | <i>Plantago lanceolata</i>        | 73  | 4.1  | 0.2 | 8.0  |
|                  | NAPU4 | <i>Nassella pulchra</i>           | 73  | 1.0  | 0.2 | 3.0  |
|                  | LIBI5 | <i>Linum bienne</i>               | 73  | 0.2  | 0.2 | 0.2  |
|                  | ANAR  | <i>Anagallis arvensis</i>         | 73  | 0.2  | 0.2 | 0.2  |
|                  | GED1  | <i>Geranium dissectum</i>         | 64  | 0.6  | 0.2 | 3.0  |
|                  | VISA  | <i>Vicia sativa</i>               | 64  | 0.2  | 0.2 | 0.2  |
|                  | CYEC  | <i>Cynosurus echinatus</i>        | 55  | 7.4  | 0.2 | 38.0 |
|                  | LOPE  | <i>Lolium perenne</i>             | 55  | 3.4  | 0.2 | 12.0 |
|                  | BRMI2 | <i>Briza minor</i>                | 55  | 0.7  | 0.2 | 3.0  |
|                  | RUAC3 | <i>Rumex acetosella</i>           | 55  | 0.7  | 0.1 | 3.0  |
|                  | BRMA  | <i>Briza maxima</i>               | 45  | 16.6 | 0.2 | 38.0 |
|                  | AICA  | <i>Aira caryophyllea</i>          | 45  | 14.3 | 0.2 | 68.0 |
|                  | ELGL  | <i>Elymus glaucus</i>             | 45  | 3.1  | 0.1 | 12.0 |
|                  | HYGL2 | <i>Hypochaeris glabra</i>         | 45  | 3.1  | 0.2 | 9.0  |
|                  | AVBA  | <i>Avena barbata</i>              | 45  | 1.3  | 0.2 | 3.0  |
|                  | BRDI3 | <i>Bromus diandrus</i>            | 45  | 1.3  | 0.2 | 3.0  |
|                  | CEGL2 | <i>Cerastium glomeratum</i>       | 45  | 0.2  | 0.1 | 0.2  |
|                  | CIVU  | <i>Cirsium vulgare</i>            | 36  | 1.1  | 0.2 | 3.0  |
|                  | TRSU3 | <i>Trifolium subterraneum</i>     | 36  | 0.4  | 0.2 | 1.0  |
|                  | RACA2 | <i>Ranunculus californicus</i>    | 36  | 0.2  | 0.2 | 0.2  |
|                  | ERCI6 | <i>Erodium cicutarium</i>         | 36  | 0.2  | 0.2 | 0.2  |
|                  | SIGA  | <i>Silene gallica</i>             | 36  | 0.2  | 0.2 | 0.2  |
|                  | TACA8 | <i>Taeniatherum caput-medusae</i> | 36  | 0.2  | 0.2 | 0.2  |
|                  | TRDU2 | <i>Trifolium dubium</i>           | 36  | 0.2  | 0.2 | 0.2  |
|                  | CAPY2 | <i>Carduus pycnocephalus</i>      | 36  | 0.2  | 0.2 | 0.2  |
|                  | CHPO3 | <i>Chlorogalum pomeridianum</i>   | 27  | 6.1  | 0.1 | 18.0 |
|                  | DIDO3 | <i>Dichondra donnelliana</i>      | 27  | 5.1  | 0.2 | 12.0 |
|                  | PLER3 | <i>Plantago erecta</i>            | 27  | 2.8  | 0.2 | 8.0  |
|                  | SOAS  | <i>Sonchus asper</i>              | 27  | 0.2  | 0.2 | 0.2  |
|                  | DAPU3 | <i>Daucus pusillus</i>            | 27  | 0.2  | 0.2 | 0.2  |
|                  | SHAR2 | <i>Sherardia arvensis</i>         | 27  | 0.2  | 0.2 | 0.2  |

**Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Hesperovax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Danthonia californica* – *Nassella pulchra* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) and Coastal Hills-Santa Rosa Plain/263Aj (5) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 51.6         | 20–90         | –          |
| <b>Herb</b>                          | 51.5         | 20–90         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.4          | 0–1           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), SE (5), SW (2)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (3), ridge top (2), upper 1/3 of slope (4)

**Microtopography:** concave (1), convex (3), flat (6)

**Parent material:** Franciscan melange (1), metasedimentary (7), sedimentary (2)

**Soil texture:** clay or clay loam (7), loam or sandy loam (2), sand (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (9)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 563 ft. | 213–994 ft. |
| <b>Slope</b>             | 13.1°   | 5–18°       |
| <b>Large rock cover</b>  | 0.5%    | 0–3%        |
| <b>Small rock cover</b>  | 0.8%    | 0–2%        |
| <b>Bare ground cover</b> | 23.5%   | 0–86%       |
| <b>Litter cover</b>      | 66.1%   | 5–92%       |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** none

**Relevés:** HEAD0001, HEAD0004, HEAD0005, HEAD0007, HEAD0081, HEAD0106, HEAD0109, HEAD0274, HEAD0327, MILOB115

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Danthonia californica* – *Nassella pulchra* Provisional Association**

n = 10

| Lifeform | Code  | Botanical Name               | Con | Avg  | Min | Max  |
|----------|-------|------------------------------|-----|------|-----|------|
| Shrub    | RUUR  | <i>Rubus ursinus</i>         | 20  | 0.2  | 0.2 | 0.2  |
|          |       |                              |     |      |     |      |
| Herb     | NAPU4 | <i>Nassella pulchra</i>      | 100 | 10.0 | 3.0 | 18.0 |
|          | HYRA3 | <i>Hypochaeris radicata</i>  | 100 | 9.5  | 0.2 | 38.0 |
|          | DACA3 | <i>Danthonia californica</i> | 100 | 6.5  | 3.0 | 21.0 |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Danthonia californica* – *Nassella pulchra* Provisional Association**

n = 10

| <b>Lifeform</b><br><b>Herb</b> | <b>Code</b> | <b>Botanical Name</b>                             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--------------------------------|-------------|---|------------|------------|------------|------------|
|                                | BRHO2       | <i>Bromus hordeaceus</i>                          | 100        | 3.0        | 0.2        | 8.0        |
|                                | AVBA        | <i>Avena barbata</i>                              | 100        | 0.8        | 0.2        | 3.0        |
|                                | VUBR        | <i>Vulpia bromoides</i>                           | 90         | 3.8        | 0.2        | 8.0        |
|                                | PLLA        | <i>Plantago lanceolata</i>                        | 90         | 3.4        | 0.2        | 18.0       |
|                                | ANAR        | <i>Anagallis arvensis</i>                         | 90         | 0.8        | 0.2        | 3.0        |
|                                | BRMI2       | <i>Briza minor</i>                                | 90         | 0.8        | 0.1        | 3.0        |
|                                | BRDI3       | <i>Bromus diandrus</i>                            | 80         | 2.0        | 0.2        | 3.0        |
|                                | LOPE        | <i>Lolium perenne</i>                             | 80         | 1.2        | 0.2        | 8.0        |
|                                | LIBI5       | <i>Linum bienne</i>                               | 80         | 0.7        | 0.2        | 4.0        |
|                                | VISA        | <i>Vicia sativa</i>                               | 80         | 0.6        | 0.2        | 3.0        |
|                                | SIBE        | <i>Sisyrinchium bellum</i>                        | 70         | 0.3        | 0.1        | 1.0        |
|                                | CYEC        | <i>Cynosurus echinatus</i>                        | 60         | 9.5        | 0.2        | 38.0       |
|                                | AICA        | <i>Aira caryophylla</i>                           | 60         | 0.7        | 0.2        | 3.0        |
|                                | CIVU        | <i>Cirsium vulgare</i>                            | 60         | 0.6        | 0.1        | 3.0        |
|                                | GEDI        | <i>Geranium dissectum</i>                         | 60         | 0.2        | 0.2        | 0.2        |
|                                | TRDU2       | <i>Trifolium dubium</i>                           | 50         | 1.3        | 0.1        | 3.0        |
|                                | RUAC3       | <i>Rumex acetosella</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                                | HOLA        | <i>Holcus lanatus</i>                             | 40         | 14.3       | 3.0        | 18.0       |
|                                | PLER3       | <i>Plantago erecta</i>                            | 40         | 9.1        | 0.2        | 18.0       |
|                                | BRMA        | <i>Briza maxima</i>                               | 40         | 6.3        | 0.2        | 18.0       |
|                                | HYGL2       | <i>Hypochaeris glabra</i>                         | 40         | 2.3        | 0.2        | 3.0        |
|                                | ELGL        | <i>Elymus glaucus</i>                             | 40         | 1.6        | 0.2        | 3.0        |
|                                | CHPO3       | <i>Chlorogalum pomeridianum</i>                   | 40         | 0.9        | 0.2        | 3.0        |
|                                | NALE2       | <i>Nassella lepida</i>                            | 30         | 7.1        | 0.2        | 18.0       |
|                                | BRDI2       | <i>Brachypodium distachyon</i>                    | 30         | 4.1        | 1.2        | 8.0        |
|                                | JUOC2       | <i>Juncus occidentalis</i>                        | 30         | 0.2        | 0.2        | 0.2        |
|                                | CAPY2       | <i>Carduus pycnocephalus</i>                      | 30         | 0.2        | 0.2        | 0.2        |
|                                | TRLA16      | <i>Triteleia laxa</i>                             | 30         | 0.2        | 0.2        | 0.2        |
|                                | SOAS        | <i>Sonchus asper</i>                              | 30         | 0.2        | 0.2        | 0.2        |
|                                | DAPU3       | <i>Daucus pusillus</i>                            | 30         | 0.2        | 0.2        | 0.2        |
|                                | ACPIC2      | <i>Acaena pinnatifida</i> var. <i>californica</i> | 30         | 0.2        | 0.2        | 0.2        |
|                                | DIDO3       | <i>Dichondra donelliana</i>                       | 30         | 0.2        | 0.2        | 0.2        |
|                                | TRMA2       | <i>Trifolium macraei</i>                          | 30         | 0.1        | 0.1        | 0.2        |
|                                | 2DAPI       | <i>Danthonia pilosa</i>                           | 20         | 13.0       | 8.0        | 18.0       |
|                                | ANAR7       | <i>Anthoxanthum aristatum</i>                     | 20         | 3.0        | 3.0        | 3.0        |
|                                | BRCA5       | <i>Bromus carinatus</i>                           | 20         | 3.0        | 3.0        | 3.0        |
|                                | CAPU18      | <i>Calystegia purpurata</i>                       | 20         | 3.0        | 3.0        | 3.0        |
|                                | CAREX       | <i>Carex</i>                                      | 20         | 2.5        | 2.0        | 3.0        |
|                                | LOTUS       | <i>Lotus</i>                                      | 20         | 1.6        | 0.2        | 3.0        |
|                                | TRSU3       | <i>Trifolium subterraneum</i>                     | 20         | 1.6        | 0.1        | 3.0        |
|                                | LUNA3       | <i>Lupinus nanus</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | LUCO6       | <i>Luzula comosa</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | TRGL4       | <i>Trifolium glomeratum</i>                       | 20         | 0.2        | 0.2        | 0.2        |
|                                | VICIA       | <i>Vicia</i>                                      | 20         | 0.2        | 0.2        | 0.2        |
|                                | JUBU        | <i>Juncus bufonius</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                                | KOMA        | <i>Koeleria macrantha</i>                         | 20         | 0.2        | 0.1        | 0.2        |
|                                | BRODI       | <i>Brodiaea</i>                                   | 20         | 0.1        | 0.1        | 0.1        |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

## ***Deschampsia cespitosa* Alliance**

### **Tufted hair grass meadows**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Deschampsia cespitosa* is dominant or co-dominant in the herbaceous layer with other herbs that vary regionally. Species associated in coastal regions include *Agrostis stolonifera*, *Argentina egedii*, *Cirsium vulgare*, *Danthonia californica*, *Distichlis spicata*, *Holcus lanatus*, *Horkelia marinensis*, *Lilaeopsis masonii*, *Senecio hydrophiloides*, and *Triglochin striata*. Species associated in montane regions include *Bistorta bistortoides*, *Cardamine breweri*, *Carex nebrascensis*, *Carex subnigricans*, *Carex utriculata*, *Dodecatheon jeffreyi*, *Epilobium* spp., *Juncus arcticus*, *Muhlenbergia filiformis*, *Oreostemma alpigenum*, *Perideridia parishii*, *Senecio scorzonella*, *Solidago multiradiata*, and *Trifolium longipes*.

*Deschampsia cespitosa* is a complex circumpolar species with three subspecies (ssp. *beringensis*, ssp. *cespitosa*, ssp. *holciformis*) reported from California (Hickman 1993). Stands of these three subspecies range from sea level to alpine elevations. Lawrence (1945) demonstrated that coastal, montane, and alpine ecotypes were independent of taxonomic categories, so this alliance encompasses all these environments; the associations are structured to reflect the habitat. Stands along the coast interdigitate on a fine scale with herbaceous stands of the *Calamagrostis nutkaensis*, *Danthonia californica*, *Carex obnupta*, and *Juncus (effusus, patens)* Alliances, with woody stands of *Baccharis pilularis*, *Pinus muricata*, and *Pseudotsuga menziesii* Alliances, and with non-native types. Stands at montane to alpine elevations associate with stands of many meadow alliances and with woody stands of *Abies magnifica*, *Salix* spp., *Pinus contorta* ssp. *murrayana*, and *Tsuga mertensiana* Alliances.

#### Sonoma County

Stands of this alliance are associated with cooler and maritime settings. The majority of those sampled occur within 2 km of the coast. However, one *Deschampsia cespitosa* stand was found 14 km from the coast in the “wind gap” area of the south county near Freestone. This area is known to have regular incursions of summer fog and remains relatively cool for such an inland location. As with the taller coastal grass *Calamagrostis nutkaensis*, *Deschampsia* requires moisture and only tends to be found in upland stands where fog drip is a factor in the summer months. Unlike many stands around Humboldt Bay (Pickart 2006), none of the Sonoma County stands appear to be immediately adjacent to permanent wetlands. The majority of sampled stands are associated with a relatively high proportion of the non-native grass, *Holcus lanatus*. The other associations are more limited, especially the *Deschampsia cespitosa* – *Eryngium armatum* type, which is restricted to low-growing grasslands associated with coastal bluffs.

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#### **Local Alliance Summary (n = 31)**

**Elevation:** 38–652 ft, mean 213 ft

**SCV Global/State Rank:** G5/S4?<sup>2</sup>

#### **Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

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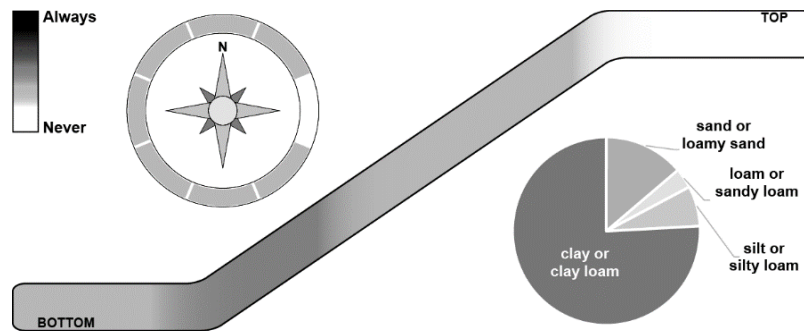
<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Noteworthy Taxa, continued**

- Hemizonia congesta* ssp. *congesta*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G5T1T2/S1S2
- Hesperervax sparsiflora* var. *brevifolia*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G4T3/S2
- Horkelia marinensis*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G2/S2
- Sidalcea malviflora* ssp. *purpurea*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G5T1/S1

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 84.0         | 55–95 <sup>1</sup> | –          |
| <b>Herb</b>                          | 81.2         | 35–98              | <0.5–0.5   |
| <b>Shrub</b>                         | 2.8          | 0–20               | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 6.3°  | 0–17°  |
| <b>Large rock cover</b>  | 1.2%  | 0–30%  |
| <b>Small rock cover</b>  | 1.2%  | 0–20%  |
| <b>Bare ground cover</b> | 6.2%  | 0–61%  |
| <b>Litter cover</b>      | 74.4% | 25–92% |

**Associations within this Alliance:**

- Deschampsia cespitosa* – *Danthonia californica* Association
- Deschampsia cespitosa* – *Eryngium armatum* Provisional Association
- Deschampsia cespitosa* – *Holcus lanatus* Provisional Association

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Deschampsia cespitosa* Alliance**

n = 31

| Lifeform | Code                         | Botanical Name                 | Con  | Avg  | Min  | Max  |
|----------|------------------------------|--------------------------------|------|------|------|------|
| Shrub    | RUUR                         | <i>Rubus ursinus</i>           | 58   | 3.4  | 0.1  | 8.0  |
|          | BAPI                         | <i>Baccharis pilularis</i>     | 32   | 3.2  | 0.2  | 8.0  |
| Herb     | DECE                         | <i>Deschampsia cespitosa</i>   | 100  | 27.2 | 0.2  | 68.0 |
|          | HOLA                         | <i>Holcus lanatus</i>          | 94   | 26.1 | 0.2  | 88.0 |
|          | PLLA                         | <i>Plantago lanceolata</i>     | 81   | 2.2  | 0.2  | 18.0 |
|          | SIBE                         | <i>Sisyrinchium bellum</i>     | 81   | 0.9  | 0.2  | 8.0  |
|          | DACA3                        | <i>Danthonia californica</i>   | 77   | 8.0  | 0.2  | 71.0 |
|          | ANAR                         | <i>Anagallis arvensis</i>      | 77   | 0.3  | 0.1  | 3.0  |
|          | VUBR                         | <i>Vulpia bromoides</i>        | 68   | 5.0  | 0.2  | 38.0 |
|          | HYRA3                        | <i>Hypochaeris radicata</i>    | 65   | 1.6  | 0.1  | 18.0 |
|          | GEDI                         | <i>Geranium dissectum</i>      | 65   | 0.8  | 0.2  | 3.0  |
|          | RUAC3                        | <i>Rumex acetosella</i>        | 61   | 1.1  | 0.2  | 8.0  |
|          | IRDO                         | <i>Iris douglasiana</i>        | 58   | 8.6  | 0.2  | 38.0 |
|          | CIVU                         | <i>Cirsium vulgare</i>         | 58   | 0.2  | 0.1  | 0.2  |
|          | AICA                         | <i>Aira caryophyllea</i>       | 55   | 0.5  | 0.2  | 3.0  |
|          | BRMI2                        | <i>Briza minor</i>             | 55   | 0.4  | 0.2  | 3.0  |
|          | SOAS                         | <i>Sonchus asper</i>           | 52   | 0.2  | 0.1  | 0.2  |
|          | BRCA5                        | <i>Bromus carinatus</i>        | 48   | 1.8  | 0.2  | 8.0  |
|          | JUBU                         | <i>Juncus bufonius</i>         | 48   | 1.8  | 0.2  | 8.0  |
|          | LUCO6                        | <i>Luzula comosa</i>           | 45   | 0.2  | 0.2  | 0.2  |
|          | RACA2                        | <i>Ranunculus californicus</i> | 45   | 0.2  | 0.1  | 0.2  |
|          | LETA                         | <i>Leontodon taraxacoides</i>  | 42   | 11.5 | 0.1  | 68.0 |
|          | VISA                         | <i>Vicia sativa</i>            | 42   | 0.2  | 0.2  | 0.2  |
|          | LIBI5                        | <i>Linum bienne</i>            | 42   | 0.2  | 0.1  | 0.2  |
|          | CAGY3                        | <i>Carex gynodynama</i>        | 39   | 3.8  | 0.2  | 8.0  |
|          | BRMA                         | <i>Briza maxima</i>            | 39   | 2.0  | 0.1  | 8.0  |
|          | JUPA2                        | <i>Juncus patens</i>           | 39   | 1.4  | 0.2  | 3.0  |
|          | MYDI                         | <i>Myosotis discolor</i>       | 39   | 1.1  | 0.2  | 8.0  |
|          | BRHO2                        | <i>Bromus hordeaceus</i>       | 39   | 0.4  | 0.2  | 3.0  |
|          | ERAR12                       | <i>Eryngium armatum</i>        | 35   | 14.1 | 0.2  | 68.0 |
|          | LOPE                         | <i>Lolium perenne</i>          | 35   | 6.8  | 0.2  | 38.0 |
|          | CATU3                        | <i>Carex tumulicola</i>        | 35   | 3.7  | 0.2  | 18.0 |
|          | ELGL                         | <i>Elymus glaucus</i>          | 35   | 2.9  | 0.2  | 8.0  |
|          | CYEC                         | <i>Cynosurus echinatus</i>     | 35   | 1.4  | 0.2  | 8.0  |
|          | LOFO2                        | <i>Lotus formosissimus</i>     | 35   | 0.2  | 0.1  | 0.2  |
| LOAN2    | <i>Lotus angustissimus</i>   | 32                             | 2.8  | 0.2  | 8.0  |      |
| JUOC2    | <i>Juncus occidentalis</i>   | 32                             | 1.0  | 0.1  | 8.0  |      |
| 2DAPI    | <i>Danthonia pilosa</i>      | 29                             | 2.1  | 0.2  | 3.0  |      |
| CAREX    | <i>Carex</i>                 | 26                             | 1.0  | 0.2  | 3.2  |      |
| GAPU3    | <i>Gamochaeta purpurea</i>   | 26                             | 0.2  | 0.2  | 0.2  |      |
| ANOD     | <i>Anthoxanthum odoratum</i> | 23                             | 10.8 | 0.2  | 38.0 |      |
| FRCH     | <i>Fragaria chiloensis</i>   | 23                             | 0.6  | 0.2  | 3.0  |      |
| SIMA2    | <i>Sidalcea malviflora</i>   | 23                             | 0.6  | 0.2  | 3.0  |      |
| DAPU3    | <i>Daucus pusillus</i>       | 23                             | 0.2  | 0.2  | 0.2  |      |
| LYHY3    | <i>Lythrum hyssopifolium</i> | 23                             | 0.2  | 0.2  | 0.2  |      |

**STAND TABLE** continued

***Deschampsia cespitosa* Alliance**

n = 31

| Lifeform | Code  | Botanical Name           | Con | Avg | Min | Max |
|----------|-------|--------------------------|-----|-----|-----|-----|
| Herb     |       |                          |     |     |     |     |
|          | TRDU2 | <i>Trifolium dubium</i>  | 23  | 0.2 | 0.2 | 0.2 |
|          | SOOL  | <i>Sonchus oleraceus</i> | 23  | 0.2 | 0.1 | 0.2 |

**Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Sidalcea malviflora* ssp. *purpurea*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1/S1

***Deschampsia cespitosa* – *Danthonia californica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover   | Height (m) |
|--------------------------------------|--------------|-----------------|------------|
| <b>Total vegetation</b>              | 55.0         | 55 <sup>1</sup> | –          |
| <b>Herb</b>                          | 59.0         | 58–60           | <0.5–0.5   |
| <b>Shrub</b>                         | 0.5          | 0–1             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0             | –          |
| <b>Conifer</b>                       | 0.0          | 0–0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SE (1)

**Macrotopography:** middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (2)

**Parent material:** Franciscan melange (1), metasedimentary (1)

**Soil texture:** silt or silt loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1)

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 396 ft. | 139–652 ft. |
| Slope             | 7.5°    | 5–10°       |
| Large rock cover  | 2.0%    | 1–3%        |
| Small rock cover  | 3.0%    | 3–3%        |
| Bare ground cover | 45.5%   | 30–61%      |
| Litter cover      | 52.0%   | 40–64%      |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none  
**Relevés:** HEAD0189, SONO0760

**SCV Global/State Rank:** G3/S2<sup>1</sup>

**STAND TABLE**

***Deschampsia cespitosa* – *Danthonia californica* Association**

n = 2

| Lifeform | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Herb     |        |   |     |      |      |      |
|          | DECE   | <i>Deschampsia cespitosa</i>                              | 100 | 31.5 | 25.0 | 38.0 |
|          | LOPE   | <i>Lolium perenne</i>                                     | 100 | 27.0 | 16.0 | 38.0 |
|          | DACA3  | <i>Danthonia californica</i>                              | 100 | 6.5  | 3.0  | 10.0 |
|          | LOWR2  | <i>Lotus wrangelianus</i>                                 | 100 | 4.1  | 0.2  | 8.0  |
|          | LASA   | <i>Lactuca saligna</i>                                    | 100 | 4.1  | 0.2  | 8.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                                | 100 | 2.5  | 2.0  | 3.0  |
|          | JUOC2  | <i>Juncus occidentalis</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|          | MIBI   | <i>Microseris bigelovii</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|          | RACA2  | <i>Ranunculus californicus</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|          | LACA7  | <i>Lasthenia californica</i>                              | 100 | 0.2  | 0.1  | 0.2  |
|          | HECOC2 | * <i>Hemizonia congesta</i> ssp. <i>congesta</i>          | 50  | 18.0 | 18.0 | 18.0 |
|          | CADED3 | <i>Castilleja densiflora</i> ssp. <i>densiflora</i>       | 50  | 3.0  | 3.0  | 3.0  |
|          | TRERR  | <i>Triphysaria eriantha</i> ssp. <i>rosea</i>             | 50  | 3.0  | 3.0  | 3.0  |
|          | TRMI5  | <i>Trifolium microdon</i>                                 | 50  | 3.0  | 3.0  | 3.0  |
|          | PEKE   | <i>Perideridia kelloggii</i>                              | 50  | 3.0  | 3.0  | 3.0  |
|          | CEMU2  | <i>Centaurium muehlenbergii</i>                           | 50  | 3.0  | 3.0  | 3.0  |
|          | JUBU   | <i>Juncus bufonius</i>                                    | 50  | 3.0  | 3.0  | 3.0  |
|          | HECO7  | * <i>Hemizonia congesta</i>                               | 50  | 2.0  | 2.0  | 2.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>            | 50  | 0.2  | 0.2  | 0.2  |
|          | TRLA16 | <i>Triteleia laxa</i>                                     | 50  | 0.2  | 0.2  | 0.2  |
|          | TRVEV  | <i>Triphysaria versicolor</i> ssp. <i>versicolor</i>      | 50  | 0.2  | 0.2  | 0.2  |
|          | PERID  | <i>Perideridia</i>  | 50  | 0.2  | 0.2  | 0.2  |
|          | TRBI   | <i>Trifolium bifidum</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|          | TRFU   | <i>Trifolium fucatum</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|          | HESPE1 | <i>Hesperevax</i>   | 50  | 0.2  | 0.2  | 0.2  |
|          | CHPOD  | * <i>Chlorogalum pomeridianum</i> var. <i>divaricatum</i> | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Deschampsia cespitosa* – *Danthonia californica* Association**

n = 2

| Lifeform | Code  | Botanical Name                                       | Con | Avg | Min | Max |
|----------|-------|--|-----|-----|-----|-----|
| Herb     | CHPO3 | * <i>Chlorogalum pomeridianum</i>                    | 50  | 0.2 | 0.2 | 0.2 |
|          | CAREX | <i>Carex</i>   | 50  | 0.2 | 0.2 | 0.2 |
|          | HESPB | <i>Hesperevax sparsiflora</i> var. <i>brevifolia</i> | 50  | 0.2 | 0.2 | 0.2 |
|          | TRVA  | <i>Trifolium variegatum</i>                          | 50  | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

*Hesperevax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Deschampsia cespitosa* – *Eryngium armatum* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) and Coastal Hills-Santa Rosa Plain/263Aj (6) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 86.7         | 70–95         | –          |
| Herb                          | 87.0         | 70–95         | –          |
| Shrub                         | 1.0          | 0–3           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2), SW (7)

**Macrotopography:** bottom (1), lower 1/3 of slope (9)

**Microtopography:** flat (8), undulating (2)

**Parent material:** metasedimentary (1), sedimentary (9)

**Soil texture:** clay or clay loam (6), sand (4)

**Slope steepness:** flat/0° (1), gentle/1-5° (7), moderate/6-25° (2)

|                  | Mean   | Range      |
|------------------|--------|------------|
| Elevation        | 79 ft. | 38–100 ft. |
| Slope            | 2.9°   | 0–6°       |
| Large rock cover | 0.2%   | 0–1%       |
| Small rock cover | 0.5%   | 0–1%       |



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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Bare ground cover | 5.1%  | 0–35%  |
| Litter cover      | 76.9% | 29–92% |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** none

**Relevés:** HEAD0097, HEAD0112, HEAD0157, HEAD0158, HEAD0205, HEAD0210, HEAD0252, HEAD0254, HEAD0288, HEAD0296

**SCV Global/State Rank:** G3G2?/S3S2?<sup>1</sup>

**STAND TABLE**

***Deschampsia cespitosa* – *Eryngium armatum* Provisional Association**

n = 10

| Lifeform | Code   | Botanical Name                                | Con | Avg  | Min | Max  |
|----------|--------|---|-----|------|-----|------|
| Shrub    | RUUR   | <i>Rubus ursinus</i>                          | 40  | 1.6  | 0.1 | 3.0  |
| Herb     | DECE   | <i>Deschampsia cespitosa</i>                  | 100 | 24.7 | 0.2 | 68.0 |
|          | HOLA   | <i>Holcus lanatus</i>                         | 100 | 18.9 | 0.2 | 88.0 |
|          | DACA3  | <i>Danthonia californica</i>                  | 90  | 16.7 | 0.2 | 71.0 |
|          | ERAR12 | <i>Eryngium armatum</i>                       | 90  | 16.3 | 0.2 | 68.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                    | 90  | 2.0  | 0.2 | 8.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                     | 90  | 0.5  | 0.1 | 3.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                    | 80  | 0.2  | 0.2 | 0.2  |
|          | LETA   | <i>Leontodon taraxacoides</i>                 | 70  | 18.2 | 0.1 | 68.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                       | 70  | 8.7  | 3.0 | 38.0 |
|          | RUAC3  | <i>Rumex acetosella</i>                       | 70  | 1.7  | 0.2 | 8.0  |
|          | JUBU   | <i>Juncus bufonius</i>                        | 70  | 1.4  | 0.2 | 3.0  |
|          | GEDI   | <i>Geranium dissectum</i>                     | 70  | 1.0  | 0.2 | 3.0  |
|          | LUCO6  | <i>Luzula comosa</i>                          | 70  | 0.2  | 0.2 | 0.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                   | 60  | 4.1  | 0.2 | 18.0 |
|          | AICA   | <i>Aira caryophyllea</i>                      | 60  | 1.1  | 0.2 | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                            | 60  | 0.2  | 0.2 | 0.2  |
|          | GAPU3  | <i>Gamochaeta purpurea</i>                    | 60  | 0.2  | 0.2 | 0.2  |
|          | RACA2  | <i>Ranunculus californicus</i>                | 60  | 0.2  | 0.1 | 0.2  |
|          | LOAN2  | <i>Lotus angustissimus</i>                    | 50  | 3.3  | 0.2 | 8.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                      | 50  | 0.8  | 0.2 | 3.0  |
|          | DAPU3  | <i>Daucus pusillus</i>                        | 50  | 0.2  | 0.2 | 0.2  |
|          | TRBA   | <i>Trifolium barbigerum</i>                   | 50  | 0.2  | 0.1 | 0.2  |
|          | AIPR   | <i>Aira praecox</i>                           | 50  | 0.2  | 0.1 | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>                          | 50  | 0.2  | 0.1 | 0.2  |
|          | SOOL   | <i>Sonchus oleraceus</i>                      | 50  | 0.2  | 0.1 | 0.2  |
|          | BRCA5  | <i>Bromus carinatus</i>                       | 40  | 1.6  | 0.2 | 3.0  |
|          | HOBR2  | <i>Hordeum brachyantherum</i>                 | 40  | 1.6  | 0.2 | 3.0  |
|          | IRDO   | <i>Iris douglasiana</i>                       | 40  | 0.9  | 0.2 | 3.0  |
|          | LUVE   | <i>Lupinus versicolor</i>                     | 40  | 0.9  | 0.2 | 3.0  |
|          | SIMA2  | <i>Sidalcea malviflora</i>                    | 40  | 0.9  | 0.2 | 3.0  |
|          | TRERR  | <i>Triphysaria eriantha</i> ssp. <i>rosea</i> | 40  | 0.9  | 0.2 | 3.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Deschampsia cespitosa* – *Eryngium armatum* Provisional Association**

n = 10

| Lifeform<br>Herb | Code   | Botanical Name  | Con | Avg  | Min | Max  |
|------------------|--------|---|-----|------|-----|------|
|                  | ARMAC2 | <i>Armeria maritima</i> ssp. <i>californica</i>         | 40  | 0.9  | 0.1 | 3.0  |
|                  | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>       | 40  | 0.2  | 0.2 | 0.2  |
|                  | LYHY3  | <i>Lythrum hyssopifolium</i>                            | 40  | 0.2  | 0.2 | 0.2  |
|                  | MYDI   | <i>Myosotis discolor</i>                                | 40  | 0.2  | 0.2 | 0.2  |
|                  | TRWO   | <i>Trifolium wormskioldii</i>                           | 40  | 0.2  | 0.1 | 0.2  |
|                  | ANMI4  | <i>Anagallis minima</i>                                 | 40  | 0.1  | 0.1 | 0.2  |
|                  | JUPHP2 | * <i>Juncus phaeocephalus</i> var. <i>phaeocephalus</i> | 30  | 15.4 | 0.2 | 38.0 |
|                  | JUPA2  | <i>Juncus patens</i>                                    | 30  | 3.0  | 3.0 | 3.0  |
|                  | CIQU2  | <i>Cirsium quercetorum</i>                              | 30  | 2.1  | 0.2 | 3.0  |
|                  | TRDU2  | <i>Trifolium dubium</i>                                 | 30  | 0.2  | 0.2 | 0.2  |
|                  | BRMA   | <i>Briza maxima</i>                                     | 30  | 0.2  | 0.2 | 0.2  |
|                  | CAREX  | <i>Carex</i>  | 30  | 0.2  | 0.2 | 0.2  |
|                  | CIVU   | <i>Cirsium vulgare</i>                                  | 30  | 0.2  | 0.2 | 0.2  |
|                  | CLDA   | <i>Clarkia davyi</i>                                    | 30  | 0.2  | 0.2 | 0.2  |
|                  | CYEC   | <i>Cynosurus echinatus</i>                              | 30  | 0.2  | 0.2 | 0.2  |
|                  | LOPE   | <i>Lolium perenne</i>                                   | 30  | 0.2  | 0.2 | 0.2  |
|                  | LOFO2  | <i>Lotus formosissimus</i>                              | 30  | 0.2  | 0.2 | 0.2  |
|                  | ISCA6  | <i>Isolepis carinata</i>                                | 30  | 0.1  | 0.1 | 0.2  |
|                  | TRSU3  | <i>Trifolium subterraneum</i>                           | 20  | 4.1  | 0.2 | 8.0  |
|                  | PLER3  | <i>Plantago erecta</i>                                  | 20  | 4.1  | 0.2 | 8.0  |
|                  | CASTI2 | <i>Castilleja</i>                                       | 20  | 1.6  | 0.2 | 3.0  |
|                  | JUPH   | * <i>Juncus phaeocephalus</i>                           | 20  | 1.6  | 0.2 | 3.0  |
|                  | HESPB  | <i>Hesperervax sparsiflora</i> var. <i>brevifolia</i>   | 20  | 0.2  | 0.2 | 0.2  |
|                  | SOSE2  | <i>Soliva sessilis</i>                                  | 20  | 0.2  | 0.2 | 0.2  |
|                  | RORO   | <i>Romulea rosea</i>                                    | 20  | 0.2  | 0.2 | 0.2  |
|                  | POGOG  | <i>Pogogyne</i>   | 20  | 0.2  | 0.2 | 0.2  |
|                  | PLEL   | <i>Plantago elongata</i>                                | 20  | 0.2  | 0.2 | 0.2  |
|                  | TRPU16 | <i>Triphysaria pusilla</i>                              | 20  | 0.2  | 0.2 | 0.2  |
|                  | PLRE   | <i>Plagiobothrys reticulatus</i>                        | 20  | 0.2  | 0.2 | 0.2  |
|                  | LOCO6  | <i>Lotus corniculatus</i>                               | 20  | 0.2  | 0.2 | 0.2  |
|                  | GAAP2  | <i>Galium aparine</i>                                   | 20  | 0.2  | 0.2 | 0.2  |
|                  | FRCH   | <i>Fragaria chiloensis</i>                              | 20  | 0.2  | 0.2 | 0.2  |
|                  | CEGL2  | <i>Cerastium glomeratum</i>                             | 20  | 0.2  | 0.2 | 0.2  |
|                  | CADE8  | <i>Carex densa</i>                                      | 20  | 0.2  | 0.2 | 0.2  |
|                  | LOHU2  | <i>Lotus humistratus</i>                                | 20  | 0.2  | 0.2 | 0.2  |
|                  | LOUNU  | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i>    | 20  | 0.2  | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Noteworthy Taxa**

*Agrostis blasdalei*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

**Noteworthy Taxa, continued**

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

*Horkelia marinensis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

*Sidalcea malviflora* ssp. *purpurea*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1/S1

***Deschampsia cespitosa* – *Holcus lanatus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (6), Coastal Hills-Santa Rosa Plain/263Aj (12) USDA Ecological Subsection(s) (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 85.6         | 60–95 <sup>1</sup> | –          |
| <b>Herb</b>                          | 80.5         | 35–98              | –          |
| <b>Shrub</b>                         | 4.0          | 0–20               | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (4), SE (6), SW (7)

**Macrotopography:** lower 1/3 of slope (9), middle 1/3 of slope (5), upper 1/3 of slope (4)

**Microtopography:** flat (15), undulating (3), wet (1)

**Parent material:** metasedimentary (10), mixed rock (1), sedimentary (7)

**Soil texture:** clay or clay loam (16), loam or sandy loam (1), silt or silt loam (1)

**Slope steepness:** flat/0° (1), gentle/1-5° (6), moderate/6-25° (11)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 268 ft. | 57–602 ft. |
| <b>Slope</b>             | 8.0°    | 0–17°      |
| <b>Large rock cover</b>  | 1.6%    | 0–30%      |
| <b>Small rock cover</b>  | 1.3%    | 0–20%      |
| <b>Bare ground cover</b> | 2.6%    | 0–15%      |
| <b>Litter cover</b>      | 75.4%   | 25–89%     |

**Samples Used to Describe Association (n=19)**

**Rapid Assessments:** none

**Relevés:** HEAD0017, HEAD0019, HEAD0055, HEAD0092, HEAD0103, HEAD0110, HEAD0191, HEAD0195, HEAD0196, HEAD0200, HEAD0201, HEAD0203, HEAD0209, HEAD0259, HEAD0299, HEAD0328, HEAD0339, HEAD0340, HEAD0390

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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SCV Global/State Rank: G3?/S3?¹

**STAND TABLE**

***Deschampsia cespitosa* – *Holcus lanatus* Provisional Association**

n = 19

| Lifeform                               | Code  | Botanical Name                 | Con | Avg  | Min | Max  |
|--|-------|--------------------------------|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |       |                                |     |      |     |      |
|  | PSME  | <i>Pseudotsuga menziesii</i>   | 21  | 1.6  | 0.1 | 3.0  |
| <b>Shrub</b>                           |       |                                |     |      |     |      |
|  | RUUR  | <i>Rubus ursinus</i>           | 74  | 3.9  | 0.2 | 8.0  |
|  | BAPI  | <i>Baccharis pilularis</i>     | 47  | 3.5  | 0.2 | 8.0  |
| <b>Herb</b>                            |       |                                |     |      |     |      |
|  | HOLA  | <i>Holcus lanatus</i>          | 100 | 29.8 | 3.0 | 68.0 |
|  | DECE  | <i>Deschampsia cespitosa</i>   | 100 | 28.0 | 8.0 | 68.0 |
|  | PLLA  | <i>Plantago lanceolata</i>     | 84  | 2.3  | 0.2 | 18.0 |
|  | SIBE  | <i>Sisyrinchium bellum</i>     | 79  | 1.1  | 0.2 | 8.0  |
|  | ANAR  | <i>Anagallis arvensis</i>      | 79  | 0.2  | 0.2 | 0.2  |
|  | CIVU  | <i>Cirsium vulgare</i>         | 79  | 0.2  | 0.1 | 0.2  |
|  | IRDO  | <i>Iris douglasiana</i>        | 74  | 10.8 | 0.2 | 38.0 |
|  | VUBR  | <i>Vulpia bromoides</i>        | 74  | 3.1  | 0.2 | 8.0  |
|  | HYRA3 | <i>Hypochaeris radicata</i>    | 74  | 0.6  | 0.1 | 3.0  |
|  | DACA3 | <i>Danthonia californica</i>   | 68  | 2.3  | 0.2 | 8.0  |
|  | GEDI  | <i>Geranium dissectum</i>      | 68  | 0.6  | 0.2 | 3.0  |
|  | RUAC3 | <i>Rumex acetosella</i>        | 63  | 0.7  | 0.2 | 3.0  |
|  | VISA  | <i>Vicia sativa</i>            | 63  | 0.2  | 0.2 | 0.2  |
|  | LIBI5 | <i>Linum bienne</i>            | 63  | 0.2  | 0.1 | 0.2  |
|  | CAGY3 | <i>Carex gynodynamis</i>       | 58  | 3.9  | 0.2 | 8.0  |
|  | CATU3 | <i>Carex tumulicola</i>        | 58  | 3.7  | 0.2 | 18.0 |
|  | BRCA5 | <i>Bromus carinatus</i>        | 58  | 1.9  | 0.2 | 8.0  |
|  | BRMI2 | <i>Briza minor</i>             | 58  | 0.5  | 0.2 | 3.0  |
|  | AICA  | <i>Aira caryophylla</i>        | 58  | 0.2  | 0.2 | 0.2  |
|  | SOAS  | <i>Sonchus asper</i>           | 58  | 0.2  | 0.1 | 0.2  |
|  | ELGL  | <i>Elymus glaucus</i>          | 53  | 3.2  | 0.2 | 8.0  |
|  | BRMA  | <i>Briza maxima</i>            | 47  | 2.5  | 0.1 | 8.0  |
|  | JUPA2 | <i>Juncus patens</i>           | 47  | 0.8  | 0.2 | 3.0  |
|  | 2DAPI | <i>Danthonia pilosa</i>        | 42  | 2.3  | 0.2 | 3.0  |
|  | CYEC  | <i>Cynosurus echinatus</i>     | 42  | 1.9  | 0.2 | 8.0  |
|  | MYDI  | <i>Myosotis discolor</i>       | 42  | 1.5  | 0.2 | 8.0  |
|  | LOFO2 | <i>Lotus formosissimus</i>     | 42  | 0.2  | 0.1 | 0.2  |
|  | JUBU  | <i>Juncus bufonius</i>         | 37  | 2.1  | 0.2 | 8.0  |
|  | JUOC2 | <i>Juncus occidentalis</i>     | 37  | 1.3  | 0.1 | 8.0  |
|  | BRHO2 | <i>Bromus hordeaceus</i>       | 37  | 0.2  | 0.2 | 0.2  |
|  | LUCO6 | <i>Luzula comosa</i>           | 37  | 0.2  | 0.2 | 0.2  |
|  | ANOD  | <i>Anthoxanthum odoratum</i>   | 32  | 12.5 | 0.2 | 38.0 |
|  | LETA  | <i>Leontodon taraxacoides</i>  | 32  | 3.6  | 0.2 | 18.0 |
|  | LOPE  | <i>Lolium perenne</i>          | 32  | 3.3  | 0.2 | 8.0  |
|  | NAPU4 | <i>Nassella pulchra</i>        | 32  | 1.5  | 0.2 | 8.0  |
|  | RACA2 | <i>Ranunculus californicus</i> | 32  | 0.2  | 0.2 | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Deschampsia cespitosa* – *Holcus lanatus* Provisional Association**

n = 19

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | LOAN2       | <i>Lotus angustissimus</i>                        | 26         | 2.3        | 0.2        | 8.0        |
|                 | ACMI2       | <i>Achillea millefolium</i>                       | 26         | 1.3        | 0.2        | 3.0        |
|                 | FRCH        | <i>Fragaria chiloensis</i>                        | 26         | 0.8        | 0.2        | 3.0        |
|                 | CAREX       | <i>Carex</i>                                      | 21         | 1.8        | 0.2        | 3.2        |
|                 | ACPIC2      | <i>Acaena pinnatifida</i> var. <i>californica</i> | 21         | 0.2        | 0.2        | 0.2        |
|                 | SYMPH4      | <i>Symphyotrichum</i>                             | 21         | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>                              | 21         | 0.2        | 0.2        | 0.2        |
|                 | STAJ        | <i>Stachys ajugoides</i>                          | 21         | 0.2        | 0.2        | 0.2        |
|                 | TRDU2       | <i>Trifolium dubium</i>                           | 21         | 0.2        | 0.2        | 0.2        |
|                 | CAPY2       | <i>Carduus pycnocephalus</i>                      | 21         | 0.2        | 0.1        | 0.2        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>                   | 21         | 0.2        | 0.1        | 0.2        |

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## ***Distichlis spicata* Alliance**

### **Salt grass flats**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Distichlis spicata* is dominant or co-dominant in the herbaceous layer with *Agrostis viridis*, *Ambrosia chamissonis*, *Anemopsis californica*, *Atriplex prostrata*, *Batis maritima*, *Bromus diandrus*, *Cotula coronopifolia*, *Eleocharis palustris*, *Frankenia salina*, *Hordeum brachyantherum*, *Hordeum murinum*, *Jaumea carnosa*, *Juncus arcticus*, *Juncus cooperi*, *Lepidium latifolium*, *Leymus triticoides*, *Limonium californicum*, *Muhlenbergia asperifolia*, *Parapholis strigosa*, *Pascopyrum smithii*, *Poa secunda*, *Puccinellia nuttalliana*, *Sarcocornia pacifica*, *Sporobolus airoides*, and *Triglochin maritima*. Emergent shrubs may be present at low cover, including *Allenrolfea occidentalis*, *Atriplex* spp., *Ericameria albida*, *Ericameria nauseosa*, *Sarcobatus vermiculatus*, or *Suaeda moquinii*.

The alliance is commonly found in alkaline or saline environments from the coast to the mountains and deserts of California. Zedler et al. (1999) stated that elevation profiles and vegetation patterns do not always correlate with discrete zonation in coastal marshes, but they recognize three habitats: high marsh, marsh plain, cord grass. *Distichlis spicata* vegetation types are part of the marsh plain habitat.

#### Sonoma County

Sampled *Distichlis spicata* stands are limited to estuarine salt marsh margins, one in the extreme southeast corner of the county near San Pablo Bay and the other near Estero Americano between Tomales Bay and Bodega Bay.

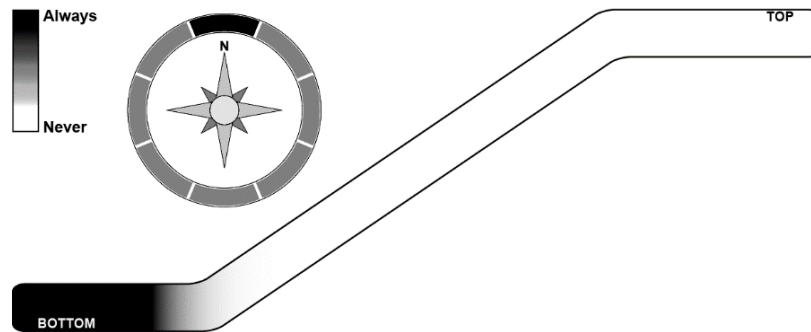
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### **Local Alliance Summary (n = 2)**

**Elevation:** 6–10 ft, mean 8 ft

**SCV Global/State Rank:** G5/S4<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 72.5         | 65–80         | –          |
| Herb                          | 72.5         | 65–80         | <0.5–0.5   |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 0.5°  | 0–1°   |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.0%  | 0–0%   |
| Bare ground cover | 41.5% | 2–81%  |
| Litter cover      | 55.5% | 15–96% |

**Associations within this Alliance:**

*Distichlis spicata* – *Frankenia salina* – *Jaumea carnosa* Association

**STAND TABLE**

***Distichlis spicata* Alliance**

n = 2

| Lifeform | Code   | Botanical Name              | Con | Avg  | Min  | Max  |
|----------|--------|-----------------------------|-----|------|------|------|
| Herb     |        |                             |     |      |      |      |
|          | DISP   | <i>Distichlis spicata</i>   | 100 | 27.5 | 10.0 | 45.0 |
|          | FRSA   | <i>Frankenia salina</i>     | 100 | 7.6  | 0.2  | 15.0 |
|          | JACA4  | <i>Jaumea carnosa</i>       | 50  | 10.0 | 10.0 | 10.0 |
|          | SAPA30 | <i>Sarcocornia pacifica</i> | 50  | 5.0  | 5.0  | 5.0  |
|          | BRDI3  | <i>Bromus diandrus</i>      | 50  | 1.0  | 1.0  | 1.0  |
|          | COTUL  | <i>Cotula</i>               | 50  | 0.2  | 0.2  | 0.2  |
|          | LOPE   | <i>Lolium perenne</i>       | 50  | 0.2  | 0.2  | 0.2  |
|          | LOTUS  | <i>Lotus</i>                | 50  | 0.2  | 0.2  | 0.2  |
|          | RASA2  | <i>Raphanus sativus</i>     | 50  | 0.2  | 0.2  | 0.2  |
|          | RUMEX  | <i>Rumex</i>                | 50  | 0.2  | 0.2  | 0.2  |
|          | VISA   | <i>Vicia sativa</i>         | 50  | 0.2  | 0.2  | 0.2  |

***Distichlis spicata* – *Frankenia salina* – *Jaumea carnosa* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 65.0         | 65            | –          |
| Herb             | 65.0         | 65            | <0.5–0.5   |
| Shrub            | 0.0          | 0             | –          |

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1)  
**Macrotopography:** bottom (1)  
**Microtopography:** flat (1)  
**Parent material:** Franciscan melange (1)  
**Soil texture:** no data  
**Slope steepness:** flat/0° (1)

|                   | Mean   | Range  |
|-------------------|--------|--------|
| Elevation         | 10 ft. | 10 ft. |
| Slope             | 0.0°   | 0°     |
| Large rock cover  | 0.0%   | 0%     |
| Small rock cover  | 0.0%   | 0%     |
| Bare ground cover | 81.0%  | 81%    |
| Litter cover      | 15.0%  | 15%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO2181

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Distichlis spicata* – *Frankenia salina* – *Jaumea carnosa* Association**

n = 1

| Lifeform | Code   | Botanical Name              | Con | Avg  | Min  | Max  |
|----------|--------|-----------------------------|-----|------|------|------|
| Herb     | DISP   | <i>Distichlis spicata</i>   | 100 | 45.0 | 45.0 | 45.0 |
|          | FRSA   | <i>Frankenia salina</i>     | 100 | 15.0 | 15.0 | 15.0 |
|          | JACA4  | <i>Jaumea carnosa</i>       | 100 | 10.0 | 10.0 | 10.0 |
|          | SAPA30 | <i>Sarcocornia pacifica</i> | 100 | 5.0  | 5.0  | 5.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



***Eleocharis (acicularis, macrostachya) Provisional Alliance***  
**Needle and pale spike rush marshes**

Statewide (Sawyer et al. 2009<sup>1</sup>)

Sawyer et al. (2009) treated *Eleocharis acicularis* and *E. macrostachya* in separate alliances, however a recent peer review panel of the NVC has determined that these species should be merged into a single alliance due to similar ecological conditions and overlapping species. The treatment below incorporates these new changes.

*Eleocharis acicularis* and/or *E. macrostachya* dominate or co-dominate in the herbaceous layer with *Agrostis stolonifera*, *Alopecurus geniculatus*, *Argentina egedii*, *Arnica chamissonis*, *Carex spp.*, *Damasonium californicum*, *Deschampsia danthonioides*, *Eleocharis acicularis*, *Eleocharis macrostachya*, *Epilobium pallidum*, *Epilobium pygmaeum*, *Eryngium alismifolium*, *Eryngium aristulatum*, *Eryngium castrense*, *Eryngium mathiasiae*, *Eryngium vaseyi*, *Isoetes howellii*, *Juncus arcticus*, *Juncus nevadensis*, *Lasthenia glaberrima*, *Lemna minuta*, *Lolium perenne*, *Marsilea vestita*, *Mimulus guttatus*, *Muhlenbergia filiformis*, *Nasturtium officinale*, *Navarretia intertexta*, *Navarretia leucocephala*, *Paspalum dilatatum*, *Perideridia parishii*, *Plagiobothrys mollis*, *Polygonum spp.*, *Psilocarphus oregonus*, *Ranunculus aquatilis*, *Ranunculus muricatus*, and *Trifolium wormskioldii*.

*Eleocharis acicularis* and *E. macrostachya* occur separately or together in a variety of temporarily flooded or saturated sites in California. S. Smith (1998) described stands of *E. acicularis* co-dominant with other early-seral herbs, resulting from long-term grazing and natural disturbance. However, Klein et al. (2007) found stable, vernal moist *Eleocharis acicularis* stands in locations without major disturbances. A related type is the *Eleocharis acicularis* sub-association of the *Downingia insignis* – *Psilocarphus brevissimus* Association, which is found in alkaline claypan vernal pools in the Solano–Colusa region (Barbour et al. 2007b). *Eleocharis macrostachya* grows in many seasonally flooded habitats including vernal pools, brackish marshes, ponds, shallow lakes, steam sides, and wet meadows. *Eleocharis macrostachya* stands exist throughout much of the western United States and central Great Plains at elevations from sea level to alpine in shallow wetlands with slowed water or in ponds (NatureServe 2007a, Smith et al. 2002).

Sonoma County

*Eleocharis (acicularis, macrostachya)* stands in Sonoma County are small (typically < 0.5 acre) and are localized adjacent to reservoirs, ponds, and seeps.

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**Local Alliance Summary (n = 3)**

**Elevation:** 48–1867 ft, mean 1005 ft

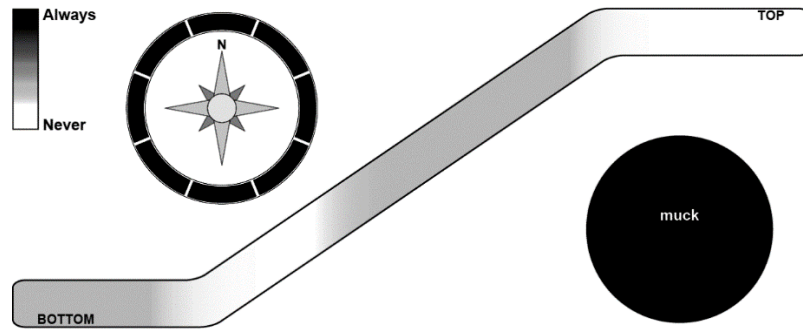
**SCV Global/State Rank:** G4/S3<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 45.3         | 16–75         | –          |
| <b>Herb</b>                          | 45.3         | 16–75         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.3°  | 0–1°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 0.0%  | 0–0%  |
| <b>Bare ground cover</b> | 31.7% | 0–93% |
| <b>Litter cover</b>      | 2.3%  | 0–5%  |

**Associations within this Alliance:**

*Eleocharis macrostachya* Association

**STAND TABLE**

***Eleocharis (acicularis, macrostachya)* Provisional Alliance**

n = 3

| Lifeform    | Code   | Botanical Name                 | Con | Avg  | Min  | Max  |
|-------------|--------|--------------------------------|-----|------|------|------|
| <b>Herb</b> |        |                                |     |      |      |      |
|             | ELMA5  | <i>Eleocharis macrostachya</i> | 67  | 57.5 | 42.0 | 73.0 |
|             | ELEOC  | <i>Eleocharis</i>              | 33  | 10.0 | 10.0 | 10.0 |
|             | ALGE2  | <i>Alopecurus geniculatus</i>  | 33  | 6.0  | 6.0  | 6.0  |
|             | MEPU   | <i>Mentha pulegium</i>         | 33  | 3.0  | 3.0  | 3.0  |
|             | CATU3  | <i>Carex tumulicola</i>        | 33  | 2.0  | 2.0  | 2.0  |
|             | JUPA2  | <i>Juncus patens</i>           | 33  | 2.0  | 2.0  | 2.0  |
|             | BRSC   | <i>Brasenia schreberi</i>      | 33  | 0.2  | 0.2  | 0.2  |
|             | CAPR5  | <i>Carex praegracilis</i>      | 33  | 0.2  | 0.2  | 0.2  |
|             | CYER   | <i>Cyperus eragrostis</i>      | 33  | 0.2  | 0.2  | 0.2  |
|             | JUPH   | <i>Juncus phaeocephalus</i>    | 33  | 0.2  | 0.2  | 0.2  |
|             | POA    | <i>Poa</i>                     | 33  | 0.2  | 0.2  | 0.2  |
|             | POLYG4 | <i>Polygonum</i>               | 33  | 0.2  | 0.2  | 0.2  |

**STAND TABLE** continued

***Eleocharis (acicularis, macrostachya)* Provisional Alliance**

n = 3

| Lifeform            | Code  | Botanical Name       | Con | Avg | Min | Max |
|---------------------|-------|----------------------|-----|-----|-----|-----|
| <b>Herb</b>         |       |                      |     |     |     |     |
|                     | RORIP | <i>Rorippa</i>       | 33  | 0.2 | 0.2 | 0.2 |
|                     | RUMEX | <i>Rumex</i>         | 33  | 0.2 | 0.2 | 0.2 |
|                     | RUCR  | <i>Rumex crispus</i> | 33  | 0.2 | 0.2 | 0.2 |
|                     | TYPHA | <i>Typha</i>         | 33  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |       |                      |     |     |     |     |
|                     | 2ALGA | Alga                 | 33  | 0.2 | 0.2 | 0.2 |

***Eleocharis macrostachya* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 45–75         | –          |
| <b>Herb</b>                          | 60.0         | 45–75         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), variable (1)  
**Macrotopography:** bottom (1), upper 1/3 of slope (1)  
**Microtopography:** concave (1), flat (1)  
**Parent material:** sandstone (2)  
**Soil texture:** no data  
**Slope steepness:** flat/0° (1), gentle/1-5° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 574 ft. | 48–1099 ft. |
| <b>Slope</b>             | 0.5°    | 0–1°        |
| <b>Large rock cover</b>  | 0.0%    | 0–0%        |
| <b>Small rock cover</b>  | 0.0%    | 0–0%        |
| <b>Bare ground cover</b> | 47.5%   | 2–93%       |
| <b>Litter cover</b>      | 3.5%    | 2–5%        |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0756  
**Relevés:** SONO0750

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
 Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Eleocharis macrostachya* Association**

n = 2

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                |            |            |            |            |
|                 | ELMA5       | <i>Eleocharis macrostachya</i> | 100        | 57.5       | 42.0       | 73.0       |
|                 | ALGE2       | <i>Alopecurus geniculatus</i>  | 50         | 6.0        | 6.0        | 6.0        |
|                 | MEPU        | <i>Mentha pulegium</i>         | 50         | 3.0        | 3.0        | 3.0        |
|                 | TYPHA       | <i>Typha</i>                   | 50         | 0.2        | 0.2        | 0.2        |
|                 | CYER        | <i>Cyperus eragrostis</i>      | 50         | 0.2        | 0.2        | 0.2        |
|                 | RUMEX       | <i>Rumex</i>                   | 50         | 0.2        | 0.2        | 0.2        |
|                 | POLYG4      | <i>Polygonum</i>               | 50         | 0.2        | 0.2        | 0.2        |
|                 | RORIP       | <i>Rorippa</i>                 | 50         | 0.2        | 0.2        | 0.2        |
|                 | BRSC        | <i>Brasenia schreberi</i>      | 50         | 0.2        | 0.2        | 0.2        |
|                 | JUPH        | <i>Juncus phaeocephalus</i>    | 50         | 0.2        | 0.2        | 0.2        |
|                 | POA         | <i>Poa</i>                     | 50         | 0.2        | 0.2        | 0.2        |

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***Elymus (elymoides, multisetus) Provisional Alliance***  
**Squirreltail patches**

Statewide (Sawyer et al. 2009)

*Elymus elymoides* or *E. multisetus* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Avena barbata*, *Bromus rubens*, *Chlorogalum pomeridianum*, *Cryptantha flaccida*, *Eschscholzia californica*, *Lasthenia californica*, *Lolium perenne*, *Lotus humistratus*, *Melica torreyana*, *Nassella pulchra*, and *Plantago erecta*.

*Elymus multisetus* grows throughout the state under a wide range of ecological and topographical conditions. Both *Elymus multisetus* and *E. elymoides* are small bunch grasses adapted to relatively dry settings throughout much of the Western US. They tend to occur on well drained rocky soils and both appear commonly on serpentine in California.

Sonoma County

Virtually all sampled stands occurred on rocky serpentine soils. Adjacent stands on better developed soils were commonly *Nassella* spp. – *Melica* spp. Alliance. In some cases, adjacent rockier stands were *Quercus durata* serpentine chaparral.

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**Local Alliance Summary (n = 8)**

**Elevation:** 619–2344 ft, mean 1059 ft

**SCV Global/State Rank:** G4?/S4?<sup>1</sup>

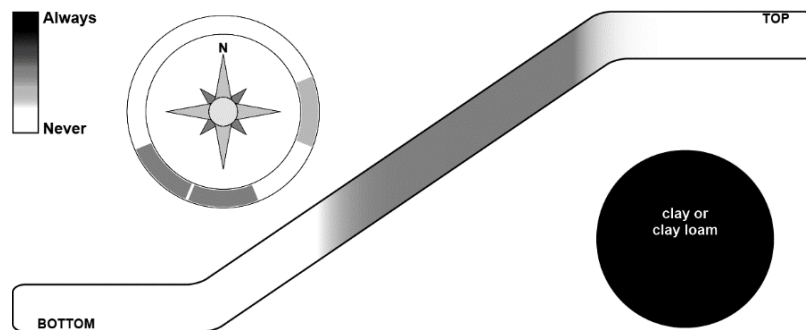
**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 20.6         | 5–45          | –          |
| <b>Herb</b>                          | 20.6         | 5–45          | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 21.9° | 14–36° |
| <b>Large rock cover</b>  | 9.6%  | 0–19%  |
| <b>Small rock cover</b>  | 43.6% | 16–69% |
| <b>Bare ground cover</b> | 34.6% | 10–72% |
| <b>Litter cover</b>      | 10.4% | 1–28%  |

**Associations within this Alliance:**

*Elymus multisetus* – (*Eschscholzia californica* – *Plantago erecta*) Provisional Association

**STAND TABLE**

***Elymus (elymoides, multisetus)* Provisional Alliance**

n = 8

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     |        |  |     |      |     |      |
|          | LOHU2  | <i>Lotus humistratus</i>                             | 88  | 0.7  | 0.2 | 2.0  |
|          | ELMU3  | <i>Elymus multisetus</i>                             | 75  | 10.5 | 4.0 | 22.0 |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 75  | 2.9  | 0.2 | 10.0 |
|          | AVBA   | <i>Avena barbata</i>                                 | 75  | 0.6  | 0.2 | 2.0  |
|          | PLER3  | <i>Plantago erecta</i>                               | 63  | 1.0  | 0.2 | 4.0  |
|          | MIDO3  | <i>Minuartia douglasii</i>                           | 63  | 0.4  | 0.2 | 1.0  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 63  | 0.2  | 0.2 | 0.2  |
|          | ERNU3  | <i>Eriogonum nudum</i>                               | 50  | 4.1  | 0.2 | 15.0 |
|          | VUMI   | <i>Vulpia microstachys</i>                           | 50  | 1.1  | 0.2 | 3.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 50  | 0.6  | 0.2 | 1.0  |
|          | GITR2  | <i>Gilia tricolor</i>                                | 38  | 1.1  | 0.2 | 3.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 38  | 0.5  | 0.2 | 1.0  |
|          | ANFI3  | <i>Ancistrocarphus filagineus</i>                    | 38  | 0.2  | 0.2 | 0.2  |
|          | CACI2  | <i>Calandrinia ciliata</i>                           | 38  | 0.2  | 0.2 | 0.2  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 38  | 0.2  | 0.2 | 0.2  |
|          | LACA7  | <i>Lasthenia californica</i>                         | 38  | 0.2  | 0.2 | 0.2  |
|          | TRAL5  | <i>Trifolium albopurpureum</i>                       | 38  | 0.2  | 0.2 | 0.2  |
|          | CHLOR3 | <i>Chlorogalum</i>                                   | 25  | 1.5  | 1.0 | 2.0  |
|          | ERLUL  | <i>Eriogonum luteolum</i> var. <i>luteolum</i>       | 25  | 1.5  | 1.0 | 2.0  |
|          | LOPE   | <i>Lolium perenne</i>                                | 25  | 1.1  | 0.2 | 2.0  |
|          | AGOSE  | <i>Agoseris</i>                                      | 25  | 0.2  | 0.2 | 0.2  |
|          | BRELE  | <i>Brodiaea elegans</i> ssp. <i>elegans</i>          | 25  | 0.2  | 0.2 | 0.2  |
|          | CRSE11 | <i>Croton setigerus</i>                              | 25  | 0.2  | 0.2 | 0.2  |
|          | ERIOG  | <i>Eriogonum</i>                                     | 25  | 0.2  | 0.2 | 0.2  |
|          | HECO7  | <i>Hemizonia congesta</i>                            | 25  | 0.2  | 0.2 | 0.2  |

**STAND TABLE** continued

***Elymus (elymoides, multisetus)* Provisional Alliance**

n = 8

| Lifeform            | Code  | Botanical Name                  | Con | Avg | Min | Max |
|---------------------|-------|---------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |       |                                 |     |     |     |     |
|                     | LASA  | <i>Lactuca saligna</i>          | 25  | 0.2 | 0.2 | 0.2 |
|                     | NAPU4 | <i>Nassella pulchra</i>         | 25  | 0.2 | 0.2 | 0.2 |
|                     | STGL8 | <i>Streptanthus glandulosus</i> | 25  | 0.2 | 0.2 | 0.2 |
|                     | TRIFO | <i>Trifolium</i>                | 25  | 0.2 | 0.2 | 0.2 |
| <b>Non-vascular</b> |       |                                 |     |     |     |     |
|                     | 2MOSS | Moss                            | 25  | 2.6 | 0.2 | 5.0 |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G5T1T2/S1S2

***Elymus multisetus* – (*Eschscholzia californica* – *Plantago erecta*) Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Franciscan/263Ag (6) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 21.0         | 5–45          | –          |
| <b>Herb</b>                          | 21.0         | 5–45          | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SE (2), SW (4)  
**Macrotopography:** middle 1/3 of slope (4), middle to upper 1/3 of slope (1), upper 1/3 of slope (1)  
**Microtopography:** convex (5), undulating (1)  
**Parent material:** Franciscan melange (1), serpentine (6)  
**Soil texture:** clay or clay loam (2)  
**Slope steepness:** moderate/6–25° (5), steep/>25° (2)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1090 ft. | 619–2344 ft. |
| <b>Slope</b>             | 22.6°    | 14–36°       |
| <b>Large rock cover</b>  | 11.0%    | 1–19%        |
| <b>Small rock cover</b>  | 46.3%    | 16–69%       |
| <b>Bare ground cover</b> | 29.3%    | 10–40%       |
| <b>Litter cover</b>      | 11.7%    | 3–28%        |

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**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** SONO2206

**Relevés:** SONO0350, SONO0357, SONO0535, SONO0923, SONO0926, SONO0934

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Elymus multisetus* – (*Eschscholzia californica* – *Plantago erecta*) Provisional Association**

n = 7

| Lifeform            | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|---------------------|--------|--|-----|------|-----|------|
| Herb                |        |  |     |      |     |      |
|                     | ELMU3  | <i>Elymus multisetus</i>                             | 86  | 10.5 | 4.0 | 22.0 |
|                     | LOHU2  | <i>Lotus humistratus</i>                             | 86  | 0.8  | 0.2 | 2.0  |
|                     | ESCA2  | <i>Eschscholzia californica</i>                      | 71  | 3.4  | 0.2 | 10.0 |
|                     | PLER3  | <i>Plantago erecta</i>                               | 71  | 1.0  | 0.2 | 4.0  |
|                     | AVBA   | <i>Avena barbata</i>                                 | 71  | 0.7  | 0.2 | 2.0  |
|                     | VUMI   | <i>Vulpia microstachys</i>                           | 57  | 1.1  | 0.2 | 3.0  |
|                     | MIDO3  | <i>Minuartia douglasii</i>                           | 57  | 0.4  | 0.2 | 1.0  |
|                     | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 57  | 0.2  | 0.2 | 0.2  |
|                     | ERNU3  | <i>Eriogonum nudum</i>                               | 43  | 5.1  | 0.2 | 15.0 |
|                     | GITR2  | <i>Gilia tricolor</i>                                | 43  | 1.1  | 0.2 | 3.0  |
|                     | BRHO2  | <i>Bromus hordeaceus</i>                             | 43  | 0.5  | 0.2 | 1.0  |
|                     | SIBE   | <i>Sisyrinchium bellum</i>                           | 43  | 0.5  | 0.2 | 1.0  |
|                     | CACI2  | <i>Calandrinia ciliata</i>                           | 43  | 0.2  | 0.2 | 0.2  |
|                     | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 43  | 0.2  | 0.2 | 0.2  |
|                     | ANFI3  | <i>Ancistrocarphus filagineus</i>                    | 43  | 0.2  | 0.2 | 0.2  |
|                     | ERLUL  | <i>Eriogonum luteolum</i> var. <i>luteolum</i>       | 29  | 1.5  | 1.0 | 2.0  |
|                     | CHLOR3 | <i>Chlorogalum</i>                                   | 29  | 1.5  | 1.0 | 2.0  |
|                     | LOPE   | <i>Lolium perenne</i>                                | 29  | 1.1  | 0.2 | 2.0  |
|                     | TRAL5  | <i>Trifolium albopurpureum</i>                       | 29  | 0.2  | 0.2 | 0.2  |
|                     | AGOSE  | <i>Agoseris</i>                                      | 29  | 0.2  | 0.2 | 0.2  |
|                     | CRSE11 | <i>Croton setigerus</i>                              | 29  | 0.2  | 0.2 | 0.2  |
|                     | ERIOG  | <i>Eriogonum</i>                                     | 29  | 0.2  | 0.2 | 0.2  |
|                     | HECO7  | <i>Hemizonia congesta</i>                            | 29  | 0.2  | 0.2 | 0.2  |
|                     | LASA   | <i>Lactuca saligna</i>                               | 29  | 0.2  | 0.2 | 0.2  |
|                     | LACA7  | <i>Lasthenia californica</i>                         | 29  | 0.2  | 0.2 | 0.2  |
|                     | TRIFO  | <i>Trifolium</i>                                     | 29  | 0.2  | 0.2 | 0.2  |
| <b>Non-vascular</b> |        |  |     |      |     |      |
|                     | 2MOSS  | Moss   | 29  | 2.6  | 0.2 | 5.0  |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



***Elymus glaucus* – *Bromus carinatus* Provisional Alliance**  
**Blue wild rye – California brome glades**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Elymus glaucus*, *Bromus carinatus*, *Bromus maritimus*, and/or *Pteridium aquilinum* dominate or co-dominate in the herbaceous layer with *Agrostis scabra*, *Anagallis arvensis*, *Bromus diandrus*, *Calamagrostis canadensis*, *Carex feta*, *Carex pellita*, *Glyceria striata*, *Heracleum maximum*, *Juncus oxymeris*, *Phleum pratense*, *Poa pratensis*, *Senecio clarkianus*, *Senecio triangularis*, *Solidago canadensis*, *Stachys albens*, *Veratrum californicum*, and *Vulpia bromoides*.

This alliance is represented by four different taxa, *Elymus glaucus*, *Bromus carinatus*, *B. maritimus*, and *Pteridium aquilinum*, which because of their ecological relatedness, have been combined into a single alliance. *Bromus carinatus* is a mesophytic native perennial grass, which is widespread throughout the western United States. In northwest California, it occurs commonly on hills and mesic slopes away from the immediate coast. A close relative of *Bromus carinatus*, treated as a variety of it in many floras, is *B. maritimus*. It forms stands on coastal bluffs in central and northern California from Santa Cruz to Eureka, and on exposed hills of the northern Channel Islands.

*Elymus glaucus* occurs within a matrix of grasslands, coastal and montane forests, and montane woodlands throughout the western United States. It was an important component of Great Valley grasslands before the advent of heavy grazing and the invasion of non-native plants (Amme et al. 1990, Keeley 1990b), and was a dominant in southern California grasslands (Paysen et al. 1980). We include all three *Elymus glaucus* subspecies in this alliance. *E. glaucus* ssp. *glaucus* and *E. glaucus* ssp. *jepsonii*, which grow at montane elevations, and *E. glaucus* ssp. *virescens*, which is coastal.

The *Bromus carinatus* and *Pteridium aquilinum* Associations are currently known only from the northern Coast Ranges. In studies from Marin County (Evens and Kentner 2006, Buck and Evens 2010), stands dominated by *E. glaucus*, *B. carinatus*, or *P. aquilinum* were assigned to the *Elymus glaucus*, *Bromus carinatus*, or *Pteridium aquilinum* Association respectively, each within its own provisional alliance. The Marin County data was combined and re-analyzed with Sonoma County data for this report. Based on this analysis, we now recognize one alliance which contains elements of these three associations. Mixes of *Bromus carinatus* and *Elymus glaucus* with a high cover of *Pteridium* are placed in the *Pteridium aquilinum* Association. Stands composed primarily of *Bromus carinatus* or *B. maritimus* are called the *Bromus carinatus* Association. Stands with primarily *E. glaucus* and lesser amounts of *B. carinatus* and/or *P. aquilinum* are known as the *Elymus glaucus* Association.

Sonoma County

In Sonoma County, the provisional association called “*Bromus carinatus*” may be composed of either *Bromus carinatus* or *B. maritimus* (formerly *Bromus carinatus* var. *maritimus* as per the Jepson eFlora (2015)). *Bromus carinatus* Association stands occur in mesic settings, from coastal bluffs to sheltered north-facing inland slopes. These stands commonly have low cover of *Elymus glaucus*. Samples of *Bromus carinatus* or *B. maritimus* stands have been found at Bodega Head and several other sites along the coast to the north. A single inland stand occurs on a grazed and mowed north-facing slope northwest of Petaluma.

The *Elymus glaucus* Association in Sonoma County is characterized by higher cover of *Elymus glaucus* than by either taxon of *Bromus*. It is found inland in mesic settings and also occurs occasionally near the coast. Grassland stands with variable cover of *Pteridium aquilinum* and a variety of native grasses, including *Bromus carinatus* and *Elymus glaucus*, occur in mesic sites throughout the county.

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

**Local Alliance Summary (n = 31)**

**Elevation:** 45–2046 ft, mean 817 ft

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe global/state rank: G4T2T3/S2S3

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe global/state rank: G4T3/S2

*Horkelia marinensis*

CA rare plant rank: 1B.2

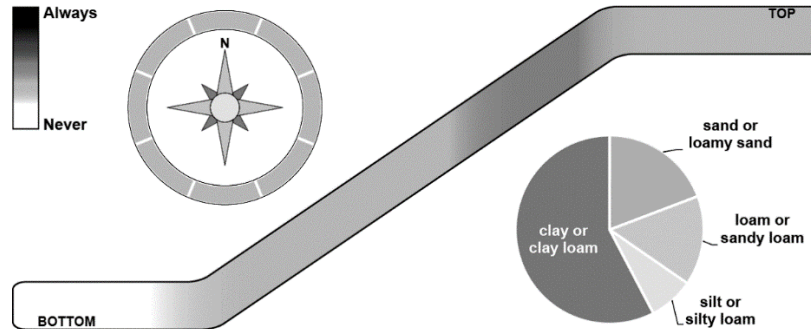
NatureServe global/state rank: G2/S2

*Layia septentrionalis*

CA rare plant rank: 1B.2

NatureServe global/state rank: G2/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 55.6         | 25–90 <sup>2</sup> | –          |
| <b>Herb</b>                          | 63.0         | 25–96              | <0.5–2     |
| <b>Shrub</b>                         | 0.7          | 0–7                | <0.5–2     |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–1                | <0.5–5     |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

<sup>2</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 12.0° | 0–36° |
| Large rock cover  | 4.1%  | 0–89% |
| Small rock cover  | 4.1%  | 0–50% |
| Bare ground cover | 13.5% | 0–70% |
| Litter cover      | 68.9% | 0–98% |

**Associations within this Alliance:**

*Bromus carinatus* Provisional Association  
*Elymus glaucus* Association  
*Pteridium aquilinum* Provisional Association

**STAND TABLE**

***Elymus glaucus* – *Bromus carinatus* Provisional Alliance**

n = 31

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     |        |  |     |      |     |      |
|          | RUAC3  | <i>Rumex acetosella</i>                          | 81  | 1.3  | 0.1 | 6.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 68  | 7.7  | 0.2 | 38.0 |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 61  | 23.3 | 0.2 | 68.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 61  | 1.7  | 0.2 | 18.0 |
|          | ELGL   | <i>Elymus glaucus</i>                            | 58  | 5.4  | 0.2 | 18.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                         | 58  | 3.7  | 0.2 | 18.0 |
|          | GEDI   | <i>Geranium dissectum</i>                        | 55  | 1.0  | 0.2 | 8.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                      | 48  | 7.8  | 0.2 | 38.0 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                       | 45  | 2.2  | 0.2 | 10.0 |
|          | BRCA5  | <i>Bromus carinatus</i>                          | 42  | 25.6 | 0.2 | 68.0 |
|          | BRMA   | <i>Briza maxima</i>                              | 42  | 7.9  | 0.2 | 68.0 |
|          | CYEC   | <i>Cynosurus echinatus</i>                       | 42  | 4.7  | 0.2 | 18.0 |
|          | AVBA   | <i>Avena barbata</i>                             | 42  | 3.6  | 0.2 | 38.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 42  | 2.2  | 0.2 | 8.0  |
|          | RACA2  | <i>Ranunculus californicus</i>                   | 42  | 0.6  | 0.1 | 3.0  |
|          | VISA   | <i>Vicia sativa</i>                              | 42  | 0.3  | 0.2 | 2.0  |
|          | DAPU3  | <i>Daucus pusillus</i>                           | 42  | 0.2  | 0.2 | 0.2  |
|          | PLLA   | <i>Plantago lanceolata</i>                       | 39  | 4.5  | 0.2 | 18.0 |
|          | AICA   | <i>Aira caryophylla</i>                          | 39  | 0.4  | 0.2 | 3.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 35  | 4.1  | 0.2 | 18.0 |
|          | LOPE   | <i>Lolium perenne</i>                            | 32  | 9.1  | 0.2 | 38.0 |
|          | STAJ   | <i>Stachys ajugoides</i>                         | 32  | 1.8  | 0.2 | 8.0  |
|          | SOAS   | <i>Sonchus asper</i>                             | 32  | 1.0  | 0.1 | 8.0  |
|          | SIGA   | <i>Silene gallica</i>                            | 32  | 0.5  | 0.1 | 3.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                        | 29  | 5.2  | 0.2 | 38.0 |
|          | HOLA   | <i>Holcus lanatus</i>                            | 26  | 21.7 | 0.2 | 68.0 |
|          | IRDO   | <i>Iris douglasiana</i>                          | 26  | 6.9  | 0.1 | 18.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                          | 26  | 1.9  | 0.2 | 5.0  |
|          | TOAR   | <i>Torilis arvensis</i>                          | 26  | 1.2  | 0.2 | 5.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                     | 26  | 1.0  | 0.2 | 4.0  |
|          | LIBI5  | <i>Linum bienne</i>                              | 26  | 0.9  | 0.2 | 3.0  |
|          | LUCO6  | <i>Luzula comosa</i>                             | 26  | 0.3  | 0.2 | 1.0  |
|          | GAAP2  | <i>Galium aparine</i>                            | 26  | 0.2  | 0.2 | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>                           | 26  | 0.2  | 0.1 | 0.2  |

**STAND TABLE** continued

***Elymus glaucus* – *Bromus carinatus* Provisional Alliance**

n = 31

| Lifeform | Code  | Botanical Name                  | Con | Avg | Min | Max  |
|----------|-------|---------------------------------|-----|-----|-----|------|
| Herb     | ESCA2 | <i>Eschscholzia californica</i> | 23  | 2.7 | 0.2 | 18.0 |
|          | CIQU2 | <i>Cirsium quercetorum</i>      | 23  | 2.2 | 0.2 | 3.0  |
|          | DIDO3 | <i>Dichondra donelliana</i>     | 23  | 0.6 | 0.2 | 3.0  |
|          | SOOL  | <i>Sonchus oleraceus</i>        | 23  | 0.2 | 0.1 | 0.2  |

**Noteworthy Taxa**

- Calystegia purpurata* ssp. *saxicola*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G4T2T3/S2S3
- Hemizonia congesta* ssp. *congesta*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G5T1T2/S1S2
- Hesperervax sparsiflora* var. *brevifolia*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G4T3/S2
- Horkelia marinensis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2
- Layia septentrionalis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2

***Bromus carinatus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (9) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 83.0         | 75–90 <sup>1</sup> | –          |
| <b>Herb</b>                          | 86.6         | 75–96              | –          |
| <b>Shrub</b>                         | 1.6          | 0–7                | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

- Aspect:** NE (4), NW (3), SE (1), SW (1)
- Macrotopography:** lower 1/3 of slope (4), middle 1/3 of slope (1), ridge top (1), upper 1/3 of slope (4)
- Microtopography:** concave (3), flat (6), undulating (1)
- Parent material:** igneous (5), metasedimentary (3), sedimentary (2)
- Soil texture:** clay or clay loam (3), loam or sandy loam (3), sand (2), silt or silt loam (2)
- Slope steepness:** flat/0° (1), gentle/1-5° (3), moderate/6-25° (6)

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

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|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 242 ft. | 45–626 ft. |
| Slope             | 8.0°    | 0–20°      |
| Large rock cover  | 0.0%    | 0–0%       |
| Small rock cover  | 3.1%    | 0–26%      |
| Bare ground cover | 11.0%   | 1–70%      |
| Litter cover      | 69.6%   | 10–98%     |

**Samples Used to Describe Association (n=10)**

**Rapid Assessments:** none

**Relevés:** HEAD0008, HEAD0009, HEAD0013, HEAD0022, HEAD0023, HEAD0108, HEAD0121, HEAD0289, HEAD0338, HEAD0349

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Bromus carinatus* Provisional Association**

n = 10

| Lifeform | Code                     | Botanical Name                               | Con | Avg  | Min | Max  |
|----------|--------------------------|--|-----|------|-----|------|
| Shrub    | RUUR                     | <i>Rubus ursinus</i>                         | 20  | 3.0  | 3.0 | 3.0  |
|          | VIAMA3                   | <i>Vicia americana</i> ssp. <i>americana</i> | 20  | 1.6  | 0.2 | 3.0  |
| Herb     | RUAC3                    | <i>Rumex acetosella</i>                      | 100 | 1.0  | 0.1 | 3.0  |
|          | BRCA5                    | <i>Bromus carinatus</i>                      | 90  | 36.9 | 8.0 | 68.0 |
|          | VUBR                     | <i>Vulpia bromoides</i>                      | 80  | 16.1 | 3.0 | 38.0 |
|          | GED1                     | <i>Geranium dissectum</i>                    | 80  | 1.9  | 0.2 | 8.0  |
|          | ANAR                     | <i>Anagallis arvensis</i>                    | 80  | 1.3  | 0.2 | 3.0  |
|          | ACMI2                    | <i>Achillea millefolium</i>                  | 70  | 5.8  | 0.2 | 18.0 |
|          | LOPE                     | <i>Lolium perenne</i>                        | 60  | 15.0 | 0.2 | 38.0 |
|          | HYRA3                    | <i>Hypochaeris radicata</i>                  | 60  | 4.1  | 0.2 | 8.0  |
|          | STAJ                     | <i>Stachys ajugoides</i>                     | 60  | 2.9  | 0.2 | 8.0  |
|          | RACA2                    | <i>Ranunculus californicus</i>               | 60  | 0.7  | 0.1 | 3.0  |
|          | DAPU3                    | <i>Daucus pusillus</i>                       | 60  | 0.2  | 0.2 | 0.2  |
|          | SOAS                     | <i>Sonchus asper</i>                         | 60  | 0.2  | 0.1 | 0.2  |
|          | IRDO                     | <i>Iris douglasiana</i>                      | 50  | 8.8  | 0.1 | 18.0 |
|          | BRHO2                    | <i>Bromus hordeaceus</i>                     | 50  | 5.4  | 0.2 | 18.0 |
|          | CIQU2                    | <i>Cirsium quercetorum</i>                   | 50  | 2.4  | 0.2 | 3.0  |
|          | SIGA                     | <i>Silene gallica</i>                        | 50  | 0.8  | 0.2 | 3.0  |
|          | VISA                     | <i>Vicia sativa</i>                          | 50  | 0.2  | 0.2 | 0.2  |
|          | SOOL                     | <i>Sonchus oleraceus</i>                     | 50  | 0.2  | 0.1 | 0.2  |
|          | LUVE                     | <i>Lupinus versicolor</i>                    | 40  | 13.0 | 3.0 | 38.0 |
|          | PLLA                     | <i>Plantago lanceolata</i>                   | 40  | 11.1 | 0.2 | 18.0 |
|          | ERGL3                    | <i>Erigeron glaucus</i>                      | 40  | 3.6  | 0.2 | 8.0  |
|          | LUCO6                    | <i>Luzula comosa</i>                         | 40  | 0.2  | 0.2 | 0.2  |
|          | HOBR2                    | <i>Hordeum brachyantherum</i>                | 40  | 0.2  | 0.2 | 0.2  |
| GAAP2    | <i>Galium aparine</i>    | 40   | 0.2 | 0.2  | 0.2 |      |
| AICA     | <i>Aira caryophyllea</i> | 40   | 0.2 | 0.2  | 0.2 |      |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Bromus carinatus* Provisional Association**

n = 10

| Lifeform<br>Herb | Code   | Botanical Name                                     | Con | Avg  | Min  | Max  |
|------------------|--------|--|-----|------|------|------|
|                  | ESCA2  | <i>Eschscholzia californica</i>                    | 30  | 6.1  | 0.2  | 18.0 |
|                  | ELGL   | <i>Elymus glaucus</i>                              | 30  | 3.7  | 0.2  | 8.0  |
|                  | BRDI3  | <i>Bromus diandrus</i>                             | 30  | 2.8  | 0.2  | 8.0  |
|                  | PLCA5  | <i>Platystemon californicus</i>                    | 30  | 2.8  | 0.2  | 8.0  |
|                  | TRDU2  | <i>Trifolium dubium</i>                            | 30  | 1.1  | 0.2  | 3.0  |
|                  | DIDO3  | <i>Dichondra donelliana</i>                        | 30  | 1.1  | 0.2  | 3.0  |
|                  | CLPEP  | <i>Claytonia perfoliata</i> ssp. <i>perfoliata</i> | 30  | 1.1  | 0.1  | 3.0  |
|                  | MASA   | <i>Madia sativa</i>                                | 30  | 0.2  | 0.2  | 0.2  |
|                  | SIBE   | <i>Sisyrinchium bellum</i>                         | 30  | 0.2  | 0.2  | 0.2  |
|                  | CEAR4  | <i>Cerastium arvense</i>                           | 30  | 0.2  | 0.2  | 0.2  |
|                  | HOLA   | <i>Holcus lanatus</i>                              | 20  | 43.0 | 18.0 | 68.0 |
|                  | CATU3  | <i>Carex tumulicola</i>                            | 20  | 5.5  | 3.0  | 8.0  |
|                  | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>   | 20  | 4.1  | 0.2  | 8.0  |
|                  | ARMAC2 | <i>Armeria maritima</i> ssp. <i>californica</i>    | 20  | 4.1  | 0.2  | 8.0  |
|                  | ERIOG  | <i>Eriogonum</i>                                   | 20  | 4.1  | 0.1  | 8.0  |
|                  | LACA7  | <i>Lasthenia californica</i>                       | 20  | 1.6  | 0.2  | 3.0  |
|                  | BRMA   | <i>Briza maxima</i>                                | 20  | 1.6  | 0.2  | 3.0  |
|                  | AVBA   | <i>Avena barbata</i>                               | 20  | 1.6  | 0.2  | 3.0  |
|                  | MYDI   | <i>Myosotis discolor</i>                           | 20  | 1.6  | 0.1  | 3.0  |
|                  | TRPU16 | <i>Triphysaria pusilla</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|                  | BRMI2  | <i>Briza minor</i>                                 | 20  | 0.2  | 0.2  | 0.2  |
|                  | HYGL2  | <i>Hypochaeris glabra</i>                          | 20  | 0.2  | 0.2  | 0.2  |
|                  | PLER3  | <i>Plantago erecta</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|                  | POTEN  | <i>Potentilla</i>                                  | 20  | 0.2  | 0.2  | 0.2  |
|                  | SIMA2  | <i>Sidalcea malviflora</i>                         | 20  | 0.2  | 0.2  | 0.2  |
|                  | STME2  | <i>Stellaria media</i>                             | 20  | 0.2  | 0.2  | 0.2  |
|                  | COMA2  | <i>Conium maculatum</i>                            | 20  | 0.2  | 0.2  | 0.2  |
|                  | TRBA   | <i>Trifolium barbigerum</i>                        | 20  | 0.2  | 0.2  | 0.2  |
|                  | TRBI   | <i>Trifolium bifidum</i>                           | 20  | 0.2  | 0.2  | 0.2  |
|                  | TRMA2  | <i>Trifolium macraei</i>                           | 20  | 0.2  | 0.1  | 0.2  |
|                  | CIVU   | <i>Cirsium vulgare</i>                             | 20  | 0.2  | 0.1  | 0.2  |

**Noteworthy Taxa**

- Calystegia purpurata* ssp. *saxicola*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G4T2T3/S2S3
- Hemizonia congesta* ssp. *congesta*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G5T1T2/S1S2
- Hesperevax sparsiflora* var. *brevifolia*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G4T3/S2
- Horkelia marinensis*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G2/S2

**Noteworthy Taxa, continued**

*Layia septentrionalis*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G2/S2

***Elymus glaucus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Franciscan/263Ag (5) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 38.7         | 25–65         | –          |
| <b>Herb</b>                          | 38.5         | 25–65         | <0.5–1     |
| <b>Shrub</b>                         | 0.4          | 0–2           | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), SE (2), SW (1)

**Macrotopography:** lower 1/3 of slope (1), middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (3)

**Microtopography:** concave (1), convex (4), undulating (1)

**Parent material:** Franciscan melange (3), metasedimentary (1), sedimentary (2)

**Soil texture:** clay or clay loam (5)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (4)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1009 ft. | 634–1810 ft. |
| <b>Slope</b>             | 12.5°    | 3–20°        |
| <b>Large rock cover</b>  | 0.0%     | 0–0%         |
| <b>Small rock cover</b>  | 10.8%    | 0–50%        |
| <b>Bare ground cover</b> | 13.0%    | 1–40%        |
| <b>Litter cover</b>      | 73.8%    | 30–96%       |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** MILOB101

**Relevés:** SONO0345, SONO0349, SONO0467, SONO0533, SONO0932

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Elymus glaucus* Association**

n = 6

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | ELGL   | <i>Elymus glaucus</i>                                | 100 | 10.0 | 6.0 | 18.0 |
|          | BRMA   | <i>Briza maxima</i>                                  | 83  | 4.1  | 0.2 | 15.0 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 67  | 2.8  | 0.2 | 6.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                               | 67  | 2.3  | 1.0 | 4.0  |
|          | VISA   | <i>Vicia sativa</i>                                  | 67  | 0.7  | 0.2 | 2.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 50  | 7.4  | 0.2 | 12.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 50  | 1.8  | 0.2 | 5.0  |
|          | RUAC3  | <i>Rumex acetosella</i>                              | 50  | 1.7  | 0.2 | 4.0  |
|          | RACA2  | <i>Ranunculus californicus</i>                       | 50  | 0.2  | 0.2 | 0.2  |
|          | VUBR   | <i>Vulpia bromoides</i>                              | 33  | 4.5  | 2.0 | 7.0  |
|          | CYEC   | <i>Cynosurus echinatus</i>                           | 33  | 4.1  | 0.2 | 8.0  |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>     | 33  | 4.0  | 3.0 | 5.0  |
|          | SABI3  | <i>Sanicula bipinnatifida</i>                        | 33  | 0.6  | 0.2 | 1.0  |
|          | TRMI5  | <i>Trifolium microdon</i>                            | 33  | 0.2  | 0.2 | 0.2  |
|          | TOAR   | <i>Torilis arvensis</i>                              | 33  | 0.2  | 0.2 | 0.2  |
|          | SACR2  | <i>Sanicula crassicaulis</i>                         | 33  | 0.2  | 0.2 | 0.2  |
|          | LOWR2  | <i>Lotus wrangelianus</i>                            | 33  | 0.2  | 0.2 | 0.2  |
|          | GEDI   | <i>Geranium dissectum</i>                            | 33  | 0.2  | 0.2 | 0.2  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 33  | 0.2  | 0.2 | 0.2  |
|          | GAAP2  | <i>Galium aparine</i>                                | 33  | 0.2  | 0.2 | 0.2  |

***Pteridium aquilinum* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (11) and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 52.3         | 27–90         | –          |
| <b>Herb</b>                          | 56.9         | 27–90         | <0.5–2     |
| <b>Shrub</b>                         | 0.2          | 0–2           | 0.5–2      |
| <b>Regenerating/understory tree*</b> | 0.2          | 0–1           | <0.5–5     |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (6), SE (3), SW (4)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (4), ridge top (1), upper 1/3 of slope (7), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (2), convex (4), flat (4), undulating (4)

**Parent material:** Franciscan melange (1), metamorphic (1), metasedimentary (5), mixed sedimentary (1), sandstone (1), sedimentary (2), volcanic (3)

**Soil texture:** clay or clay loam (7), sand (3)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (7), steep/>25° (4)



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|                   | Mean     | Range       |
|-------------------|----------|-------------|
| Elevation         | 1194 ft. | 75–2046 ft. |
| Slope             | 14.9°    | 2–36°       |
| Large rock cover  | 9.2%     | 0–89%       |
| Small rock cover  | 2.5%     | 0–11%       |
| Bare ground cover | 16.4%    | 0–38%       |
| Litter cover      | 65.3%    | 0–97%       |

**Samples Used to Describe Association (n=14)**

**Rapid Assessments:** SONO0278

**Relevés:** HEAD0095, HEAD0096, HEAD0193, HEAD0194, HEAD0287, HEAD0295, HEAD0391, SONO0370, SONO0373, SONO0404, SONO0470, SONO0742, SONO0929

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Pteridium aquilinum* Provisional Association**

n = 14

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 100 | 29.9 | 14.0 | 68.0 |
|          | RUAC3  | <i>Rumex acetosella</i>                          | 79  | 1.5  | 0.2  | 6.0  |
|          | CYEC   | <i>Cynosurus echinatus</i>                       | 71  | 4.5  | 0.2  | 18.0 |
|          | AVBA   | <i>Avena barbata</i>                             | 71  | 4.3  | 0.2  | 38.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 71  | 2.4  | 0.2  | 8.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                         | 71  | 1.7  | 0.2  | 8.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                      | 64  | 10.2 | 0.2  | 38.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 64  | 2.5  | 0.2  | 18.0 |
|          | ELGL   | <i>Elymus glaucus</i>                            | 57  | 2.8  | 0.2  | 8.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                       | 50  | 2.7  | 0.2  | 10.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                       | 50  | 1.3  | 0.2  | 4.0  |
|          | AICA   | <i>Aira caryophylla</i>                          | 50  | 0.6  | 0.2  | 3.0  |
|          | GEDI   | <i>Geranium dissectum</i>                        | 50  | 0.3  | 0.2  | 1.0  |
|          | BRMA   | <i>Briza maxima</i>                              | 43  | 13.2 | 1.0  | 68.0 |
|          | HYGL2  | <i>Hypochaeris glabra</i>                        | 43  | 7.6  | 0.2  | 38.0 |
|          | MAGR3  | <i>Madia gracilis</i>                            | 43  | 2.4  | 0.2  | 8.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 43  | 1.9  | 0.2  | 4.0  |
|          | TOAR   | <i>Torilis arvensis</i>                          | 43  | 1.5  | 0.2  | 5.0  |
|          | LIBI5  | <i>Linum bienne</i>                              | 43  | 1.1  | 0.2  | 3.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                     | 43  | 0.8  | 0.2  | 4.0  |
|          | DAPU3  | <i>Daucus pusillus</i>                           | 43  | 0.2  | 0.2  | 0.2  |
|          | HOLA   | <i>Holcus lanatus</i>                            | 36  | 17.4 | 0.2  | 38.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                          | 36  | 1.9  | 0.2  | 5.0  |
|          | LOMI   | <i>Lotus micranthus</i>                          | 36  | 0.2  | 0.2  | 0.2  |
|          | TRMI4  | <i>Trifolium microcephalum</i>                   | 36  | 0.2  | 0.2  | 0.2  |
|          | SIGA   | <i>Silene gallica</i>                            | 36  | 0.2  | 0.1  | 0.2  |
|          | GAPA5  | <i>Galium parisiense</i>                         | 29  | 0.9  | 0.2  | 3.0  |
|          | RACA2  | <i>Ranunculus californicus</i>                   | 29  | 0.9  | 0.2  | 2.0  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Pteridium aquilinum* Provisional Association**

n = 14

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     | VISA        | <i>Vicia sativa</i>             | 29         | 0.2        | 0.2        | 0.2        |
|                 | SHAR2       | <i>Sherardia arvensis</i>       | 29         | 0.2        | 0.2        | 0.2        |
|                 | LOPE        | <i>Lolium perenne</i>           | 29         | 0.2        | 0.2        | 0.2        |
|                 | DIDO3       | <i>Dichondra donelliana</i>     | 29         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>          | 29         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>              | 29         | 0.2        | 0.2        | 0.2        |
|                 | PHAQ        | <i>Phalaris aquatica</i>        | 21         | 6.3        | 3.0        | 8.0        |
|                 | SOAS        | <i>Sonchus asper</i>            | 21         | 2.8        | 0.2        | 8.0        |
|                 | DACA3       | <i>Danthonia californica</i>    | 21         | 2.1        | 0.2        | 3.0        |
|                 | GADI        | <i>Galium divaricatum</i>       | 21         | 1.1        | 0.2        | 3.0        |
|                 | VUMY        | <i>Vulpia myuros</i>            | 21         | 1.1        | 0.2        | 3.0        |
|                 | CRSE11      | <i>Croton setigerus</i>         | 21         | 0.8        | 0.2        | 2.0        |
|                 | LUNA3       | <i>Lupinus nanus</i>            | 21         | 0.2        | 0.2        | 0.2        |
|                 | LOGA2       | <i>Logfia gallica</i>           | 21         | 0.2        | 0.2        | 0.2        |
|                 | ESCA2       | <i>Eschscholzia californica</i> | 21         | 0.2        | 0.2        | 0.2        |
|                 | EPBR3       | <i>Epilobium brachycarpum</i>   | 21         | 0.2        | 0.2        | 0.2        |
|                 | BRCA5       | <i>Bromus carinatus</i>         | 21         | 0.2        | 0.2        | 0.2        |
|                 | AGGR        | <i>Agoseris grandiflora</i>     | 21         | 0.2        | 0.2        | 0.2        |
|                 | LUCO6       | <i>Luzula comosa</i>            | 21         | 0.2        | 0.2        | 0.2        |

**Noteworthy Taxa**

*Calystegia purpurata* ssp. *saxicola*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T2T3/S2S3

***Eriogonum (elongatum, nudum) Provisional Alliance***  
**Longstem and naked buckwheat patches**

Statewide

*Eriogonum elongatum* and/or *E. nudum* dominate or co-dominate with *Bromus diandrus*, *Bromus rubens*, *Erodium* spp., *Eriogonum vestitum*, *Eschscholzia californica*, *Hypochaeris radicata*, and *Plantago* spp.

Stands of these short lived perennial herbaceous buckwheats occupy an ecological niche that is successional between grasslands and shrublands in many parts of cismontane California. They are similar to other alliances such as *Corethrogyne filaginifolia* and *Gutierrezia californica* and are thought to be a member of a transitional group mid-way along a seral gradient between grasslands and shrublands. *Eriogonum nudum* is widespread throughout much of the state, while *E. elongatum* is found in parts of the inner South Coast Ranges and the southern Sierra Foothills.

Sonoma County

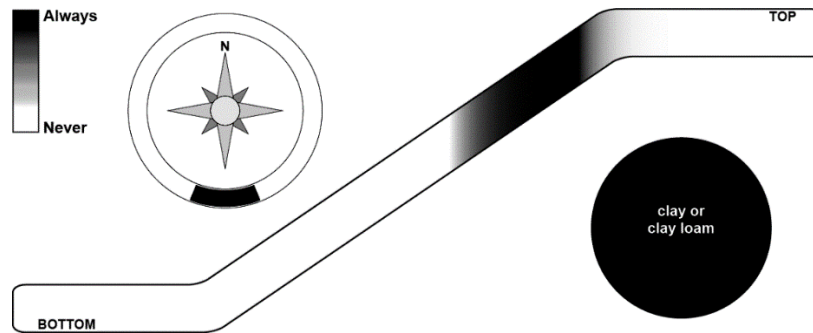
This alliance is represented by only a single sample close to the coast on a steep sedimentary outcrop surrounded by grassland. *Eriogonum nudum* probably occurs elsewhere in the county in small stands on steep slopes or road-cuts.

**Local Alliance Summary (n = 1)**

**Elevation:** 820 ft

**SCV Global/State Rank:** G3G4?/S3S4?<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 50.0         | 50            | –          |
| <b>Herb</b>                          | 50.0         | 50            | –          |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 30.0° | 30°   |
| Large rock cover  | 20.0% | 20%   |
| Small rock cover  | 10.0% | 10%   |
| Bare ground cover | 5.0%  | 5%    |
| Litter cover      | 5.0%  | 5%    |

**Associations within this Alliance:**

*Eriogonum nudum* Provisional Association

**STAND TABLE**

***Eriogonum (elongatum, nudum)* Provisional Alliance**

n = 1

| Lifeform | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Herb     | VUBR   | <i>Vulpia bromoides</i>                               | 100 | 38.0 | 38.0 | 38.0 |
|          | ERNU3  | <i>Eriogonum nudum</i>                                | 100 | 18.0 | 18.0 | 18.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                                | 100 | 8.0  | 8.0  | 8.0  |
|          | ERBO   | <i>Erodium botrys</i>                                 | 100 | 8.0  | 8.0  | 8.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                       | 100 | 8.0  | 8.0  | 8.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                           | 100 | 8.0  | 8.0  | 8.0  |
|          | PLLA   | <i>Plantago lanceolata</i>                            | 100 | 8.0  | 8.0  | 8.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                         | 100 | 8.0  | 8.0  | 8.0  |
|          | AVBA   | <i>Avena barbata</i>                                  | 100 | 3.0  | 3.0  | 3.0  |
|          | DIDO3  | <i>Dichondra donelliana</i>                           | 100 | 3.0  | 3.0  | 3.0  |
|          | HECR2  | <i>Hedypnois cretica</i>                              | 100 | 3.0  | 3.0  | 3.0  |
|          | HESEB2 | <i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | MEPO3  | <i>Medicago polymorpha</i>                            | 100 | 3.0  | 3.0  | 3.0  |
|          | MOVI2  | <i>Monardella villosa</i>                             | 100 | 3.0  | 3.0  | 3.0  |
|          | ACPIC2 | <i>Acaena pinnatifida</i> var. <i>californica</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|          | BRDI2  | <i>Brachypodium distachyon</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | CAPU18 | <i>Calystegia purpurata</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                       | 100 | 0.2  | 0.2  | 0.2  |
|          | CYEC   | <i>Cynosurus echinatus</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|          | DACA3  | <i>Danthonia californica</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|          | LOGA2  | <i>Logfia gallica</i>                                 | 100 | 0.2  | 0.2  | 0.2  |
|          | LUNA3  | <i>Lupinus nanus</i>                                  | 100 | 0.2  | 0.2  | 0.2  |
|          | NAPU4  | <i>Nassella pulchra</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|          | PLER3  | <i>Plantago erecta</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|          | RUAC3  | <i>Rumex acetosella</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|          | SIGA   | <i>Silene gallica</i>                                 | 100 | 0.2  | 0.2  | 0.2  |
|          | SPRU   | <i>Spergularia rubra</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|          | TRDU2  | <i>Trifolium dubium</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|          | TRMA2  | <i>Trifolium macraei</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                              | 100 | 0.1  | 0.1  | 0.1  |

## ***Eriogonum nudum* Provisional Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 50.0                | 50                   | –                 |
| <b>Herb</b>                          | 50.0                | 50                   | –                 |
| <b>Shrub</b>                         | 0.0                 | 0                    | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0                    | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0                    | –                 |
| <b>Conifer</b>                       | 0.0                 | 0                    | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** SW (1)

**Macrotopography:** upper 1/3 of slope (1)

**Microtopography:** convex (1)

**Parent material:** metasedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** steep/>25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 820 ft.     | 820 ft.      |
| <b>Slope</b>             | 30.0°       | 30°          |
| <b>Large rock cover</b>  | 20.0%       | 20%          |
| <b>Small rock cover</b>  | 10.0%       | 10%          |
| <b>Bare ground cover</b> | 5.0%        | 5%           |
| <b>Litter cover</b>      | 5.0%        | 5%           |

### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** HEAD0333

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

### **STAND TABLE**

#### ***Eriogonum nudum* Provisional Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>           | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                 |            |            |            |            |
|                 | VUBR        | <i>Vulpia bromoides</i>         | 100        | 38.0       | 38.0       | 38.0       |
|                 | ERNU3       | <i>Eriogonum nudum</i>          | 100        | 18.0       | 18.0       | 18.0       |
|                 | ESCA2       | <i>Eschscholzia californica</i> | 100        | 8.0        | 8.0        | 8.0        |
|                 | ERBO        | <i>Erodium botrys</i>           | 100        | 8.0        | 8.0        | 8.0        |
|                 | BRDI3       | <i>Bromus diandrus</i>          | 100        | 8.0        | 8.0        | 8.0        |
|                 | TRSU3       | <i>Trifolium subterraneum</i>   | 100        | 8.0        | 8.0        | 8.0        |
|                 | HYRA3       | <i>Hypochaeris radicata</i>     | 100        | 8.0        | 8.0        | 8.0        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Eriogonum nudum* Provisional Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                 | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | PLLA        | <i>Plantago lanceolata</i>                            | 100        | 8.0        | 8.0        | 8.0        |
|                 | MOVI2       | <i>Monardella villosa</i>                             | 100        | 3.0        | 3.0        | 3.0        |
|                 | HESEB2      | <i>Heterotheca sessiliflora</i> ssp. <i>bolanderi</i> | 100        | 3.0        | 3.0        | 3.0        |
|                 | HECR2       | <i>Hedypnois cretica</i>                              | 100        | 3.0        | 3.0        | 3.0        |
|                 | DIDO3       | <i>Dichondra donelliana</i>                           | 100        | 3.0        | 3.0        | 3.0        |
|                 | MEPO3       | <i>Medicago polymorpha</i>                            | 100        | 3.0        | 3.0        | 3.0        |
|                 | AVBA        | <i>Avena barbata</i>                                  | 100        | 3.0        | 3.0        | 3.0        |
|                 | ANAR        | <i>Anagallis arvensis</i>                             | 100        | 0.2        | 0.2        | 0.2        |
|                 | TRMA2       | <i>Trifolium macraei</i>                              | 100        | 0.2        | 0.2        | 0.2        |
|                 | TRDU2       | <i>Trifolium dubium</i>                               | 100        | 0.2        | 0.2        | 0.2        |
|                 | SPRU        | <i>Spergularia rubra</i>                              | 100        | 0.2        | 0.2        | 0.2        |
|                 | LUNA3       | <i>Lupinus nanus</i>                                  | 100        | 0.2        | 0.2        | 0.2        |
|                 | RUAC3       | <i>Rumex acetosella</i>                               | 100        | 0.2        | 0.2        | 0.2        |
|                 | DACA3       | <i>Danthonia californica</i>                          | 100        | 0.2        | 0.2        | 0.2        |
|                 | PLER3       | <i>Plantago erecta</i>                                | 100        | 0.2        | 0.2        | 0.2        |
|                 | SIGA        | <i>Silene gallica</i>                                 | 100        | 0.2        | 0.2        | 0.2        |
|                 | BRTET       | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>     | 100        | 0.2        | 0.2        | 0.2        |
|                 | NAPU4       | <i>Nassella pulchra</i>                               | 100        | 0.2        | 0.2        | 0.2        |
|                 | HYGL2       | <i>Hypochaeris glabra</i>                             | 100        | 0.2        | 0.2        | 0.2        |
|                 | CAPU18      | <i>Calystegia purpurata</i>                           | 100        | 0.2        | 0.2        | 0.2        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>                       | 100        | 0.2        | 0.2        | 0.2        |
|                 | CYEC        | <i>Cynosurus echinatus</i>                            | 100        | 0.2        | 0.2        | 0.2        |
|                 | ACPIC2      | <i>Acaena pinnatifida</i> var. <i>californica</i>     | 100        | 0.2        | 0.2        | 0.2        |
|                 | BRDI2       | <i>Brachypodium distachyon</i>                        | 100        | 0.2        | 0.2        | 0.2        |
|                 | LOGA2       | <i>Logfia gallica</i>                                 | 100        | 0.2        | 0.2        | 0.2        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                              | 100        | 0.1        | 0.1        | 0.1        |

***Eschscholzia (californica) – Lupinus (nanus) Provisional Alliance***  
**California poppy – sky lupine fields**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Eschscholzia californica*, another *Eschscholzia* species, and/or *Lupinus nanus* are characteristically abundant in the herbaceous layer with *Amsinckia menziesii*, *Avena barbata*, *Bromus* spp., *Chaenactis glabriuscula*, *Clarkia* spp., *Eriogonum* spp., *Erodium cicutarium*, *Hirschfeldia incana*, *Hypochaeris radicata*, *Lotus purshianus*, *Lupinus bicolor*, *Rumex salicifolius*, and *Vulpia myuros*. Emergent trees and shrubs may be present at low cover, including *Pinus sabiniana* or *Eriogonum fasciculatum*.

This alliance represents one of several annual herbaceous types that are widespread in the southern and central portion of cismontane California, where disturbances such as grazing, fire, occasional flooding, and slope movement are moderately frequent. The species composition of these stands appears to shift radically from year to year, depending primarily on the amount and timing of precipitation.

Stands of this alliance may include *Eschscholzia californica*, *E. lemmonii*, and *E. caespitosa*, and commonly include *Lupinus nanus*, *L. bicolor* and related taxa. Other species, especially the non-natives, may mask *Eschscholzia* and *Lupinus* abundance in some years, and competition with non-native plants is common. Robinson et al. (1995) showed that *Eschscholzia californica* competes closely with non-native *Bromus diandrus* for resources. A study by Cook (1965) suggested *E. californica* grows principally where *Avena fatua* cannot exist, as on rocky, steep sites with porous, sterile, or serpentine soils. *E. californica* is adapted to these conditions through its deep taproot and physiological tolerance to different soil conditions.

Sonoma County

Stands of the *Eschscholzia (californica) – Lupinus (nanus)* Provisional Alliance are widely scattered throughout the county, from the coast to well inland. Because both years of field sampling for this project coincided with severe drought conditions, the visual displays of these species, conspicuous in many El Niño years, was rather meager and probably reduced the number of samples that could have been collected in a more favorable spring.

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**Local Alliance Summary (n = 6)**

**Elevation:** 49–1343 ft, mean 618 ft

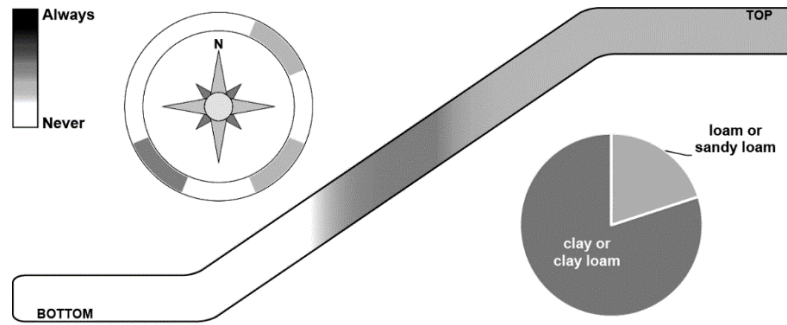
**SCV Global/State Rank:** G4/S4<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 59.3         | 30–90         | –          |
| <b>Herb</b>                          | 59.3         | 30–90         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 15.8° | 2–36° |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 7.0%  | 0–20% |
| <b>Bare ground cover</b> | 23.5% | 2–83% |
| <b>Litter cover</b>      | 44.5% | 5–84% |

**Associations within this Alliance:**

*Bromus hordeaceus* – *Lupinus nanus* – *Trifolium* spp. Association  
*Eschscholzia californica* Association

**STAND TABLE**

***Eschscholzia californica* – *Lupinus (nanus)* Provisional Alliance**

n = 6

| Lifeform    | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|-------------|--------|--|-----|------|-----|------|
| <b>Herb</b> | VUBR   | <i>Vulpia bromoides</i>                              | 67  | 15.8 | 0.2 | 38.0 |
|             | BRHO2  | <i>Bromus hordeaceus</i>                             | 67  | 12.6 | 0.2 | 40.0 |
|             | ESCA2  | <i>Eschscholzia californica</i>                      | 67  | 7.3  | 5.0 | 8.0  |
|             | AVBA   | <i>Avena barbata</i>                                 | 67  | 3.3  | 0.2 | 10.0 |
|             | RUAC3  | <i>Rumex acetosella</i>                              | 67  | 1.1  | 0.2 | 3.0  |
|             | BRDI3  | <i>Bromus diandrus</i>                               | 50  | 5.3  | 3.0 | 10.0 |
|             | PLLA   | <i>Plantago lanceolata</i>                           | 50  | 2.5  | 0.2 | 7.0  |
|             | ANAR   | <i>Anagallis arvensis</i>                            | 50  | 0.5  | 0.2 | 1.0  |
|             | BRMI2  | <i>Briza minor</i>                                   | 50  | 0.5  | 0.2 | 1.0  |
|             | GEDI   | <i>Geranium dissectum</i>                            | 50  | 0.5  | 0.2 | 1.0  |
|             | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 50  | 0.2  | 0.2 | 0.2  |



**STAND TABLE** continued

***Eschscholzia (californica) – Lupinus (nanus) Provisional Alliance***

n = 6

| Lifeform | Code  | Botanical Name                   | Con | Avg  | Min  | Max  |
|----------|-------|----------------------------------|-----|------|------|------|
| Herb     | SIGA  | <i>Silene gallica</i>            | 50  | 0.2  | 0.2  | 0.2  |
|          | LOPE  | <i>Lolium perenne</i>            | 33  | 19.1 | 0.2  | 38.0 |
|          | LUNA3 | <i>Lupinus nanus</i>             | 33  | 17.5 | 10.0 | 25.0 |
|          | ERCI6 | <i>Erodium cicutarium</i>        | 33  | 6.6  | 0.2  | 13.0 |
|          | BRDI2 | <i>Brachypodium distachyon</i>   | 33  | 6.1  | 0.2  | 12.0 |
|          | PLNO  | <i>Plagiobothrys nothofulvus</i> | 33  | 5.5  | 3.0  | 8.0  |
|          | ERBO  | <i>Erodium botrys</i>            | 33  | 3.1  | 0.2  | 6.0  |
|          | HYGL2 | <i>Hypochaeris glabra</i>        | 33  | 3.1  | 0.2  | 6.0  |
|          | LIBI5 | <i>Linum bienne</i>              | 33  | 2.6  | 0.2  | 5.0  |
|          | CHPO3 | <i>Chlorogalum pomeridianum</i>  | 33  | 2.0  | 1.0  | 3.0  |
|          | SOAS  | <i>Sonchus asper</i>             | 33  | 1.6  | 0.2  | 3.0  |
|          | DIDO3 | <i>Dichondra donelliana</i>      | 33  | 1.1  | 0.2  | 2.0  |
|          | NAPU4 | <i>Nassella pulchra</i>          | 33  | 1.1  | 0.2  | 2.0  |
|          | SHAR2 | <i>Sherardia arvensis</i>        | 33  | 1.1  | 0.2  | 2.0  |
|          | SABI3 | <i>Sanicula bipinnatifida</i>    | 33  | 0.6  | 0.2  | 1.0  |
|          | MECA2 | <i>Melica californica</i>        | 33  | 0.2  | 0.2  | 0.2  |
|          | TRIFO | <i>Trifolium</i>                 | 33  | 0.2  | 0.2  | 0.2  |

***Bromus hordeaceus – Lupinus nanus – Trifolium spp. Association***

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 67.5         | 65–70         | –          |
| Herb                          | 67.5         | 65–70         | <0.5–0.5   |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)

**Macrotopography:** middle 1/3 of slope (1), ridge top (1)

**Microtopography:** convex (1), flat (1)

**Parent material:** sandstone (1), sedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1)

|                  | Mean    | Range       |
|------------------|---------|-------------|
| Elevation        | 370 ft. | 336–403 ft. |
| Slope            | 2.0°    | 2–2°        |
| Large rock cover | 0.0%    | 0–0%        |

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|                   | Mean  | Range  |
|-------------------|-------|--------|
| Small rock cover  | 2.6%  | 0–5%   |
| Bare ground cover | 46.5% | 10–83% |
| Litter cover      | 49.5% | 15–84% |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none  
**Relevés:** SONO0225, SONO2208

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Bromus hordeaceus* – *Lupinus nanus* – *Trifolium* spp. Association**

n = 2

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     |        |  |     |      |      |      |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 100 | 20.1 | 0.2  | 40.0 |
|          | LUNA3  | <i>Lupinus nanus</i>                                 | 100 | 17.5 | 10.0 | 25.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                              | 100 | 12.5 | 5.0  | 20.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                           | 100 | 3.6  | 0.2  | 7.0  |
|          | BRMI2  | <i>Briza minor</i>                                   | 100 | 0.6  | 0.2  | 1.0  |
|          | ERBR14 | <i>Erodium brachycarpum</i>                          | 50  | 20.0 | 20.0 | 20.0 |
|          | ERCI6  | <i>Erodium cicutarium</i>                            | 50  | 13.0 | 13.0 | 13.0 |
|          | GRHI   | <i>Grindelia hirsutula</i>                           | 50  | 10.0 | 10.0 | 10.0 |
|          | AVBA   | <i>Avena barbata</i>                                 | 50  | 10.0 | 10.0 | 10.0 |
|          | HYGL2  | <i>Hypochaeris glabra</i>                            | 50  | 6.0  | 6.0  | 6.0  |
|          | LIBI5  | <i>Linum bienne</i>                                  | 50  | 5.0  | 5.0  | 5.0  |
|          | PLNO   | <i>Plagiobothrys nothofulvus</i>                     | 50  | 3.0  | 3.0  | 3.0  |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 50  | 2.0  | 2.0  | 2.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                            | 50  | 1.0  | 1.0  | 1.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 50  | 1.0  | 1.0  | 1.0  |
|          | PLER3  | <i>Plantago erecta</i>                               | 50  | 1.0  | 1.0  | 1.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                              | 50  | 1.0  | 1.0  | 1.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                           | 50  | 1.0  | 1.0  | 1.0  |
|          | JUNCU  | <i>Juncus</i>  | 50  | 0.2  | 0.2  | 0.2  |
|          | LEBI8  | <i>Leptosiphon bicolor</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 50  | 0.2  | 0.2  | 0.2  |
|          | VICIA  | <i>Vicia</i>   | 50  | 0.2  | 0.2  | 0.2  |
|          | TRIFO  | <i>Trifolium</i>                                     | 50  | 0.2  | 0.2  | 0.2  |
|          | SABI3  | <i>Sanicula bipinnatifida</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|          | RUAC3  | <i>Rumex acetosella</i>                              | 50  | 0.2  | 0.2  | 0.2  |
|          | RILE2  | <i>Rigiopappus leptocladus</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|          | LOTUS  | <i>Lotus</i>   | 50  | 0.2  | 0.2  | 0.2  |
|          | CAPU18 | <i>Calystegia purpurata</i>                          | 50  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

## ***Eschscholzia californica* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 55.3                | 30–90                | –                 |
| <b>Herb</b>                          | 55.3                | 30–90                | <0.5–0.5          |
| <b>Shrub</b>                         | 0.0                 | 0–0                  | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** NE (1), SE (1), SW (2)

**Macrotopography:** middle 1/3 of slope (2), upper 1/3 of slope (2)

**Microtopography:** convex (2), flat (2)

**Parent material:** Franciscan melange (1), igneous (1), metasedimentary (2)

**Soil texture:** clay or clay loam (3), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (2), steep/>25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 742 ft.     | 49–1343 ft.  |
| <b>Slope</b>             | 19.3°       | 2–36°        |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 10.0%       | 2–20%        |
| <b>Bare ground cover</b> | 12.0%       | 2–21%        |
| <b>Litter cover</b>      | 42.0%       | 5–75%        |

### **Samples Used to Describe Association (n=4)**

**Rapid Assessments:** none

**Relevés:** HEAD0332, HEAD0363, SONO0407, SONO0475

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

### **STAND TABLE**

#### ***Eschscholzia californica* Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Shrub</b>    | TODI        | <i>Toxicodendron diversilobum</i> | 25         | 3.0        | 3.0        | 3.0        |
|                 | BAPI        | <i>Baccharis pilularis</i>        | 25         | 3.0        | 3.0        | 3.0        |
| <b>Herb</b>     | ESCA2       | <i>Eschscholzia californica</i>   | 100        | 7.3        | 5.0        | 8.0        |
|                 | BRDI3       | <i>Bromus diandrus</i>            | 75         | 5.3        | 3.0        | 10.0       |
|                 | RUAC3       | <i>Rumex acetosella</i>           | 75         | 1.4        | 0.2        | 3.0        |
|                 | AVBA        | <i>Avena barbata</i>              | 75         | 1.1        | 0.2        | 2.0        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Eschscholzia californica* Association**

n = 4

| <b>Lifeform</b><br><b>Herb</b> | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--------------------------------|-------------|--|------------|------------|------------|------------|
|                                | GEDI        | <i>Geranium dissectum</i>                            | 75         | 0.5        | 0.2        | 1.0        |
|                                | SIGA        | <i>Silene gallica</i>                                | 75         | 0.2        | 0.2        | 0.2        |
|                                | LOPE        | <i>Lolium perenne</i>                                | 50         | 19.1       | 0.2        | 38.0       |
|                                | VUBR        | <i>Vulpia bromoides</i>                              | 50         | 19.1       | 0.2        | 38.0       |
|                                | BRDI2       | <i>Brachypodium distachyon</i>                       | 50         | 6.1        | 0.2        | 12.0       |
|                                | BRHO2       | <i>Bromus hordeaceus</i>                             | 50         | 5.1        | 0.2        | 10.0       |
|                                | ERBO        | <i>Erodium botrys</i>                                | 50         | 3.1        | 0.2        | 6.0        |
|                                | SOAS        | <i>Sonchus asper</i>                                 | 50         | 1.6        | 0.2        | 3.0        |
|                                | SHAR2       | <i>Sherardia arvensis</i>                            | 50         | 1.1        | 0.2        | 2.0        |
|                                | DIDO3       | <i>Dichondra donelliana</i>                          | 50         | 1.1        | 0.2        | 2.0        |
|                                | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 50         | 0.2        | 0.2        | 0.2        |
|                                | ANAR        | <i>Anagallis arvensis</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|                                | MECA2       | <i>Melica californica</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|                                | AMSP3       | <i>Amsinckia spectabilis</i>                         | 25         | 8.0        | 8.0        | 8.0        |
|                                | LUVE        | <i>Lupinus versicolor</i>                            | 25         | 8.0        | 8.0        | 8.0        |
|                                | PLNO        | <i>Plagiobothrys nothofulvus</i>                     | 25         | 8.0        | 8.0        | 8.0        |
|                                | COAR4       | <i>Convolvulus arvensis</i>                          | 25         | 7.0        | 7.0        | 7.0        |
|                                | BRMA        | <i>Briza maxima</i>                                  | 25         | 6.0        | 6.0        | 6.0        |
|                                | CHPO3       | <i>Chlorogalum pomeridianum</i>                      | 25         | 3.0        | 3.0        | 3.0        |
|                                | ERNU3       | <i>Eriogonum nudum</i>                               | 25         | 3.0        | 3.0        | 3.0        |
|                                | CIQU2       | <i>Cirsium quercetorum</i>                           | 25         | 3.0        | 3.0        | 3.0        |
|                                | SCCA2       | <i>Scrophularia californica</i>                      | 25         | 3.0        | 3.0        | 3.0        |
|                                | BRCA5       | <i>Bromus carinatus</i>                              | 25         | 3.0        | 3.0        | 3.0        |
|                                | PLCA5       | <i>Platystemon californicus</i>                      | 25         | 3.0        | 3.0        | 3.0        |
|                                | SABI3       | <i>Sanicula bipinnatifida</i>                        | 25         | 1.0        | 1.0        | 1.0        |
|                                | ELGL        | <i>Elymus glaucus</i>                                | 25         | 1.0        | 1.0        | 1.0        |
|                                | CAPY2       | <i>Carduus pycnocephalus</i>                         | 25         | 0.2        | 0.2        | 0.2        |
|                                | HOBR2       | <i>Hordeum brachyantherum</i>                        | 25         | 0.2        | 0.2        | 0.2        |
|                                | GAPH2       | <i>Gastroidium phleoides</i>                         | 25         | 0.2        | 0.2        | 0.2        |
|                                | ERCI6       | <i>Erodium cicutarium</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                                | EPILO       | <i>Epilobium</i>                                     | 25         | 0.2        | 0.2        | 0.2        |
|                                | DUFA        | <i>Dudleya farinosa</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                                | DAPU3       | <i>Daucus pusillus</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|                                | CRASS       | <i>Crassula</i>                                      | 25         | 0.2        | 0.2        | 0.2        |
|                                | CLPE        | <i>Claytonia perfoliata</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                                | CEGL2       | <i>Cerastium glomeratum</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                                | HYRA3       | <i>Hypochaeris radicata</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                                | CAOV4       | <i>Camissonia ovata</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                                | CACI2       | <i>Calandrinia ciliata</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                                | BRMI2       | <i>Briza minor</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                                | ANAGA       | <i>Anagallis</i>                                     | 25         | 0.2        | 0.2        | 0.2        |
|                                | AGAP2       | <i>Agoseris apargioides</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                                | ACMI2       | <i>Achillea millefolium</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                                | CHLOR3      | <i>Chlorogalum</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                                | RACA2       | <i>Ranunculus californicus</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|                                | VISA        | <i>Vicia sativa</i>                                  | 25         | 0.2        | 0.2        | 0.2        |
|                                | TRPU16      | <i>Triphysaria pusilla</i>                           | 25         | 0.2        | 0.2        | 0.2        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Eschscholzia californica* Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>         | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|-------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                               |            |            |            |            |
|                 | TRDI6       | <i>Trifolium dichotomum</i>   | 25         | 0.2        | 0.2        | 0.2        |
|                 | TRIFO       | <i>Trifolium</i>              | 25         | 0.2        | 0.2        | 0.2        |
|                 | STME2       | <i>Stellaria media</i>        | 25         | 0.2        | 0.2        | 0.2        |
|                 | STAJ        | <i>Stachys ajugoides</i>      | 25         | 0.2        | 0.2        | 0.2        |
|                 | SOOL        | <i>Sonchus oleraceus</i>      | 25         | 0.2        | 0.2        | 0.2        |
|                 | HYPE        | <i>Hypericum perforatum</i>   | 25         | 0.2        | 0.2        | 0.2        |
|                 | SCPE        | <i>Scandix pecten-veneris</i> | 25         | 0.2        | 0.2        | 0.2        |
|                 | HYGL2       | <i>Hypochaeris glabra</i>     | 25         | 0.2        | 0.2        | 0.2        |
|                 | POUN        | <i>Poa unilateralis</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                 | PLLA        | <i>Plantago lanceolata</i>    | 25         | 0.2        | 0.2        | 0.2        |
|                 | NAPU4       | <i>Nassella pulchra</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                 | MAOR3       | <i>Marah oreganus</i>         | 25         | 0.2        | 0.2        | 0.2        |
|                 | LOMI        | <i>Lotus micranthus</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                 | LOGA2       | <i>Logfia gallica</i>         | 25         | 0.2        | 0.2        | 0.2        |
|                 | LIBI5       | <i>Linum bienne</i>           | 25         | 0.2        | 0.2        | 0.2        |
|                 | POGL8       | <i>Polypodium glycyrrhiza</i> | 25         | 0.2        | 0.2        | 0.2        |
|                 | SEVU        | <i>Senecio vulgaris</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                 | SACR2       | <i>Sanicula crassicaulis</i>  | 25         | 0.2        | 0.2        | 0.2        |

## ***Festuca idahoensis* Alliance**

### **Idaho fescue grassland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Festuca idahoensis* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Anthoxanthum odoratum*, *Arrhenatherum elatius*, *Bromus carinatus*, *Carex tumulicola*, *Danthonia californica*, *Festuca rubra*, *Holcus lanatus*, *Melica californica*, *Nassella pulchra*, *Poa secunda*, and *Pteridium aquilinum*. Emergent trees and shrubs may be present at low cover.

*Festuca idahoensis* grows throughout northern California. Both of its subspecies, ssp. *idahoensis* and ssp. *roemeri* (*F. roemeri*; Wilson 2000), are found in the northwestern part of the state (Aiken et al. 2005). The National Vegetation Classification (NatureServe 2007a) recognizes a *Festuca roemeri* Alliance in Oregon and Washington, but because the ranges of the two subspecies overlap in northwestern California and the subspecies are often confused, both are included this alliance. These grasses are also easily confused with *Festuca rubra*, which also grows in northwestern California, adding further problems in identification.

*Festuca californica* is much larger than *Festuca idahoensis* and is commonly found in the understory of open oak woodlands. Under certain conditions, however, following fires or clearing, it may occur in the open near the coast. *Festuca californica* is treated within this alliance provisionally until more samples throughout its range are collected.

#### Sonoma County

*Festuca idahoensis* stands in the interior of the county are largely associated with serpentine soils. Coastward stands may be on or off serpentine. The single *Festuca californica* sample in our data set occurs on serpentine soils about 8.5 km inland from the coast, about 14 km southeast of the Russian River mouth.

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#### **Local Alliance Summary (n = 15)**

**Elevation:** 183–1292 ft, mean 760 ft

**SCV Global/State Rank:** G4/S3?<sup>2</sup>

#### **Noteworthy Taxa**

*Gilia capitata* ssp. *tomentosa*

CA rare plant rank: 1B.1

NatureServe global/state rank: G5T2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

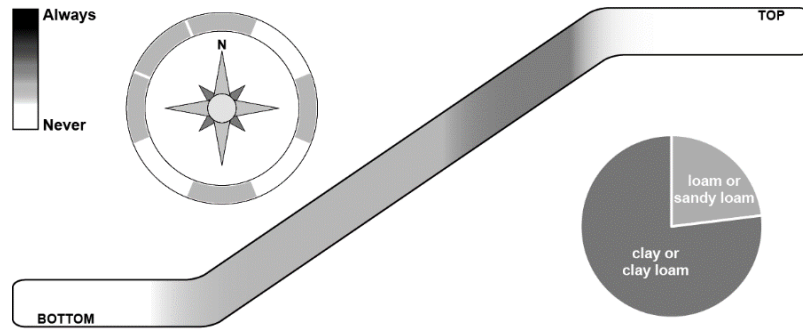
NatureServe global/state rank: G4T3/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 47.9         | 25–75 <sup>1</sup> | –          |
| <b>Herb</b>                          | 50.1         | 25–80              | <0.5–1     |
| <b>Shrub</b>                         | 0.2          | 0–2                | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2              | <0.5–1     |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.1          | 0–2                | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 16.7° | 5–30° |
| <b>Large rock cover</b>  | 9.5%  | 0–40% |
| <b>Small rock cover</b>  | 15.1% | 0–45% |
| <b>Bare ground cover</b> | 25.8% | 2–78% |
| <b>Litter cover</b>      | 34.9% | 3–81% |

**Associations within this Alliance:**

- Festuca californica* Provisional Association
- Festuca idahoensis* – *Bromus carinatus* Association
- Festuca idahoensis* – *Danthonia californica* Provisional Association
- Festuca idahoensis* Ultramafic Provisional Association

**STAND TABLE**

***Festuca idahoensis* Alliance**

n = 15

| Lifeform    | Code  | Botanical Name               | Con | Avg  | Min | Max  |
|-------------|-------|------------------------------|-----|------|-----|------|
| <b>Herb</b> |       |                              |     |      |     |      |
|             | FEID  | <i>Festuca idahoensis</i>    | 93  | 29.1 | 8.0 | 68.0 |
|             | SIBE  | <i>Sisyrinchium bellum</i>   | 73  | 2.4  | 0.2 | 18.0 |
|             | ELGL  | <i>Elymus glaucus</i>        | 67  | 2.8  | 0.2 | 8.0  |
|             | PLER3 | <i>Plantago erecta</i>       | 67  | 1.6  | 0.2 | 6.0  |
|             | DACA3 | <i>Danthonia californica</i> | 60  | 3.5  | 0.2 | 8.0  |
|             | AICA  | <i>Aira caryophyllea</i>     | 60  | 1.3  | 0.1 | 3.0  |
|             | KOMA  | <i>Koeleria macrantha</i>    | 53  | 3.8  | 0.2 | 8.0  |

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

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**STAND TABLE** continued

***Festuca idahoensis* Alliance**

n = 15

| Lifeform     | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|--------------|--------|--|-----|------|-----|------|
| Herb         | VUMI   | <i>Vulpia microstachys</i>                           | 53  | 1.3  | 0.2 | 3.2  |
|              | SABI3  | <i>Sanicula bipinnatifida</i>                        | 53  | 0.3  | 0.1 | 1.0  |
|              | NAPU4  | <i>Nassella pulchra</i>                              | 47  | 6.4  | 0.2 | 38.0 |
|              | ELMU3  | <i>Elymus multisetus</i>                             | 47  | 2.9  | 0.2 | 8.0  |
|              | ACMI2  | <i>Achillea millefolium</i>                          | 47  | 1.4  | 0.2 | 3.0  |
|              | DAPU3  | <i>Daucus pusillus</i>                               | 47  | 0.2  | 0.2 | 0.2  |
|              | LOUT   | <i>Lomatium utriculatum</i>                          | 40  | 1.1  | 0.2 | 3.0  |
|              | EPMI   | <i>Epilobium minutum</i>                             | 40  | 0.2  | 0.2 | 0.2  |
|              | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 40  | 0.2  | 0.1 | 0.2  |
|              | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i>       | 33  | 10.7 | 0.2 | 38.0 |
|              | BRHO2  | <i>Bromus hordeaceus</i>                             | 33  | 3.9  | 0.2 | 18.0 |
|              | ERLAA3 | <i>Eriophyllum lanatum</i> var. <i>arachnoideum</i>  | 33  | 2.3  | 0.2 | 8.0  |
|              | LODA   | <i>Lomatium dasycarpum</i>                           | 33  | 1.7  | 0.2 | 3.0  |
|              | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 33  | 1.3  | 0.2 | 3.0  |
|              | LOPE   | <i>Lolium perenne</i>                                | 33  | 1.3  | 0.2 | 3.0  |
|              | ESCA2  | <i>Eschscholzia californica</i>                      | 33  | 0.9  | 0.2 | 3.0  |
|              | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>  | 33  | 0.8  | 0.2 | 3.0  |
|              | MIDO3  | <i>Minuartia douglasii</i>                           | 33  | 0.7  | 0.1 | 3.0  |
|              | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 33  | 0.3  | 0.1 | 1.0  |
|              | HYRA3  | <i>Hypochaeris radicata</i>                          | 27  | 9.6  | 0.1 | 38.0 |
|              | VUBR   | <i>Vulpia bromoides</i>                              | 27  | 4.7  | 0.2 | 18.0 |
|              | MOPU2  | <i>Monardella purpurea</i>                           | 27  | 3.6  | 0.2 | 8.0  |
|              | BRCA5  | <i>Bromus carinatus</i>                              | 27  | 2.9  | 0.2 | 8.0  |
|              | IRMA   | <i>Iris macrosiphon</i>                              | 27  | 2.9  | 0.2 | 8.0  |
|              | CAMU3  | <i>Calycadenia multiglandulosa</i>                   | 27  | 2.3  | 0.2 | 3.0  |
|              | GRHI   | <i>Grindelia hirsutula</i>                           | 27  | 2.3  | 0.2 | 3.0  |
|              | LACA7  | <i>Lasthenia californica</i>                         | 27  | 2.1  | 0.1 | 8.0  |
|              | TRLA16 | <i>Triteleia laxa</i>                                | 27  | 1.8  | 0.1 | 3.0  |
|              | ERREA  | <i>Erigeron reductus</i> var. <i>angustatus</i>      | 27  | 0.9  | 0.2 | 3.0  |
|              | RACA2  | <i>Ranunculus californicus</i>                       | 27  | 0.4  | 0.2 | 1.0  |
|              | ANAR   | <i>Anagallis arvensis</i>                            | 27  | 0.2  | 0.2 | 0.2  |
|              | GICAT2 | <i>Gilia capitata</i> ssp. <i>tomentosa</i>          | 27  | 0.2  | 0.2 | 0.2  |
|              | PETR7  | <i>Pentagramma triangularis</i>                      | 27  | 0.2  | 0.1 | 0.2  |
|              | ERNU3  | <i>Eriogonum nudum</i>                               | 20  | 2.8  | 0.2 | 8.0  |
|              | CALYS  | <i>Calystegia</i>                                    | 20  | 1.4  | 0.1 | 3.0  |
|              | CASUF2 | <i>Castilleja subinclusa</i> ssp. <i>franciscana</i> | 20  | 1.1  | 0.2 | 3.0  |
|              | AGOSE  | <i>Agoseris</i>                                      | 20  | 0.2  | 0.2 | 0.2  |
|              | CYEC   | <i>Cynosurus echinatus</i>                           | 20  | 0.2  | 0.2 | 0.2  |
|              | EPBR3  | <i>Epilobium brachycarpum</i>                        | 20  | 0.2  | 0.2 | 0.2  |
|              | HEMI9  | <i>Hesperolinon micranthum</i>                       | 20  | 0.2  | 0.2 | 0.2  |
|              | LOHU2  | <i>Lotus humistratus</i>                             | 20  | 0.2  | 0.2 | 0.2  |
|              | LOWR2  | <i>Lotus wrangelianus</i>                            | 20  | 0.2  | 0.2 | 0.2  |
|              | NALE2  | <i>Nassella lepida</i>                               | 20  | 0.2  | 0.2 | 0.2  |
|              | POSE   | <i>Poa secunda</i>                                   | 20  | 0.2  | 0.2 | 0.2  |
| Non-vascular | 2MOSS  | Moss   | 20  | 5.7  | 1.0 | 10.0 |



**Noteworthy Taxa**

- Gilia capitata* ssp. *tomentosa*  
 CA rare plant rank: 1B.1  
 NatureServe Global/State rank: G5T2/S2
- Hemizonia congesta* ssp. *congesta*  
 CA rare plant rank: 1B.2  
 NatureServe Global/State rank: G5T2/S2
- Hesperervax sparsiflora* var. *brevifolia*  
 CA rare plant rank: 1B.2  
 NatureServe Global/State rank: G4T3/S2

***Festuca californica* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 65            | –          |
| <b>Herb</b>                          | 65.0         | 65            | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

- Aspect:** variable (1)
- Macrotopography:** lower 1/3 of slope (1)
- Microtopography:** concave (1)
- Parent material:** serpentine (1)
- Soil texture:** clay or clay loam (1)
- Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 855 ft. | 855 ft. |
| <b>Slope</b>             | 5.0°    | 5°      |
| <b>Large rock cover</b>  | 16.2%   | 16.2%   |
| <b>Small rock cover</b>  | 2.0%    | 2%      |
| <b>Bare ground cover</b> | 78.0%   | 78%     |
| <b>Litter cover</b>      | 3.0%    | 3%      |

**Samples Used to Describe Association (n=1)**

- Rapid Assessments:** MILOB121
- Relevés:** none

**SCV Global/State Rank:** G3?/S2?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Festuca californica* Provisional Association**

n = 1

| Lifeform | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Herb     | FECA   | <i>Festuca californica</i>                          | 100 | 63.0 | 63.0 | 63.0 |
|          | ESCA2  | <i>Eschscholzia californica</i>                     | 100 | 1.0  | 1.0  | 1.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                     | 100 | 1.0  | 1.0  | 1.0  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>   | 100 | 0.2  | 0.2  | 0.2  |
|          | ERIOG  | <i>Eriogonum</i>                                    | 100 | 0.2  | 0.2  | 0.2  |
|          | BRCA5  | <i>Bromus carinatus</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|          | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i> | 100 | 0.2  | 0.2  | 0.2  |
|          | DICHE2 | <i>Dichelostemma</i>                                | 100 | 0.2  | 0.2  | 0.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|          | LACTU  | <i>Lactuca</i>                                      | 100 | 0.2  | 0.2  | 0.2  |
|          | LOPE   | <i>Lolium perenne</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|          | NAPU4  | <i>Nassella pulchra</i>                             | 100 | 0.2  | 0.2  | 0.2  |
|          | ACMI2  | <i>Achillea millefolium</i>                         | 100 | 0.2  | 0.2  | 0.2  |
|          | KOMA   | <i>Koeleria macrantha</i>                           | 100 | 0.2  | 0.2  | 0.2  |

***Festuca idahoensis* – *Bromus carinatus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 50.0         | 35–65         | –          |
| <b>Herb</b>                          | 50.0         | 35–65         | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2)

**Macrotopography:** lower to middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** flat (2)

**Parent material:** mixed alluvium (1), serpentine (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** moderate/6-25° (1), steep/>25° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 401 ft. | 206–596 ft. |
| <b>Slope</b>             | 25.5°   | 25–26°      |
| <b>Large rock cover</b>  | 0.2%    | 0–0.4%      |
| <b>Small rock cover</b>  | 19.5%   | 2–37%       |
| <b>Bare ground cover</b> | 36.0%   | 28–44%      |
| <b>Litter cover</b>      | 30.0%   | 15–45%      |

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**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none  
**Relevés:** HEAD0215, SONO0244

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Festuca idahoensis* – *Bromus carinatus* Association**

n = 2

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|--|------------|------------|------------|------------|
| <b>Regenerating or Understory Tree</b> |             |  |            |            |            |            |
|  | PSME        | <i>Pseudotsuga menziesii</i>                         | 50         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |  |            |            |            |            |
|  | FEID        | <i>Festuca idahoensis</i>                            | 100        | 49.0       | 30.0       | 68.0       |
|  | BRCA5       | <i>Bromus carinatus</i>                              | 100        | 4.1        | 0.2        | 8.0        |
|  | ELGL        | <i>Elymus glaucus</i>                                | 100        | 2.5        | 2.0        | 3.0        |
|  | AICA        | <i>Aira caryophyllea</i>                             | 100        | 1.6        | 0.2        | 3.0        |
|  | VUMI        | <i>Vulpia microstachys</i>                           | 100        | 0.6        | 0.2        | 1.0        |
|  | TRLA16      | <i>Triteleia laxa</i>                                | 100        | 0.6        | 0.1        | 1.0        |
|  | BRHO2       | <i>Bromus hordeaceus</i>                             | 100        | 0.2        | 0.2        | 0.2        |
|  | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 100        | 0.2        | 0.2        | 0.2        |
|  | LACA7       | <i>Lasthenia californica</i>                         | 100        | 0.2        | 0.1        | 0.2        |
|  | ERIOG       | <i>Eriogonum</i>                                     | 50         | 8.0        | 8.0        | 8.0        |
|  | NAPU4       | <i>Nassella pulchra</i>                              | 50         | 3.0        | 3.0        | 3.0        |
|  | LOPE        | <i>Lolium perenne</i>                                | 50         | 3.0        | 3.0        | 3.0        |
|  | LOUNU       | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> | 50         | 1.0        | 1.0        | 1.0        |
|  | ERLA6       | <i>Eriophyllum lanatum</i>                           | 50         | 1.0        | 1.0        | 1.0        |
|  | COSP        | <i>Collinsia sparsiflora</i>                         | 50         | 1.0        | 1.0        | 1.0        |
|  | DAPU3       | <i>Daucus pusillus</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|  | TRGR2       | <i>Trifolium gracilentum</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | VUBR        | <i>Vulpia bromoides</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|  | TRWI3       | <i>Trifolium willdenovii</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | AGOSE       | <i>Agoseris</i>                                      | 50         | 0.2        | 0.2        | 0.2        |
|  | AGHE2       | <i>Agoseris heterophylla</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | ANAR        | <i>Anagallis arvensis</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|  | ANGEL       | <i>Angelica</i>                                      | 50         | 0.2        | 0.2        | 0.2        |
|  | CAMI        | <i>Calochortus minimus</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|  | CLEX2       | <i>Claytonia exigua</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|  | DACA3       | <i>Danthonia californica</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | EPDE4       | <i>Epilobium densiflorum</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|  | EPMI        | <i>Epilobium minutum</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|  | PLCA5       | <i>Platystemon californicus</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|  | SIBE        | <i>Sisyrinchium bellum</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|  | SAGIN       | <i>Sagina</i>  | 50         | 0.2        | 0.2        | 0.2        |
|  | CRCO34      | <i>Crassula connata</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|  | POA         | <i>Poa</i>   | 50         | 0.2        | 0.2        | 0.2        |
|  | ESCA2       | <i>Eschscholzia californica</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|  | PLER3       | <i>Plantago erecta</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|  | PETR7       | <i>Pentagramma triangularis</i>                      | 50         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Festuca idahoensis* – *Bromus carinatus* Association**

n = 2

| Lifeform            | Code   | Botanical Name                                     | Con | Avg | Min | Max |
|---------------------|--------|--|-----|-----|-----|-----|
| Herb                | MASA   | <i>Madia sativa</i>                                | 50  | 0.2 | 0.2 | 0.2 |
|                     | MAEX   | <i>Madia exigua</i>                                | 50  | 0.2 | 0.2 | 0.2 |
|                     | LOWR2  | <i>Lotus wrangelianus</i>                          | 50  | 0.2 | 0.2 | 0.2 |
|                     | KOMA   | <i>Koeleria macrantha</i>                          | 50  | 0.2 | 0.2 | 0.2 |
|                     | GIACM  | <i>Gilia achilleifolia</i> ssp. <i>multicaulis</i> | 50  | 0.2 | 0.2 | 0.2 |
|                     | RAOC   | <i>Ranunculus occidentalis</i>                     | 50  | 0.2 | 0.2 | 0.2 |
|                     | HYRA3  | <i>Hypochaeris radicata</i>                        | 50  | 0.1 | 0.1 | 0.1 |
|                     | SABI3  | <i>Sanicula bipinnatifida</i>                      | 50  | 0.1 | 0.1 | 0.1 |
| <b>Non-vascular</b> |        |  |     |     |     |     |
|                     | 2MOSS  | Moss   | 50  | 6.0 | 6.0 | 6.0 |
|                     | 2LICHN | Lichen   | 50  | 4.0 | 4.0 | 4.0 |

***Festuca idahoensis* – *Danthonia californica* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (7) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 55.0         | 35–75 <sup>1</sup> | –          |
| <b>Herb</b>                          | 58.1         | 35–80              | –          |
| <b>Shrub</b>                         | 0.4          | 0–2                | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (4), SE (2), SW (2)

**Macrotopography:** middle 1/3 of slope (3), upper 1/3 of slope (5)

**Microtopography:** concave (1), convex (5), undulating (2)

**Parent material:** metasedimentary (2), sedimentary (1), serpentine (3), ultramafic (2)

**Soil texture:** clay or clay loam (6), loam or sandy loam (2)

**Slope steepness:** moderate/6–25° (7), steep/>25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 761 ft. | 183–1046 ft. |
| <b>Slope</b>             | 17.3°   | 8–30°        |
| <b>Large rock cover</b>  | 14.8%   | 0–40%        |
| <b>Small rock cover</b>  | 15.9%   | 0–40%        |
| <b>Bare ground cover</b> | 10.3%   | 2–20%        |
| <b>Litter cover</b>      | 37.0%   | 5–81%        |

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

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**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** none

**Relevés:** HEAD0091, HEAD0101, HEAD0107, HEAD0206, HEAD0373, HEAD0393, HEAD0395, HEAD0419

**SCV Global/State Rank:** G3?/S2?¹

**STAND TABLE**

***Festuca idahoensis* – *Danthonia californica* Provisional Association**

n = 8

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Shrub    | BAPI   | <i>Baccharis pilularis</i>                           | 25  | 1.6  | 0.2 | 3.0  |
| Herb     | FEID   | <i>Festuca idahoensis</i>                            | 100 | 29.3 | 8.0 | 68.0 |
|          | DACA3  | <i>Danthonia californica</i>                         | 100 | 3.9  | 0.2 | 8.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 88  | 3.5  | 0.2 | 18.0 |
|          | ELGL   | <i>Elymus glaucus</i>                                | 88  | 3.2  | 0.2 | 8.0  |
|          | KOMA   | <i>Koeleria macrantha</i>                            | 75  | 5.0  | 0.2 | 8.0  |
|          | PLER3  | <i>Plantago erecta</i>                               | 75  | 1.6  | 0.2 | 3.0  |
|          | AICA   | <i>Aira caryophyllea</i>                             | 75  | 1.1  | 0.1 | 3.0  |
|          | DAPU3  | <i>Daucus pusillus</i>                               | 75  | 0.2  | 0.2 | 0.2  |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 63  | 8.3  | 0.2 | 38.0 |
|          | ELMU3  | <i>Elymus multisetus</i>                             | 63  | 3.9  | 0.2 | 8.0  |
|          | ERLAA3 | <i>Eriophyllum lanatum</i> var. <i>arachnoideum</i>  | 63  | 2.3  | 0.2 | 8.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                           | 63  | 1.4  | 0.2 | 3.2  |
|          | MIDO3  | <i>Minuartia douglasii</i>                           | 63  | 0.7  | 0.1 | 3.0  |
|          | EPMI   | <i>Epilobium minutum</i>                             | 63  | 0.2  | 0.2 | 0.2  |
|          | SABI3  | <i>Sanicula bipinnatifida</i>                        | 63  | 0.2  | 0.1 | 0.2  |
|          | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i>       | 50  | 10.4 | 0.2 | 38.0 |
|          | MOPU2  | <i>Monardella purpurea</i>                           | 50  | 3.6  | 0.2 | 8.0  |
|          | IRMA   | <i>Iris macrosiphon</i>                              | 50  | 2.9  | 0.2 | 8.0  |
|          | GRHI   | <i>Grindelia hirsutula</i>                           | 50  | 2.3  | 0.2 | 3.0  |
|          | CAMU3  | <i>Calycadenia multiglandulosa</i>                   | 50  | 2.3  | 0.2 | 3.0  |
|          | LODA   | <i>Lomatium dasycarpum</i>                           | 50  | 1.6  | 0.2 | 3.0  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 50  | 1.6  | 0.2 | 3.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                          | 50  | 1.6  | 0.2 | 3.0  |
|          | ERREA  | <i>Erigeron reductus</i> var. <i>angustatus</i>      | 50  | 0.9  | 0.2 | 3.0  |
|          | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>  | 50  | 0.9  | 0.2 | 3.0  |
|          | GICAT2 | <i>Gilia capitata</i> ssp. <i>tomentosa</i>          | 50  | 0.2  | 0.2 | 0.2  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 50  | 0.2  | 0.1 | 0.2  |
|          | VUBR   | <i>Vulpia bromoides</i>                              | 38  | 6.1  | 0.2 | 18.0 |
|          | CASUF2 | <i>Castilleja subinclusa</i> ssp. <i>franciscana</i> | 38  | 1.1  | 0.2 | 3.0  |
|          | LOUT   | <i>Lomatium utriculatum</i>                          | 38  | 1.1  | 0.2 | 3.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 38  | 1.1  | 0.2 | 3.0  |
|          | RACA2  | <i>Ranunculus californicus</i>                       | 38  | 0.2  | 0.2 | 0.2  |
|          | LOHU2  | <i>Lotus humistratus</i>                             | 38  | 0.2  | 0.2 | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                            | 38  | 0.2  | 0.2 | 0.2  |
|          | CYEC   | <i>Cynosurus echinatus</i>                           | 38  | 0.2  | 0.2 | 0.2  |
|          | HEMI9  | <i>Hesperolinon micranthum</i>                       | 38  | 0.2  | 0.2 | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Festuca idahoensis* – *Danthonia californica* Provisional Association**

n = 8

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | NALE2  | <i>Nassella lepida</i>                               | 38  | 0.2  | 0.2 | 0.2  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 38  | 0.2  | 0.1 | 0.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                          | 25  | 19.1 | 0.2 | 38.0 |
|          | ERNU3  | * <i>Eriogonum nudum</i>                             | 25  | 4.1  | 0.2 | 8.0  |
|          | AGPA8  | <i>Agrostis pallens</i>                              | 25  | 3.0  | 3.0 | 3.0  |
|          | TRLA16 | <i>Triteleia laxa</i>                                | 25  | 3.0  | 3.0 | 3.0  |
|          | LOPE   | <i>Lolium perenne</i>                                | 25  | 1.6  | 0.2 | 3.0  |
|          | ERLU5  | * <i>Eriogonum luteolum</i>                          | 25  | 1.6  | 0.2 | 3.0  |
|          | WYAN   | <i>Wyethia angustifolia</i>                          | 25  | 0.2  | 0.2 | 0.2  |
|          | CALU9  | <i>Calochortus luteus</i>                            | 25  | 0.2  | 0.2 | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>                               | 25  | 0.2  | 0.2 | 0.2  |
|          | BRODI  | <i>Brodiaea</i>                                      | 25  | 0.2  | 0.2 | 0.2  |
|          | METO   | <i>Melica torreyana</i>                              | 25  | 0.2  | 0.2 | 0.2  |
|          | EPBR3  | <i>Epilobium brachycarpum</i>                        | 25  | 0.2  | 0.2 | 0.2  |
|          | POSE   | <i>Poa secunda</i>                                   | 25  | 0.2  | 0.2 | 0.2  |
|          | ERLUL  | * <i>Eriogonum luteolum</i> var. <i>luteolum</i>     | 25  | 0.2  | 0.2 | 0.2  |
|          | VISA   | <i>Vicia sativa</i>                                  | 25  | 0.2  | 0.2 | 0.2  |
|          | ERNUO  | * <i>Eriogonum nudum</i> var. <i>oblongifolium</i>   | 25  | 0.2  | 0.2 | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>                                 | 25  | 0.2  | 0.1 | 0.2  |
|          | PETR7  | <i>Pentagramma triangularis</i>                      | 25  | 0.1  | 0.1 | 0.1  |

**Noteworthy Taxa**

*Gilia capitata* ssp. *tomentosa*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G5T2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T2/S2

*Hesperevax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Festuca idahoensis* Ultramafic Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (2), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 30.3         | 25–34         | –          |
| <b>Herb</b>                          | 30.3         | 25–34         | <0.5–1     |
| <b>Shrub</b>                         | 0.1          | 0–0.2         | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 0.5–1      |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.5          | 0–2           | 5–10       |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (3), SW (1)

**Macrotopography:** lower 1/3 of slope (2), middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** convex (3), undulating (1)

**Parent material:** Franciscan melange (1), serpentine (3)

**Soil texture:** clay or clay loam (3)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 914 ft. | 531–1292 ft. |
| <b>Slope</b>             | 14.3°   | 5–22°        |
| <b>Large rock cover</b>  | 1.9%    | 0–7%         |
| <b>Small rock cover</b>  | 14.6%   | 0–45%        |
| <b>Bare ground cover</b> | 38.8%   | 28–55%       |
| <b>Litter cover</b>      | 41.0%   | 9–65%        |

**Samples Used to Describe Association (n=4)**

**Rapid Assessments:** MILOB103, SONO0057

**Relevés:** SONO0355, SONO0480

**SCV Global/State Rank:** G3?/S2?¹

**STAND TABLE**

***Festuca idahoensis* Ultramafic Provisional Association**

n = 4

| Lifeform                               | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|--|-------|--------------------------------|-----|------|------|------|
| <b>Tree</b>                            | PISA2 | * <i>Pinus sabiniana</i>       | 25  | 2.0  | 2.0  | 2.0  |
| <b>Regenerating or Understory Tree</b> | PISA2 | * <i>Pinus sabiniana</i>       | 25  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b>                           | CEJE  | <i>Ceanothus jepsonii</i>      | 50  | 0.2  | 0.2  | 0.2  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i> | 25  | 0.2  | 0.2  | 0.2  |
|  | QUDU4 | <i>Quercus durata</i>          | 25  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            | FEID  | <i>Festuca idahoensis</i>      | 100 | 18.8 | 11.0 | 23.0 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Festuca idahoensis* Ultramafic Provisional Association**

n = 4

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | PLER3       | <i>Plantago erecta</i>                               | 75         | 2.1        | 0.2        | 6.0        |
|                     | LOUT        | <i>Lomatium utriculatum</i>                          | 75         | 1.1        | 0.2        | 2.0        |
|                     | SIBE        | <i>Sisyrinchium bellum</i>                           | 75         | 0.5        | 0.2        | 1.0        |
|                     | CALYS       | <i>Calystegia</i>                                    | 50         | 2.0        | 1.0        | 3.0        |
|                     | ACMI2       | <i>Achillea millefolium</i>                          | 50         | 1.5        | 1.0        | 2.0        |
|                     | ELMU3       | <i>Elymus multisetus</i>                             | 50         | 0.6        | 0.2        | 1.0        |
|                     | SABI3       | <i>Sanicula bipinnatifida</i>                        | 50         | 0.6        | 0.2        | 1.0        |
|                     | HECOC2      | <i>Hemizonia congesta</i> ssp. <i>congesta</i>       | 25         | 12.0       | 12.0       | 12.0       |
|                     | LODA        | <i>Lomatium dasycarpum</i>                           | 25         | 2.0        | 2.0        | 2.0        |
|                     | AICA        | <i>Aira caryophyllea</i>                             | 25         | 2.0        | 2.0        | 2.0        |
|                     | VUMI        | <i>Vulpia microstachys</i>                           | 25         | 2.0        | 2.0        | 2.0        |
|                     | MONAR2      | <i>Monardella</i>                                    | 25         | 1.0        | 1.0        | 1.0        |
|                     | BRHO2       | <i>Bromus hordeaceus</i>                             | 25         | 1.0        | 1.0        | 1.0        |
|                     | IRDO        | <i>Iris douglasiana</i>                              | 25         | 1.0        | 1.0        | 1.0        |
|                     | RACA2       | <i>Ranunculus californicus</i>                       | 25         | 1.0        | 1.0        | 1.0        |
|                     | CUPE3       | <i>Cuscuta pentagona</i>                             | 25         | 1.0        | 1.0        | 1.0        |
|                     | RACA        | <i>Rafinesquia californica</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|                     | POSE        | <i>Poa secunda</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                     | SHAR2       | <i>Sherardia arvensis</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                     | EPBR3       | <i>Epilobium brachycarpum</i>                        | 25         | 0.2        | 0.2        | 0.2        |
|                     | TRBI        | <i>Trifolium bifidum</i>                             | 25         | 0.2        | 0.2        | 0.2        |
|                     | LEBI8       | <i>Leptosiphon bicolor</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                     | VIBE        | <i>Vicia benghalensis</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                     | PENA2       | <i>Petrorhagia nanteuillii</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|                     | PEKE        | <i>Perideridia kelloggii</i>                         | 25         | 0.2        | 0.2        | 0.2        |
|                     | PETR7       | <i>Pentagramma triangularis</i>                      | 25         | 0.2        | 0.2        | 0.2        |
|                     | LOWR2       | <i>Lotus wrangelianus</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                     | LOPE        | <i>Lolium perenne</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                     | LACA7       | <i>Lasthenia californica</i>                         | 25         | 0.2        | 0.2        | 0.2        |
|                     | ERNU3       | <i>Eriogonum nudum</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|                     | GAPA5       | <i>Galium parisiense</i>                             | 25         | 0.2        | 0.2        | 0.2        |
|                     | DICHE2      | <i>Dichelostemma</i>                                 | 25         | 0.2        | 0.2        | 0.2        |
|                     | ELGL        | <i>Elymus glaucus</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                     | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 25         | 0.2        | 0.2        | 0.2        |
|                     | AGOSE       | <i>Agoseris</i>                                      | 25         | 0.2        | 0.2        | 0.2        |
|                     | ALLIU       | <i>Allium</i>  | 25         | 0.2        | 0.2        | 0.2        |
|                     | ATPU        | <i>Athysanus pusillus</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                     | CHLOR3      | <i>Chlorogalum</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                     | CLPE        | <i>Claytonia perfoliata</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                     | GRIND       | <i>Grindelia</i>                                     | 25         | 0.2        | 0.2        | 0.2        |
|                     | TRIFO       | <i>Trifolium</i>                                     | 25         | 0.1        | 0.1        | 0.1        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 50         | 5.5        | 1.0        | 10.0       |



**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T2/S2

***Grindelia (stricta)* Provisional Alliance**  
**Gum plant patches**

Statewide (Sawyer et al. 2009)

*Grindelia stricta* or another *Grindelia* species is dominant in the herbaceous layer with *Distichlis spicata*, *Frankenia salina*, *Jaumea carnosa*, *Juncus arcticus*, *Limonium californicum*, *Sarcocornia pacifica* and *Triglochin maritima*.

*Grindelia camporum*, as well as *G. stricta* and subspecies of *G. stricta*, are all assigned to the same alliance at this point. However, each species tends to have different environmental preferences. *Grindelia camporum* stands typically occur in moist freshwater inland areas in the Great Valley. *Grindelia stricta* appears to be broadly tolerant of salt or brackish conditions, as in salt marsh edges or along coastal bluffs or stabilized coastal dunes.

Sonoma County

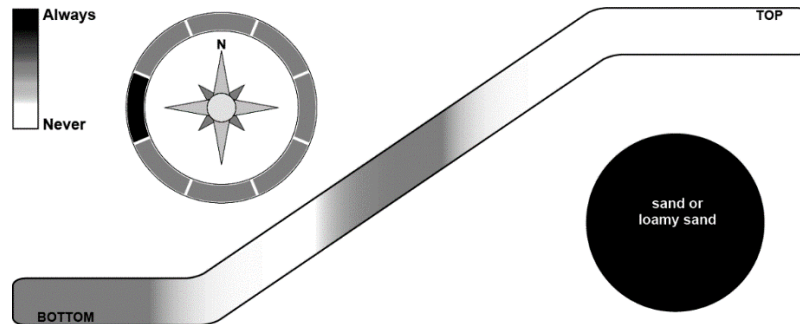
The two stands of *Grindelia* sampled in the county are both ascribed to *G. stricta* and both occur in salt or brackish marsh conditions, one near the mouth of Salmon Creek near Bodega Bay and the other in a salt marsh at the edge of San Pablo Bay. Mixed stands with co-dominant *Sarcocornia pacifica* should be keyed to the *Sarcocornia pacifica* (*Salicornia depressa*) Alliance.

**Local Alliance Summary (n = 2)**

**Elevation:** 0–6 ft, mean 3 ft

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 35.0         | 30–40         | –          |
| <b>Herb</b>             | 33.5         | 27–40         | 0.5–1      |
| <b>Shrub</b>            | 1.5          | 1–2           | 0.5–1      |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Summary of Environmental Data

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 3.0°  | 0–6°   |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.1%  | 0–0.2% |
| Bare ground cover | 7.5%  | 3–12%  |
| Litter cover      | 90.0% | 85–95% |

Associations within this Alliance:

*Grindelia stricta* Provisional Association

**STAND TABLE**

*Grindelia (stricta)* Provisional Alliance

n = 2

| Lifeform     | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--------------|--------|---|-----|------|------|------|
| Shrub        | BAPI   | <i>Baccharis pilularis</i>                          | 100 | 1.5  | 1.0  | 2.0  |
| Herb         | DISP   | <i>Distichlis spicata</i>                           | 100 | 1.6  | 0.2  | 3.0  |
|              | GRSTP2 | * <i>Grindelia stricta</i> var. <i>platyphylla</i>  | 50  | 27.0 | 27.0 | 27.0 |
|              | GRSTA2 | * <i>Grindelia stricta</i> var. <i>angustifolia</i> | 50  | 12.0 | 12.0 | 12.0 |
|              | RASA2  | <i>Raphanus sativus</i>                             | 50  | 10.0 | 10.0 | 10.0 |
|              | VUBR   | <i>Vulpia bromoides</i>                             | 50  | 10.0 | 10.0 | 10.0 |
|              | BRDI3  | <i>Bromus diandrus</i>                              | 50  | 5.0  | 5.0  | 5.0  |
|              | HOB2   | <i>Hordeum brachyantherum</i>                       | 50  | 3.0  | 3.0  | 3.0  |
|              | AMAR4  | <i>Ammophila arenaria</i>                           | 50  | 2.0  | 2.0  | 2.0  |
|              | PLSU2  | <i>Plantago subnuda</i>                             | 50  | 2.0  | 2.0  | 2.0  |
|              | SAPA30 | <i>Sarcocornia pacifica</i>                         | 50  | 2.0  | 2.0  | 2.0  |
|              | ANAR   | <i>Anagallis arvensis</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|              | BRNI   | <i>Brassica nigra</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|              | CAED3  | <i>Carpobrotus edulis</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|              | GAAP2  | <i>Galium aparine</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|              | GEDI   | <i>Geranium dissectum</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|              | HYPOC  | <i>Hypochaeris</i>                                  | 50  | 0.2  | 0.2  | 0.2  |
|              | JUNCU  | <i>Juncus</i>                                       | 50  | 0.2  | 0.2  | 0.2  |
|              | OESA   | <i>Oenanthe sarmentosa</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|              | PSLU6  | <i>Pseudognaphalium luteoalbum</i>                  | 50  | 0.2  | 0.2  | 0.2  |
|              | RUCR   | <i>Rumex crispus</i>                                | 50  | 0.2  | 0.2  | 0.2  |
|              | SOOL   | <i>Sonchus oleraceus</i>                            | 50  | 0.2  | 0.2  | 0.2  |
|              | TRIFO  | <i>Trifolium</i>                                    | 50  | 0.2  | 0.2  | 0.2  |
| Non-vascular | 2MOSS  | Moss  | 50  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

## ***Grindelia stricta* Provisional Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 35.0                | 30–40                | –                 |
| <b>Herb</b>                          | 33.5                | 27–40                | 0.5–1             |
| <b>Shrub</b>                         | 1.5                 | 1–2                  | 0.5–1             |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** Flat (1), NW (1)

**Macrotopography:** bottom (1), middle 1/3 of slope (1)

**Microtopography:** flat (2)

**Parent material:** mixed alluvium (1), sand dunes (1)

**Soil texture:** sand (1)

**Slope steepness:** flat/0° (1), moderate/6-25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 3 ft.       | 0–6 ft.      |
| <b>Slope</b>             | 3.0°        | 0–6°         |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 0.1%        | 0–0.2%       |
| <b>Bare ground cover</b> | 7.5%        | 3–12%        |
| <b>Litter cover</b>      | 90.0%       | 85–95%       |

### **Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none

**Relevés:** SONO0448, SONO0666

**SCV Global/State Rank:** G3?/S3?¹

### **STAND TABLE**

#### ***Grindelia stricta* Provisional Association**

n = 2

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                               | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Shrub</b>    |             |   |            |            |            |            |
|                 | BAPI        | <i>Baccharis pilularis</i>                          | 100        | 1.5        | 1.0        | 2.0        |
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | DISP        | <i>Distichlis spicata</i>                           | 100        | 1.6        | 0.2        | 3.0        |
|                 | GRSTP2      | * <i>Grindelia stricta</i> var. <i>platyphylla</i>  | 50         | 27.0       | 27.0       | 27.0       |
|                 | GRSTA2      | * <i>Grindelia stricta</i> var. <i>angustifolia</i> | 50         | 12.0       | 12.0       | 12.0       |
|                 | RASA2       | <i>Raphanus sativus</i>                             | 50         | 10.0       | 10.0       | 10.0       |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE**

***Grindelia stricta* Provisional Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|------------------------------------|------------|------------|------------|------------|
| <b>Herb</b>         |             |                                    |            |            |            |            |
|                     | VUBR        | <i>Vulpia bromoides</i>            | 50         | 10.0       | 10.0       | 10.0       |
|                     | BRDI3       | <i>Bromus diandrus</i>             | 50         | 5.0        | 5.0        | 5.0        |
|                     | HOBR2       | <i>Hordeum brachyantherum</i>      | 50         | 3.0        | 3.0        | 3.0        |
|                     | SAPA30      | <i>Sarcocornia pacifica</i>        | 50         | 2.0        | 2.0        | 2.0        |
|                     | AMAR4       | <i>Ammophila arenaria</i>          | 50         | 2.0        | 2.0        | 2.0        |
|                     | PLSU2       | <i>Plantago subnuda</i>            | 50         | 2.0        | 2.0        | 2.0        |
|                     | HYPOC       | <i>Hypochaeris</i>                 | 50         | 0.2        | 0.2        | 0.2        |
|                     | SOOL        | <i>Sonchus oleraceus</i>           | 50         | 0.2        | 0.2        | 0.2        |
|                     | RUCR        | <i>Rumex crispus</i>               | 50         | 0.2        | 0.2        | 0.2        |
|                     | PSLU6       | <i>Pseudognaphalium luteoalbum</i> | 50         | 0.2        | 0.2        | 0.2        |
|                     | TRIFO       | <i>Trifolium</i>                   | 50         | 0.2        | 0.2        | 0.2        |
|                     | JUNCU       | <i>Juncus</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|                     | GAAP2       | <i>Galium aparine</i>              | 50         | 0.2        | 0.2        | 0.2        |
|                     | CAED3       | <i>Carpobrotus edulis</i>          | 50         | 0.2        | 0.2        | 0.2        |
|                     | BRNI        | <i>Brassica nigra</i>              | 50         | 0.2        | 0.2        | 0.2        |
|                     | ANAR        | <i>Anagallis arvensis</i>          | 50         | 0.2        | 0.2        | 0.2        |
|                     | OESA        | <i>Oenanthe sarmentosa</i>         | 50         | 0.2        | 0.2        | 0.2        |
|                     | GED1        | <i>Geranium dissectum</i>          | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |                                    |            |            |            |            |
|                     | 2MOSS       | Moss                               | 50         | 0.2        | 0.2        | 0.2        |

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***Heterotheca (oregona, sessiliflora)* Provisional Alliance**  
**Golden aster flats**

Statewide

*Heterotheca oregona* or *H. sessiliflora* is co-dominant to dominant in the herb layer, occurring with other natives such as *Clarkia purpurea* and *Lotus unifoliolatus* var. *unifoliolatus*, and non-natives such as *Brassica nigra*, *Bromus* spp., *Erodium* spp., *Hypochaeris glabra*, *Logfia gallica*, *Petrorhagia dubia*, and *Vulpia* spp.

*Heterotheca oregona* is a native ruderal perennial herb or sub-shrub that colonizes and forms open stands mixed with mostly annual native and non-native species. These stands occur exclusively on river or stream gravel bars which have not been flooded for several years. The stands are typically several meters above the active stream channel, but within the flood stage inundation zone. Substrate texture is coarse sand, ranging upward to large gravel or small cobble size. *Heterotheca* stands are well drained with relatively low water tables. *Heterotheca oregona* is the dominant in stands identified within the northern Great Valley and North Coast Ranges, while *H. sessiliflora* is dominant in stands in the Central Coast Ranges (Kittel et al. 2012).

Sonoma County

*Heterotheca (oregona, sessiliflora)* stands occur on upper gravel bars in openings between *Salix exigua* stands or riparian tree stands along the Russian River, and perhaps along other, larger streams in the county. Compared to ruderal, weedy stands of *Bromus* and *Vulpia*, *Heterotheca* stands occur on coarser gravel and cobbles, higher above the active channel.

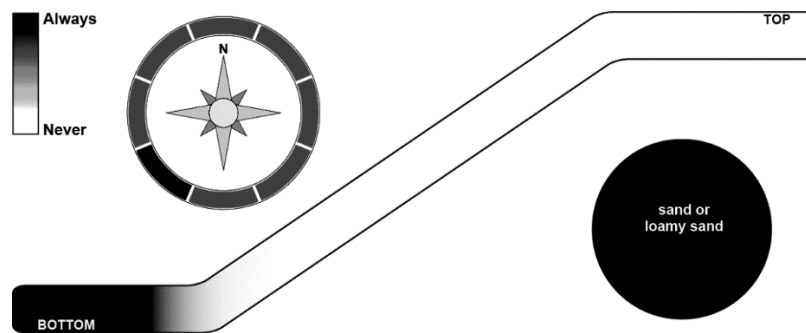
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**Local Alliance Summary (n = 3)**

**Elevation:** 184–550 ft, mean 333 ft

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 22.7         | 4–43          | –          |
| <b>Herb</b>                          | 22.7         | 4–43          | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 0.7°  | 0–2°   |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 69.4% | 30–93% |
| <b>Bare ground cover</b> | 28.0% | 5–66%  |
| <b>Litter cover</b>      | 2.0%  | 1–3%   |

**Associations within this Alliance:**

*Heterotheca oregona* Provisional Association

**STAND TABLE**

***Heterotheca (oregona, sessiliflora)* Provisional Alliance**

n = 3

| Lifeform     | Code   | Botanical Name                 | Con | Avg  | Min | Max  |
|--------------|--------|--------------------------------|-----|------|-----|------|
| <b>Shrub</b> |        |                                |     |      |     |      |
|              | BRCA3  | <i>Brickellia californica</i>  | 33  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>  |        |                                |     |      |     |      |
|              | HEOR2  | <i>Heterotheca oregona</i>     | 100 | 19.3 | 4.0 | 36.0 |
|              | BRDI3  | <i>Bromus diandrus</i>         | 100 | 1.1  | 0.2 | 2.0  |
|              | BRNI   | <i>Brassica nigra</i>          | 100 | 0.2  | 0.2 | 0.2  |
|              | TRHI4  | <i>Trifolium hirtum</i>        | 67  | 1.6  | 0.2 | 3.0  |
|              | VUMY   | <i>Vulpia myuros</i>           | 67  | 1.1  | 0.2 | 2.0  |
|              | AVBA   | <i>Avena barbata</i>           | 67  | 0.2  | 0.2 | 0.2  |
|              | BRDI2  | <i>Brachypodium distachyon</i> | 67  | 0.2  | 0.2 | 0.2  |
|              | BRMA   | <i>Briza maxima</i>            | 67  | 0.2  | 0.2 | 0.2  |
|              | CESO3  | <i>Centaurea solstitialis</i>  | 67  | 0.2  | 0.2 | 0.2  |
|              | CRSE11 | <i>Croton setigerus</i>        | 67  | 0.2  | 0.2 | 0.2  |
|              | LOPE   | <i>Lolium perenne</i>          | 67  | 0.2  | 0.2 | 0.2  |
|              | BROMU  | <i>Bromus</i>                  | 33  | 1.0  | 1.0 | 1.0  |
|              | AICA   | <i>Aira caryophyllea</i>       | 33  | 0.2  | 0.2 | 0.2  |
|              | ARDO4  | <i>Arundo donax</i>            | 33  | 0.2  | 0.2 | 0.2  |
|              | BRMA3  | <i>Bromus madritensis</i>      | 33  | 0.2  | 0.2 | 0.2  |
|              | EPILO  | <i>Epilobium</i>               | 33  | 0.2  | 0.2 | 0.2  |
|              | EPBR3  | <i>Epilobium brachycarpum</i>  | 33  | 0.2  | 0.2 | 0.2  |
|              | HYGL2  | <i>Hypochaeris glabra</i>      | 33  | 0.2  | 0.2 | 0.2  |
|              | KICKX  | <i>Kickxia</i>                 | 33  | 0.2  | 0.2 | 0.2  |
|              | LOGA2  | <i>Logfia gallica</i>          | 33  | 0.2  | 0.2 | 0.2  |
|              | LUBI   | <i>Lupinus bicolor</i>         | 33  | 0.2  | 0.2 | 0.2  |
|              | MEDIC  | <i>Medicago</i>                | 33  | 0.2  | 0.2 | 0.2  |
|              | MELA2  | <i>Mentzelia laevicaulis</i>   | 33  | 0.2  | 0.2 | 0.2  |

**STAND TABLE** continued

***Heterotheca (oregona, sessiliflora)* Provisional Alliance**

n = 3

| Lifeform            | Code  | Botanical Name               | Con | Avg | Min | Max |
|---------------------|-------|------------------------------|-----|-----|-----|-----|
| <b>Herb</b>         |       |                              |     |     |     |     |
|                     | PETRO | <i>Petrorhagia</i>           | 33  | 0.2 | 0.2 | 0.2 |
|                     | PEDU2 | <i>Petrorhagia dubia</i>     | 33  | 0.2 | 0.2 | 0.2 |
|                     | PEPR4 | <i>Petrorhagia prolifera</i> | 33  | 0.2 | 0.2 | 0.2 |
|                     | RUAC3 | <i>Rumex acetosella</i>      | 33  | 0.2 | 0.2 | 0.2 |
|                     | TRIFO | <i>Trifolium</i>             | 33  | 0.2 | 0.2 | 0.2 |
|                     | TRWI3 | <i>Trifolium willdenovii</i> | 33  | 0.2 | 0.2 | 0.2 |
|                     | VERBA | <i>Verbascum</i>             | 33  | 0.2 | 0.2 | 0.2 |
|                     | XAST  | <i>Xanthium strumarium</i>   | 33  | 0.2 | 0.2 | 0.2 |
|                     | AVENA | <i>Avena</i>                 | 33  | 0.1 | 0.1 | 0.1 |
| <b>Non-vascular</b> |       |                              |     |     |     |     |
|                     | 2MOSS | Moss                         | 67  | 0.2 | 0.1 | 0.2 |

***Heterotheca oregona* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (2) and Coastal Franciscan/263Ag (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 22.7         | 4–43          | –          |
| <b>Herb</b>                          | 22.7         | 4–43          | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** Flat (2), SW (1)

**Macrotopography:** bottom (3)

**Microtopography:** concave (1), flat (1), undulating (1)

**Parent material:** mixed alluvium (1), sandy alluvium (2)

**Soil texture:** sand (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (1)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 333 ft. | 184–550 ft. |
| <b>Slope</b>             | 0.7°    | 0–2°        |
| <b>Large rock cover</b>  | 0.0%    | 0–0%        |
| <b>Small rock cover</b>  | 69.4%   | 30–93%      |
| <b>Bare ground cover</b> | 28.0%   | 5–66%       |
| <b>Litter cover</b>      | 2.0%    | 1–3%        |



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0783

**Relevés:** SONO0080, SONO0334

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Heterotheca oregona* Provisional Association**

n = 3

| Lifeform            | Code   | Botanical Name                 | Con | Avg  | Min | Max  |
|---------------------|--------|--------------------------------|-----|------|-----|------|
| <b>Shrub</b>        |        |                                |     |      |     |      |
|                     | BRCA3  | <i>Brickellia californica</i>  | 33  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>         |        |                                |     |      |     |      |
|                     | HEOR2  | <i>Heterotheca oregona</i>     | 100 | 19.3 | 4.0 | 36.0 |
|                     | BRDI3  | <i>Bromus diandrus</i>         | 100 | 1.1  | 0.2 | 2.0  |
|                     | BRNI   | <i>Brassica nigra</i>          | 100 | 0.2  | 0.2 | 0.2  |
|                     | TRHI4  | <i>Trifolium hirtum</i>        | 67  | 1.6  | 0.2 | 3.0  |
|                     | VUMY   | <i>Vulpia myuros</i>           | 67  | 1.1  | 0.2 | 2.0  |
|                     | BRDI2  | <i>Brachypodium distachyon</i> | 67  | 0.2  | 0.2 | 0.2  |
|                     | AVBA   | <i>Avena barbata</i>           | 67  | 0.2  | 0.2 | 0.2  |
|                     | BRMA   | <i>Briza maxima</i>            | 67  | 0.2  | 0.2 | 0.2  |
|                     | CRSE11 | <i>Croton setigerus</i>        | 67  | 0.2  | 0.2 | 0.2  |
|                     | LOPE   | <i>Lolium perenne</i>          | 67  | 0.2  | 0.2 | 0.2  |
|                     | CESO3  | <i>Centaurea solstitialis</i>  | 67  | 0.2  | 0.2 | 0.2  |
|                     | BROMU  | <i>Bromus</i>                  | 33  | 1.0  | 1.0 | 1.0  |
|                     | HYGL2  | <i>Hypochaeris glabra</i>      | 33  | 0.2  | 0.2 | 0.2  |
|                     | PEPR4  | <i>Petrorhagia prolifera</i>   | 33  | 0.2  | 0.2 | 0.2  |
|                     | PEDU2  | <i>Petrorhagia dubia</i>       | 33  | 0.2  | 0.2 | 0.2  |
|                     | PETRO  | <i>Petrorhagia</i>             | 33  | 0.2  | 0.2 | 0.2  |
|                     | MELA2  | <i>Mentzelia laevicaulis</i>   | 33  | 0.2  | 0.2 | 0.2  |
|                     | MEDIC  | <i>Medicago</i>                | 33  | 0.2  | 0.2 | 0.2  |
|                     | LUBI   | <i>Lupinus bicolor</i>         | 33  | 0.2  | 0.2 | 0.2  |
|                     | KICKX  | <i>Kickxia</i>                 | 33  | 0.2  | 0.2 | 0.2  |
|                     | TRWI3  | <i>Trifolium willdenovii</i>   | 33  | 0.2  | 0.2 | 0.2  |
|                     | EPBR3  | <i>Epilobium brachycarpum</i>  | 33  | 0.2  | 0.2 | 0.2  |
|                     | EPILO  | <i>Epilobium</i>               | 33  | 0.2  | 0.2 | 0.2  |
|                     | BRMA3  | <i>Bromus madritensis</i>      | 33  | 0.2  | 0.2 | 0.2  |
|                     | ARDO4  | <i>Arundo donax</i>            | 33  | 0.2  | 0.2 | 0.2  |
|                     | AICA   | <i>Aira caryophyllea</i>       | 33  | 0.2  | 0.2 | 0.2  |
|                     | LOGA2  | <i>Logfia gallica</i>          | 33  | 0.2  | 0.2 | 0.2  |
|                     | RUAC3  | <i>Rumex acetosella</i>        | 33  | 0.2  | 0.2 | 0.2  |
|                     | VERBA  | <i>Verbascum</i>               | 33  | 0.2  | 0.2 | 0.2  |
|                     | XAST   | <i>Xanthium strumarium</i>     | 33  | 0.2  | 0.2 | 0.2  |
|                     | TRIFO  | <i>Trifolium</i>               | 33  | 0.2  | 0.2 | 0.2  |
|                     | AVENA  | <i>Avena</i>                   | 33  | 0.1  | 0.1 | 0.1  |
| <b>Non-vascular</b> |        |                                |     |      |     |      |
|                     | 2MOSS  | Moss                           | 67  | 0.2  | 0.1 | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Alliance**

### **Common velvet grass – sweet vernal grass meadows**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Anthoxanthum odoratum* and/or *Holcus lanatus* dominate or co-dominate in the herbaceous layer with *Anagallis arvensis*, *Anthoxanthum odoratum*, *Briza maxima*, *Cirsium vulgare*, *Hypochaeris radicata*, *Plantago lanceolata*, *Rumex acetosella*, and *Vulpia bromoides*.

Stands of *Holcus lanatus* – *Anthoxanthum odoratum* are similar to those of *Agrostis stolonifera* – *Festuca arundinacea*; however, the latter species occur in wetter and more brackish sites of managed wetlands (Pickart 2006). Both *H. lanatus* and *A. odoratum* occur along coastal terraces and moist pastures in central and northern California. Both plants particularly invade stands of the *Calamagrostis nutkaensis*, *Carex obnupta*, *Danthonia californica*, *Deschampsia cespitosa*, and *Hordeum brachyantherum* Alliances (CNPS 2005, Ford and Hayes 2007, Heady et al. 1977, Keeler-Wolf et al. 2003a).

*Holcus lanatus* is a recent invader, now dominating many coastal prairies of California. It has a high capacity for rapid vegetative growth in open areas, but it has a disadvantage against taller natives that create shaded conditions (Grime 1979).

#### Sonoma County

*Holcus lanatus* – *Anthoxanthum odoratum* stands are widespread along coastal terraces and hillsides in grazed or un-grazed fields, mostly less than 3 km from the coast (but up to 13 km). The stands in the county are mostly strongly dominated by the non-native grass *Holcus lanatus*, with or without *Anthoxanthum odoratum* or other perennial non-native grasses.

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#### **Local Alliance Summary (n = 15)**

**Elevation:** 62–695 ft, mean 240 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

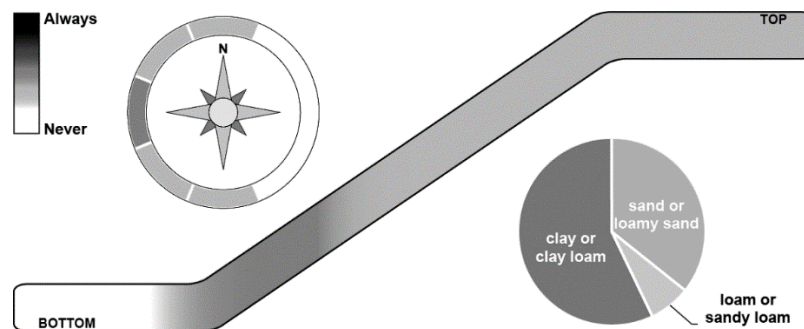
#### **Noteworthy Taxa**

*Sidalcea calycosa* ssp. *rhizomata*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T2/S2

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 70.6         | 30–95         | –          |
| <b>Herb</b>                          | 74.5         | 30–95         | <0.5–0.5   |
| <b>Shrub</b>                         | 3.2          | 0–20          | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 7.2°  | 0–17°  |
| <b>Large rock cover</b>  | 0.1%  | 0–1%   |
| <b>Small rock cover</b>  | 0.9%  | 0–10%  |
| <b>Bare ground cover</b> | 10.5% | 0–72%  |
| <b>Litter cover</b>      | 76.7% | 25–97% |

**Associations within this Alliance:**

*Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Association  
*Holcus lanatus* Semi-Natural Association

**STAND TABLE**

***Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Alliance**

n = 15

| Lifeform     | Code   | Botanical Name                                      | Con | Avg  | Min | Max  |
|--------------|--------|---|-----|------|-----|------|
| <b>Shrub</b> | RUUR   | <i>Rubus ursinus</i>                                | 53  | 6.7  | 0.2 | 18.0 |
|              | BAPI   | <i>Baccharis pilularis</i>                          | 33  | 0.9  | 0.1 | 3.0  |
|              | FRCAC5 | <i>Frangula californica</i> ssp. <i>californica</i> | 20  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>  | HOLA   | <i>Holcus lanatus</i>                               | 93  | 49.6 | 3.0 | 88.0 |
|              | RUAC3  | <i>Rumex acetosella</i>                             | 73  | 3.6  | 0.1 | 18.0 |
|              | BRMA   | <i>Briza maxima</i>                                 | 67  | 5.1  | 0.2 | 38.0 |
|              | CIVU   | <i>Cirsium vulgare</i>                              | 60  | 1.1  | 0.1 | 3.0  |
|              | ANOD   | <i>Anthoxanthum odoratum</i>                        | 53  | 44.3 | 0.2 | 88.0 |
|              | VUBR   | <i>Vulpia bromoides</i>                             | 53  | 7.1  | 0.1 | 38.0 |
|              | HYRA3  | <i>Hypochaeris radicata</i>                         | 53  | 3.4  | 0.1 | 10.0 |
|              | PLLA   | <i>Plantago lanceolata</i>                          | 53  | 2.6  | 0.1 | 11.0 |
|              | ANAR   | <i>Anagallis arvensis</i>                           | 53  | 0.3  | 0.2 | 1.0  |
|              | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 47  | 6.3  | 0.1 | 18.0 |
|              | SOAS   | <i>Sonchus asper</i>                                | 47  | 0.6  | 0.1 | 3.0  |
|              | GEDI   | <i>Geranium dissectum</i>                           | 47  | 0.2  | 0.2 | 0.2  |
|              | LIBI5  | <i>Linum bienne</i>                                 | 47  | 0.2  | 0.1 | 0.2  |
|              | ELGL   | <i>Elymus glaucus</i>                               | 40  | 0.2  | 0.2 | 0.2  |
|              | LETA   | <i>Leontodon taraxacoides</i>                       | 33  | 3.7  | 0.1 | 18.0 |
|              | BRDI3  | <i>Bromus diandrus</i>                              | 33  | 2.5  | 0.2 | 8.0  |
|              | AVBA   | <i>Avena barbata</i>                                | 33  | 1.3  | 0.2 | 3.0  |
|              | AICA   | <i>Aira caryophyllea</i>                            | 33  | 0.8  | 0.2 | 3.0  |
|              | CAPY2  | <i>Carduus pycnocephalus</i>                        | 33  | 0.8  | 0.2 | 3.0  |
|              | GAAP2  | <i>Galium aparine</i>                               | 33  | 0.2  | 0.2 | 0.2  |

**STAND TABLE** continued

***Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Alliance**

n = 15

| Lifeform | Code   | Botanical Name                           | Con | Avg | Min | Max  |
|----------|--------|--|-----|-----|-----|------|
| Herb     |        |  |     |     |     |      |
|          | BRHO2  | <i>Bromus hordeaceus</i>                 | 27  | 7.8 | 0.2 | 18.0 |
|          | 2DAPI  | <i>Danthonia pilosa</i>                  | 27  | 2.9 | 0.2 | 8.0  |
|          | CALYS  | <i>Calystegia</i>                        | 27  | 2.8 | 0.1 | 8.0  |
|          | BRCA5  | <i>Bromus carinatus</i>                  | 27  | 0.9 | 0.2 | 3.0  |
|          | VISA   | <i>Vicia sativa</i>                      | 27  | 0.9 | 0.2 | 3.0  |
|          | VITE   | <i>Vicia tetrasperma</i>                 | 27  | 0.2 | 0.2 | 0.2  |
|          | IRDO   | <i>Iris douglasiana</i>                  | 20  | 7.1 | 0.2 | 18.0 |
|          | CYEC   | <i>Cynosurus echinatus</i>               | 20  | 2.8 | 0.2 | 8.0  |
|          | STRIR3 | <i>Stachys rigida</i> var. <i>rigida</i> | 20  | 2.8 | 0.2 | 8.0  |
|          | NAPU4  | <i>Nassella pulchra</i>                  | 20  | 2.1 | 0.2 | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                       | 20  | 1.1 | 0.2 | 3.0  |
|          | DACA3  | <i>Danthonia californica</i>             | 20  | 1.1 | 0.2 | 3.0  |
|          | JUPA2  | <i>Juncus patens</i>                     | 20  | 1.1 | 0.2 | 3.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                  | 20  | 1.1 | 0.2 | 3.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>            | 20  | 0.2 | 0.2 | 0.2  |
|          | HEMA80 | <i>Heracleum maximum</i>                 | 20  | 0.2 | 0.1 | 0.2  |

**Noteworthy Taxa**

*Sidalcea calycosa* ssp. *rhizomata*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T2/S2

***Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (7) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 61.5         | 48–75 <sup>1</sup> | –          |
| <b>Herb</b>                          | 77.6         | 48–85              | <0.5–0.5   |
| <b>Shrub</b>                         | 5.7          | 0–20               | <0.5–0.5   |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (6)

**Macrotopography:** lower 1/3 of slope (5), lower to middle 1/3 of slope (1), middle 1/3 of slope (1)

**Microtopography:** flat (7)

**Parent material:** sedimentary (7)

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data, continued**

**Soil texture:** clay or clay loam (2), loam or sandy loam (1), sand (4)

**Slope steepness:** flat/0° (1), gentle/1-5° (3), moderate/6-25° (3)

|                   | Mean    | Range      |
|-------------------|---------|------------|
| Elevation         | 127 ft. | 62–253 ft. |
| Slope             | 5.1°    | 0–12°      |
| Large rock cover  | 0.0%    | 0–0%       |
| Small rock cover  | 1.6%    | 0–10%      |
| Bare ground cover | 4.6%    | 0–25%      |
| Litter cover      | 82.7%   | 57–97%     |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** none

**Relevés:** HEAD0099, HEAD0100, HEAD0198, HEAD0290, HEAD0291, HEAD0292, SONO0445

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Association**

n = 7

| Lifeform | Code                      | Botanical Name                                      | Con | Avg  | Min  | Max  |
|----------|---------------------------|---|-----|------|------|------|
| Shrub    | RUUR                      | <i>Rubus ursinus</i>                                | 86  | 7.1  | 0.2  | 18.0 |
|          | BAPI                      | <i>Baccharis pilularis</i>                          | 43  | 1.1  | 0.1  | 3.0  |
|          | FRCAC5                    | <i>Frangula californica</i> ssp. <i>californica</i> | 43  | 0.2  | 0.2  | 0.2  |
| Herb     | ANOD                      | <i>Anthoxanthum odoratum</i>                        | 100 | 50.6 | 18.0 | 88.0 |
|          | HOLA                      | <i>Holcus lanatus</i>                               | 86  | 31.3 | 3.0  | 68.0 |
|          | BRMA                      | <i>Briza maxima</i>                                 | 71  | 8.9  | 0.2  | 38.0 |
|          | PTAQP2                    | <i>Pteridium aquilinum</i> var. <i>pubescens</i>    | 71  | 4.9  | 0.1  | 18.0 |
|          | RUAC3                     | <i>Rumex acetosella</i>                             | 71  | 2.9  | 0.1  | 8.0  |
|          | VUBR                      | <i>Vulpia bromoides</i>                             | 57  | 11.6 | 0.1  | 38.0 |
|          | LETA                      | <i>Leontodon taraxacoides</i>                       | 57  | 4.6  | 0.1  | 18.0 |
|          | HYRA3                     | <i>Hypochaeris radicata</i>                         | 57  | 4.1  | 0.1  | 8.0  |
|          | CALYS                     | <i>Calystegia</i>                                   | 57  | 2.8  | 0.1  | 8.0  |
|          | CIVU                      | <i>Cirsium vulgare</i>                              | 57  | 0.9  | 0.2  | 3.0  |
|          | ANAR                      | <i>Anagallis arvensis</i>                           | 57  | 0.2  | 0.2  | 0.2  |
|          | ELGL                      | <i>Elymus glaucus</i>                               | 57  | 0.2  | 0.2  | 0.2  |
|          | BRHO2                     | <i>Bromus hordeaceus</i>                            | 43  | 8.1  | 0.2  | 18.0 |
|          | BRDI3                     | <i>Bromus diandrus</i>                              | 43  | 3.7  | 0.2  | 8.0  |
|          | PLLA                      | <i>Plantago lanceolata</i>                          | 43  | 0.2  | 0.2  | 0.2  |
|          | AICA                      | <i>Aira caryophyllea</i>                            | 43  | 0.2  | 0.2  | 0.2  |
|          | GAAP2                     | <i>Galium aparine</i>                               | 43  | 0.2  | 0.2  | 0.2  |
|          | SOAS                      | <i>Sonchus asper</i>                                | 43  | 0.2  | 0.1  | 0.2  |
|          | LIBI5                     | <i>Linum bienne</i>                                 | 43  | 0.2  | 0.1  | 0.2  |
|          | HYGL2                     | <i>Hypochaeris glabra</i>                           | 29  | 9.1  | 0.2  | 18.0 |
|          | IRDO                      | <i>Iris douglasiana</i>                             | 29  | 9.1  | 0.2  | 18.0 |
|          | 2DAPI                     | <i>Danthonia pilosa</i>                             | 29  | 4.1  | 0.2  | 8.0  |
|          | AVBA                      | <i>Avena barbata</i>                                | 29  | 1.6  | 0.2  | 3.0  |
| BRCA5    | <i>Bromus carinatus</i>   | 29  | 1.6 | 0.2  | 3.0  |      |
| MOVI2    | <i>Monardella villosa</i> | 29  | 1.1 | 0.2  | 2.0  |      |

**STAND TABLE**

***Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Association**

n = 7

| Lifeform | Code   | Botanical Name             | Con | Avg | Min | Max |
|----------|--------|----------------------------|-----|-----|-----|-----|
| Herb     | HEMA80 | <i>Heracleum maximum</i>   | 29  | 0.2 | 0.2 | 0.2 |
|          | GEDI   | <i>Geranium dissectum</i>  | 29  | 0.2 | 0.2 | 0.2 |
|          | FRCH   | <i>Fragaria chiloensis</i> | 29  | 0.2 | 0.2 | 0.2 |

***Holcus lanatus* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (8) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 73.1         | 30–95         | –          |
| Herb                          | 71.9         | 30–95         | <0.5–0.5   |
| Shrub                         | 0.6          | 0–2           | <0.5–0.5   |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (2), SW (4)

**Macrotopography:** lower 1/3 of slope (2), middle 1/3 of slope (2), ridge top (1), upper 1/3 of slope (3)

**Microtopography:** concave (1), convex (1), flat (5), undulating (1)

**Parent material:** Franciscan melange (1), granitic (1), igneous (1), metasedimentary (4), sedimentary (1)

**Soil texture:** clay or clay loam (6), sand (1)

**Slope steepness:** gentle/1-5° (3), moderate/6-25° (5)

|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 338 ft. | 136–695 ft. |
| Slope             | 9.0°    | 1–17°       |
| Large rock cover  | 0.2%    | 0–1%        |
| Small rock cover  | 0.3%    | 0–1%        |
| Bare ground cover | 15.8%   | 1–72%       |
| Litter cover      | 71.5%   | 25–89%      |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** none

**Relevés:** HEAD0006, HEAD0117, HEAD0164, HEAD0283, HEAD0321, HEAD0326, SONO0441, SONO2182

**SCV Global/State Rank:** Not ranked – semi-natural association.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Holcus lanatus* Semi-Natural Association**

n = 8

| <b>Lifeform</b> | <b>Code</b>                | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|----------------------------|--|------------|------------|------------|------------|
| <b>Shrub</b>    | RUUR                       | <i>Rubus ursinus</i>                             | 25         | 5.5        | 3.0        | 8.0        |
|                 | BAPI                       | <i>Baccharis pilularis</i>                       | 25         | 0.6        | 0.2        | 1.0        |
| <b>Herb</b>     | HOLA                       | <i>Holcus lanatus</i>                            | 100        | 63.4       | 8.0        | 88.0       |
|                 | RUAC3                      | <i>Rumex acetosella</i>                          | 75         | 4.1        | 0.2        | 18.0       |
|                 | PLLA                       | <i>Plantago lanceolata</i>                       | 63         | 4.1        | 0.1        | 11.0       |
|                 | BRMA                       | <i>Briza maxima</i>                              | 63         | 1.3        | 0.2        | 3.0        |
|                 | CIVU                       | <i>Cirsium vulgare</i>                           | 63         | 1.3        | 0.1        | 3.0        |
|                 | GEDI                       | <i>Geranium dissectum</i>                        | 63         | 0.2        | 0.2        | 0.2        |
|                 | HYRA3                      | <i>Hypochaeris radicata</i>                      | 50         | 2.7        | 0.2        | 10.0       |
|                 | VUBR                       | <i>Vulpia bromoides</i>                          | 50         | 2.6        | 0.2        | 7.0        |
|                 | SOAS                       | <i>Sonchus asper</i>                             | 50         | 0.9        | 0.2        | 3.0        |
|                 | CAPY2                      | <i>Carduus pycnocephalus</i>                     | 50         | 0.9        | 0.2        | 3.0        |
|                 | ANAR                       | <i>Anagallis arvensis</i>                        | 50         | 0.4        | 0.2        | 1.0        |
|                 | VITE                       | <i>Vicia tetrasperma</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|                 | LIBI5                      | <i>Linum bienne</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|                 | CYEC                       | <i>Cynosurus echinatus</i>                       | 38         | 2.8        | 0.2        | 8.0        |
|                 | NAPU4                      | <i>Nassella pulchra</i>                          | 38         | 2.1        | 0.2        | 3.0        |
|                 | AVBA                       | <i>Avena barbata</i>                             | 38         | 1.1        | 0.2        | 3.0        |
|                 | TRDU2                      | <i>Trifolium dubium</i>                          | 38         | 1.1        | 0.2        | 3.0        |
|                 | VISA                       | <i>Vicia sativa</i>                              | 38         | 1.1        | 0.2        | 3.0        |
|                 | TRSU3                      | <i>Trifolium subterraneum</i>                    | 38         | 0.2        | 0.2        | 0.2        |
|                 | NAMA7                      | <i>Nassella manicata</i>                         | 25         | 19.1       | 0.2        | 38.0       |
|                 | PTAQP2                     | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 25         | 10.0       | 8.0        | 12.0       |
|                 | CATU3                      | <i>Carex tumulicola</i>                          | 25         | 5.5        | 3.0        | 8.0        |
|                 | POPR                       | <i>Poa pratensis</i>                             | 25         | 5.5        | 3.0        | 8.0        |
|                 | STRIR3                     | <i>Stachys rigida</i> var. <i>rigida</i>         | 25         | 4.1        | 0.2        | 8.0        |
|                 | COAR4                      | <i>Convolvulus arvensis</i>                      | 25         | 1.6        | 0.2        | 3.0        |
|                 | 2DAPI                      | <i>Danthonia pilosa</i>                          | 25         | 1.6        | 0.2        | 3.0        |
|                 | DACA3                      | <i>Danthonia californica</i>                     | 25         | 1.6        | 0.2        | 3.0        |
|                 | DAGL                       | <i>Dactylis glomerata</i>                        | 25         | 1.6        | 0.2        | 3.0        |
|                 | CAPU18                     | <i>Calystegia purpurata</i>                      | 25         | 1.6        | 0.2        | 3.0        |
|                 | BRMI2                      | <i>Briza minor</i>                               | 25         | 1.6        | 0.2        | 3.0        |
|                 | ACMI2                      | <i>Achillea millefolium</i>                      | 25         | 1.6        | 0.2        | 3.0        |
|                 | AICA                       | <i>Aira caryophyllea</i>                         | 25         | 1.6        | 0.2        | 3.0        |
|                 | BRDI3                      | <i>Bromus diandrus</i>                           | 25         | 0.6        | 0.2        | 1.0        |
|                 | VICIA                      | <i>Vicia</i>                                     | 25         | 0.2        | 0.2        | 0.2        |
| BRCA5           | <i>Bromus carinatus</i>    | 25   | 0.2        | 0.2        | 0.2        |            |
| CAGY3           | <i>Carex gynodynamis</i>   | 25   | 0.2        | 0.2        | 0.2        |            |
| JUPA2           | <i>Juncus patens</i>       | 25   | 0.2        | 0.2        | 0.2        |            |
| GAAP2           | <i>Galium aparine</i>      | 25   | 0.2        | 0.2        | 0.2        |            |
| SIBE            | <i>Sisyrinchium bellum</i> | 25   | 0.2        | 0.2        | 0.2        |            |
| ELGL            | <i>Elymus glaucus</i>      | 25   | 0.2        | 0.2        | 0.2        |            |

**Noteworthy Taxa**

*Sidalcea calycosa* ssp. *rhizomata*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T2/S2



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## ***Hordeum brachyantherum* Alliance**

### **Meadow barley patches**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Hordeum brachyantherum* is dominant or co-dominant in the herbaceous layer with *Carex* spp., *Danthonia californica*, *Deschampsia cespitosa*, *Deschampsia danthonioides*, *Eleocharis acicularis*, *Epilobium ciliatum*, *Epilobium halleanum*, *Holcus lanatus*, *Juncus arcticus*, *Juncus phaeocephalus*, *Lolium perenne*, *Lotus* spp., *Medicago polymorpha*, *Muhlenbergia filiformis*, *Poa palustris*, *Poa pratensis*, *Ranunculus californicus*, *Rumex* spp., *Senecio triangularis*, and *Trifolium* spp.

*Hordeum brachyantherum* occurs in temperate Eurasia and North America and includes two subspecies: the larger, ssp. *brachyantherum*, is widespread; the less robust, ssp. *californicum*, grows only in California, below 500 m, on and off serpentine (Von Bothmer et al. 2007). Both forms are included in this alliance. The *Hordeum brachyantherum* Alliance is also found in the mountains of Idaho and Nevada (NatureServe 2007a). California stands tend to occur in moist meadows or swales within a matrix of wetland to mesic herbaceous and woody vegetation types. *H. brachyantherum* has a broad temperature tolerance, enabling stands to exist adjacent to a divergent array of wetland alliances. However, this alliance is not well-known for the state, and its ecological similarity to other wetland alliances needs study.

#### Sonoma County

*Hordeum brachyantherum* stands are widely distributed from the coast to inland areas in the county. Inland stands are associated with low-lying seeps and swales, while coastal stands may occur on foggy bluffs. Some stands are heavily grazed. Most stands are small (< 1 ha).

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#### **Local Alliance Summary (n = 5)**

**Elevation:** 49–1015 ft, mean 411 ft

**SCV Global/State Rank:** G4/S3?<sup>2</sup>

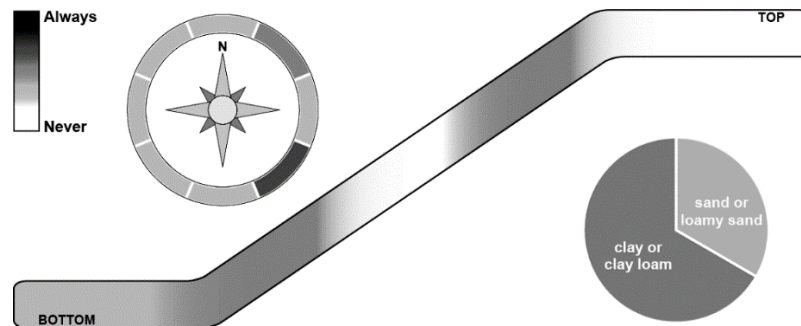
#### **Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 62.0         | 15–95         | –          |
| <b>Herb</b>                          | 63.0         | 15–95         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 2.3°  | 0–4°   |
| <b>Large rock cover</b>  | 0.2%  | 0–1%   |
| <b>Small rock cover</b>  | 0.4%  | 0–1%   |
| <b>Bare ground cover</b> | 8.8%  | 0–38%  |
| <b>Litter cover</b>      | 78.8% | 60–96% |

**Associations within this Alliance:**

*Hordeum brachyantherum* Association

**STAND TABLE**

***Hordeum brachyantherum* Alliance**

n = 5

| Lifeform | Code   | Botanical Name   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     |        |  |     |      |      |      |
|          | LOPE   | <i>Lolium perenne</i>                                    | 100 | 26.2 | 0.2  | 68.0 |
|          | HOBRC2 | * <i>Hordeum brachyantherum</i>                          | 80  | 24.0 | 18.0 | 40.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                                 | 80  | 0.4  | 0.2  | 1.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                            | 60  | 6.1  | 0.2  | 18.0 |
|          | TRDU2  | <i>Trifolium dubium</i>                                  | 60  | 0.2  | 0.2  | 0.2  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>           | 40  | 5.0  | 2.0  | 8.0  |
|          | VISA   | <i>Vicia sativa</i>                                      | 40  | 4.1  | 0.2  | 8.0  |
|          | JUOC2  | <i>Juncus occidentalis</i>                               | 40  | 3.0  | 3.0  | 3.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                                  | 40  | 1.6  | 0.2  | 3.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                                | 40  | 0.2  | 0.2  | 0.2  |
|          | CYEC   | <i>Cynosurus echinatus</i>                               | 40  | 0.2  | 0.2  | 0.2  |
|          | DACA3  | <i>Danthonia californica</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|          | LASA   | <i>Lactuca saligna</i>                                   | 40  | 0.2  | 0.2  | 0.2  |
|          | LYHY3  | <i>Lythrum hyssopifolium</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                               | 40  | 0.2  | 0.2  | 0.2  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>        | 40  | 0.2  | 0.1  | 0.2  |
|          | LOCO6  | <i>Lotus corniculatus</i>                                | 20  | 68.0 | 68.0 | 68.0 |
|          | BRCA5  | <i>Bromus carinatus</i>                                  | 20  | 18.0 | 18.0 | 18.0 |
|          | HYRA3  | <i>Hypochaeris radicata</i>                              | 20  | 18.0 | 18.0 | 18.0 |
|          | PLER3  | <i>Plantago erecta</i>                                   | 20  | 18.0 | 18.0 | 18.0 |
|          | HOBRC2 | * <i>Hordeum brachyantherum</i> ssp. <i>californicum</i> | 20  | 8.0  | 8.0  | 8.0  |
|          | LUVE   | <i>Lupinus versicolor</i>                                | 20  | 8.0  | 8.0  | 8.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Hordeum brachyantherum* Alliance**

n = 5

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                  | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | PIEC        | <i>Picris echioides</i>                                | 20         | 8.0        | 8.0        | 8.0        |
|                 | AICA        | <i>Aira caryophylla</i>                                | 20         | 3.0        | 3.0        | 3.0        |
|                 | AIPR        | <i>Aira praecox</i>                                    | 20         | 3.0        | 3.0        | 3.0        |
|                 | BETR        | <i>Bellardia trixago</i>                               | 20         | 3.0        | 3.0        | 3.0        |
|                 | COAR4       | <i>Convolvulus arvensis</i>                            | 20         | 3.0        | 3.0        | 3.0        |
|                 | DIDO3       | <i>Dichondra donelliana</i>                            | 20         | 3.0        | 3.0        | 3.0        |
|                 | FEID        | <i>Festuca idahoensis</i>                              | 20         | 3.0        | 3.0        | 3.0        |
|                 | FRCH        | <i>Fragaria chiloensis</i>                             | 20         | 3.0        | 3.0        | 3.0        |
|                 | JUNCU       | <i>Juncus</i>  | 20         | 3.0        | 3.0        | 3.0        |
|                 | LACA7       | <i>Lasthenia californica</i>                           | 20         | 3.0        | 3.0        | 3.0        |
|                 | MEPO3       | <i>Medicago polymorpha</i>                             | 20         | 3.0        | 3.0        | 3.0        |
|                 | PAVI3       | <i>Parentucellia viscosa</i>                           | 20         | 3.0        | 3.0        | 3.0        |
|                 | TRIFO       | <i>Trifolium</i>                                       | 20         | 3.0        | 3.0        | 3.0        |
|                 | TRRE3       | <i>Trifolium repens</i>                                | 20         | 2.0        | 2.0        | 2.0        |
|                 | PLCOC       | <i>Plagiobothrys collinus</i> var. <i>californicus</i> | 20         | 1.0        | 1.0        | 1.0        |
|                 | RUMEX       | <i>Rumex</i>   | 20         | 1.0        | 1.0        | 1.0        |
|                 | AGROS2      | <i>Agrostis</i>  | 20         | 0.2        | 0.2        | 0.2        |
|                 | ALPR3       | <i>Alopecurus pratensis</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>                                     | 20         | 0.2        | 0.2        | 0.2        |
|                 | CAPU18      | <i>Calystegia purpurata</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                 | CASUS2      | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>    | 20         | 0.2        | 0.2        | 0.2        |
|                 | CEGL2       | <i>Cerastium glomeratum</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                 | CIQU2       | <i>Cirsium quercetorum</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                 | CLDA        | <i>Clarkia davyi</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                 | DAPU3       | <i>Daucus pusillus</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                 | DISP        | <i>Distichlis spicata</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                 | ELGL        | <i>Elymus glaucus</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                 | GAPU3       | <i>Gamochaeta purpurea</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                 | GEDI        | <i>Geranium dissectum</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                 | HEMIZ       | <i>Hemizonia</i>                                       | 20         | 0.2        | 0.2        | 0.2        |
|                 | HOLA        | <i>Holcus lanatus</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                 | JUAR2       | <i>Juncus arcticus</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                 | JUBU        | <i>Juncus bufonius</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                 | JUXI        | <i>Juncus xiphioides</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                 | LAHI2       | <i>Lathyrus hirsutus</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                 | LOTUS       | <i>Lotus</i>   | 20         | 0.2        | 0.2        | 0.2        |
|                 | LOWR2       | <i>Lotus wrangelianus</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                 | MYDI        | <i>Myosotis discolor</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                 | NAPU4       | <i>Nassella pulchra</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                 | PAAN4       | <i>Panicum antidotale</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                 | PLLA        | <i>Plantago lanceolata</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                 | RACA2       | <i>Ranunculus californicus</i>                         | 20         | 0.2        | 0.2        | 0.2        |
|                 | RAMU2       | <i>Ranunculus muricatus</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                 | RUAC3       | <i>Rumex acetosella</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                 | RUPU3       | <i>Rumex pulcher</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                 | SHAR2       | <i>Sherardia arvensis</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                 | SIMA2       | <i>Sidalcea malviflora</i>                             | 20         | 0.2        | 0.2        | 0.2        |

**STAND TABLE** continued

***Hordeum brachyantherum* Alliance**

n = 5

| Lifeform | Code   | Botanical Name                                 | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Herb     | SIGA   | <i>Silene gallica</i>                          | 20  | 0.2 | 0.2 | 0.2 |
|          | SOSE2  | <i>Soliva sessilis</i>                         | 20  | 0.2 | 0.2 | 0.2 |
|          | TRBI   | <i>Trifolium bifidum</i>                       | 20  | 0.2 | 0.2 | 0.2 |
|          | TRGL4  | <i>Trifolium glomeratum</i>                    | 20  | 0.2 | 0.2 | 0.2 |
|          | TRHI4  | <i>Trifolium hirtum</i>                        | 20  | 0.2 | 0.2 | 0.2 |
|          | TRMA2  | <i>Trifolium macraei</i>                       | 20  | 0.2 | 0.2 | 0.2 |
|          | TRMI5  | <i>Trifolium microdon</i>                      | 20  | 0.2 | 0.2 | 0.2 |
|          | VERON  | <i>Veronica</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|          | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i> | 20  | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Hordeum brachyantherum* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2), Coastal Hills-Santa Rosa Plain/263Aj (2), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 62.0         | 15–95         | –          |
| <b>Herb</b>                          | 63.0         | 15–95         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** Flat (1), NE (1), SE (2)

**Macrotopography:** bottom (1), lower 1/3 of slope (2), upper 1/3 of slope (2)

**Microtopography:** concave (1), flat (4)

**Parent material:** sandstone (1), sedimentary (2), ultramafic (1), volcanic (1)

**Soil texture:** clay or clay loam (2), sand (1)

**Slope steepness:** flat/0° (1), gentle/1–5° (3)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 411 ft. | 49–1015 ft. |
| <b>Slope</b>             | 2.3°    | 0–4°        |
| <b>Large rock cover</b>  | 0.2%    | 0–1%        |
| <b>Small rock cover</b>  | 0.4%    | 0–1%        |
| <b>Bare ground cover</b> | 8.8%    | 0–38%       |
| <b>Litter cover</b>      | 78.8%   | 60–96%      |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** none

**Relevés:** HEAD0150, HEAD0204, HEAD0353, SONO0680, SONO0746

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

**STAND TABLE**

***Hordeum brachyantherum* Association**

n = 5

| Lifeform | Code   | Botanical Name   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     |        |  |     |      |      |      |
|          | LOPE   | <i>Lolium perenne</i>                                    | 100 | 26.2 | 0.2  | 68.0 |
|          | HOBRC2 | * <i>Hordeum brachyantherum</i>                          | 80  | 24.0 | 18.0 | 40.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                                 | 80  | 0.4  | 0.2  | 1.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                            | 60  | 6.1  | 0.2  | 18.0 |
|          | TRDU2  | <i>Trifolium dubium</i>                                  | 60  | 0.2  | 0.2  | 0.2  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>           | 40  | 5.0  | 2.0  | 8.0  |
|          | VISA   | <i>Vicia sativa</i>                                      | 40  | 4.1  | 0.2  | 8.0  |
|          | JUOC2  | <i>Juncus occidentalis</i>                               | 40  | 3.0  | 3.0  | 3.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                                  | 40  | 1.6  | 0.2  | 3.0  |
|          | LASA   | <i>Lactuca saligna</i>                                   | 40  | 0.2  | 0.2  | 0.2  |
|          | LYHY3  | <i>Lythrum hyssopifolium</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|          | CYEC   | <i>Cynosurus echinatus</i>                               | 40  | 0.2  | 0.2  | 0.2  |
|          | DACA3  | <i>Danthonia californica</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                               | 40  | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                                | 40  | 0.2  | 0.2  | 0.2  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>        | 40  | 0.2  | 0.1  | 0.2  |
|          | LOCO6  | <i>Lotus corniculatus</i>                                | 20  | 68.0 | 68.0 | 68.0 |
|          | HYRA3  | <i>Hypochaeris radicata</i>                              | 20  | 18.0 | 18.0 | 18.0 |
|          | PLER3  | <i>Plantago erecta</i>                                   | 20  | 18.0 | 18.0 | 18.0 |
|          | BRCA5  | <i>Bromus carinatus</i>                                  | 20  | 18.0 | 18.0 | 18.0 |
|          | LUVE   | <i>Lupinus versicolor</i>                                | 20  | 8.0  | 8.0  | 8.0  |
|          | PIEC   | <i>Picris echioides</i>                                  | 20  | 8.0  | 8.0  | 8.0  |
|          | HOBRC2 | * <i>Hordeum brachyantherum</i> ssp. <i>californicum</i> | 20  | 8.0  | 8.0  | 8.0  |
|          | MEPO3  | <i>Medicago polymorpha</i>                               | 20  | 3.0  | 3.0  | 3.0  |
|          | TRIFO  | <i>Trifolium</i>   | 20  | 3.0  | 3.0  | 3.0  |
|          | FRCH   | <i>Fragaria chiloensis</i>                               | 20  | 3.0  | 3.0  | 3.0  |
|          | PAVI3  | <i>Parentucellia viscosa</i>                             | 20  | 3.0  | 3.0  | 3.0  |
|          | JUNCU  | <i>Juncus</i>  | 20  | 3.0  | 3.0  | 3.0  |
|          | FEID   | <i>Festuca idahoensis</i>                                | 20  | 3.0  | 3.0  | 3.0  |
|          | DIDO3  | <i>Dichondra donelliana</i>                              | 20  | 3.0  | 3.0  | 3.0  |
|          | COAR4  | <i>Convolvulus arvensis</i>                              | 20  | 3.0  | 3.0  | 3.0  |
|          | BETR   | <i>Bellardia trixago</i>                                 | 20  | 3.0  | 3.0  | 3.0  |
|          | AIPR   | <i>Aira praecox</i>                                      | 20  | 3.0  | 3.0  | 3.0  |
|          | LACA7  | <i>Lasthenia californica</i>                             | 20  | 3.0  | 3.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE** continued

***Hordeum brachyantherum* Association**

n = 5

| <b>Lifeform</b><br><b>Herb</b> | <b>Code</b> | <b>Botanical Name</b>                                  | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--------------------------------|-------------|--|------------|------------|------------|------------|
|                                | AICA        | <i>Aira caryophyllea</i>                               | 20         | 3.0        | 3.0        | 3.0        |
|                                | TRRE3       | <i>Trifolium repens</i>                                | 20         | 2.0        | 2.0        | 2.0        |
|                                | PLCOC       | <i>Plagiobothrys collinus</i> var. <i>californicus</i> | 20         | 1.0        | 1.0        | 1.0        |
|                                | RUMEX       | <i>Rumex</i>   | 20         | 1.0        | 1.0        | 1.0        |
|                                | CAPU18      | <i>Calystegia purpurata</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                                | BRMI2       | <i>Briza minor</i>                                     | 20         | 0.2        | 0.2        | 0.2        |
|                                | ALPR3       | <i>Alopecurus pratensis</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                                | AGROS2      | <i>Agrostis</i>  | 20         | 0.2        | 0.2        | 0.2        |
|                                | CASUS2      | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>    | 20         | 0.2        | 0.2        | 0.2        |
|                                | HEMIZ       | <i>Hemizonia</i>                                       | 20         | 0.2        | 0.2        | 0.2        |
|                                | LOWR2       | <i>Lotus wrangelianus</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | LOTUS       | <i>Lotus</i>   | 20         | 0.2        | 0.2        | 0.2        |
|                                | LAHI2       | <i>Lathyrus hirsutus</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                                | JUXI        | <i>Juncus xiphioides</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                                | JUBU        | <i>Juncus bufonius</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                                | MYDI        | <i>Myosotis discolor</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                                | HOLA        | <i>Holcus lanatus</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                                | GAPU3       | <i>Gamochaeta purpurea</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                                | ELGL        | <i>Elymus glaucus</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                                | DISP        | <i>Distichlis spicata</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | DAPU3       | <i>Daucus pusillus</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                                | CLDA        | <i>Clarkia davyi</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                                | CEGL2       | <i>Cerastium glomeratum</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                                | CIQU2       | <i>Cirsium quercetorum</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                                | JUAR2       | <i>Juncus arcticus</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                                | SHAR2       | <i>Sherardia arvensis</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | TRMI5       | <i>Trifolium microdon</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | TRMA2       | <i>Trifolium macraei</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                                | TRHI4       | <i>Trifolium hirtum</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                                | TRGL4       | <i>Trifolium glomeratum</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                                | TRBI        | <i>Trifolium bifidum</i>                               | 20         | 0.2        | 0.2        | 0.2        |
|                                | RAMU2       | <i>Ranunculus muricatus</i>                            | 20         | 0.2        | 0.2        | 0.2        |
|                                | VERON       | <i>Veronica</i>  | 20         | 0.2        | 0.2        | 0.2        |
|                                | NAPU4       | <i>Nassella pulchra</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                                | SOSE2       | <i>Soliva sessilis</i>                                 | 20         | 0.2        | 0.2        | 0.2        |
|                                | RUPU3       | <i>Rumex pulcher</i>                                   | 20         | 0.2        | 0.2        | 0.2        |
|                                | RUAC3       | <i>Rumex acetosella</i>                                | 20         | 0.2        | 0.2        | 0.2        |
|                                | GED1        | <i>Geranium dissectum</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | RACA2       | <i>Ranunculus californicus</i>                         | 20         | 0.2        | 0.2        | 0.2        |
|                                | PLLA        | <i>Plantago lanceolata</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                                | PAAN4       | <i>Panicum antidotale</i>                              | 20         | 0.2        | 0.2        | 0.2        |
|                                | SIGA        | <i>Silene gallica</i>                                  | 20         | 0.2        | 0.2        | 0.2        |
|                                | SIMA2       | <i>Sidalcea malviflora</i>                             | 20         | 0.2        | 0.2        | 0.2        |
|                                | HECOC2      | <i>Hemizonia congesta</i> ssp. <i>congesta</i>         | 20         | 0.1        | 0.1        | 0.1        |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

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## ***Juncus (effusus, patens)* Provisional Alliance**

### **Soft and western rush marshes**

Statewide (Sawyer et al. 2009)

*Juncus effusus* and/or *J. patens* dominate in the herbaceous layer with *Argentina egedii*, *Bromus tectorum*, *Carex* spp., *Cirsium vulgare*, *Epilobium ciliatum*, *Helminthotheca echioides*, *Holcus lanatus*, *Juncus arcticus*, *Juncus bufonius*, *Juncus lescurii*, *Juncus phaeocephalus*, *Lactuca serriola*, *Lolium perenne*, *Luzula comosa*, *Senecio minimus*, *Trifolium* spp., *Typha latifolia*, and *Urtica dioica*. Emergent shrubs may be present at low cover, including *Baccharis pilularis* or *Rubus armeniacus*.

Several *Juncus* species overlap ecologically in moist coastal terraces, seeps, and pond edges along the northern and central coast of California. *Juncus effusus* and *J. patens* overlap geographically and tend to be the most common stand formers, perhaps due to their tolerance of relatively heavy cattle browsing. However, *Juncus phaeocephalus*, *J. occidentalis*, and other *Juncus* species may also occur in similar settings.

#### Sonoma County

Stands of this alliance occur throughout the county in seeps, springs, and moist coastal terraces, from the coast to more than 60 km inland. Many *Juncus (effusus, patens)* stands overlap with stands of the *Holcus lanatus* – *Anthoxanthum odoratum* Semi-Natural Alliance.

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#### **Local Alliance Summary (n = 24)**

**Elevation:** 68–2036 ft, mean 718 ft

**SCV Global/State Rank:** G4/S4?<sup>1</sup>

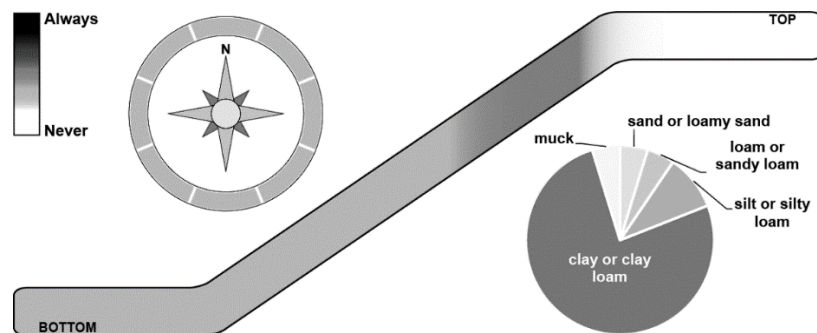
#### **Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 69.9         | 14–95         | –          |
| <b>Herb</b>                          | 70.5         | 14–95         | <0.5–2     |
| <b>Shrub</b>                         | 0.4          | 0–5           | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 7.8°  | 0–30° |
| <b>Large rock cover</b>  | 0.5%  | 0–5%  |
| <b>Small rock cover</b>  | 0.2%  | 0–1%  |
| <b>Bare ground cover</b> | 10.9% | 0–77% |
| <b>Litter cover</b>      | 56.0% | 0–94% |

**Associations within this Alliance:**

- Juncus effusus* Association
- Juncus patens* – *Holcus lanatus* Provisional Association
- Juncus patens* – *Juncus occidentalis* Provisional Association
- Juncus patens* Provisional Association
- Juncus phaeocephalus* Provisional Association

**STAND TABLE**

***Juncus (effusus, patens)* Provisional Alliance**

n = 24

| Lifeform     | Code  | Botanical Name                | Con | Avg  | Min | Max  |
|--------------|-------|-------------------------------|-----|------|-----|------|
| <b>Shrub</b> |       |                               |     |      |     |      |
|              | RUUR  | <i>Rubus ursinus</i>          | 21  | 5.9  | 0.2 | 18.0 |
| <b>Herb</b>  |       |                               |     |      |     |      |
|              | HOLA  | <i>Holcus lanatus</i>         | 67  | 17.6 | 0.2 | 68.0 |
|              | JUPA2 | <i>Juncus patens</i>          | 58  | 21.5 | 0.2 | 53.0 |
|              | CADE8 | <i>Carex densa</i>            | 58  | 6.1  | 0.2 | 18.0 |
|              | LOPE  | <i>Lolium perenne</i>         | 58  | 3.3  | 0.2 | 18.0 |
|              | BRMI2 | <i>Briza minor</i>            | 54  | 0.4  | 0.2 | 3.0  |
|              | PLLA  | <i>Plantago lanceolata</i>    | 50  | 6.1  | 0.2 | 18.0 |
|              | LIBI5 | <i>Linum bienne</i>           | 50  | 0.7  | 0.2 | 3.0  |
|              | DACA3 | <i>Danthonia californica</i>  | 46  | 7.4  | 0.2 | 38.2 |
|              | VUBR  | <i>Vulpia bromoides</i>       | 46  | 6.1  | 0.2 | 18.0 |
|              | JUBU  | <i>Juncus bufonius</i>        | 46  | 4.1  | 0.2 | 8.0  |
|              | CYEC  | <i>Cynosurus echinatus</i>    | 46  | 2.8  | 0.2 | 18.0 |
|              | TRDU2 | <i>Trifolium dubium</i>       | 46  | 1.0  | 0.2 | 3.0  |
|              | GEDI  | <i>Geranium dissectum</i>     | 46  | 0.7  | 0.1 | 3.0  |
|              | TRSU3 | <i>Trifolium subterraneum</i> | 42  | 2.9  | 0.2 | 8.0  |
|              | JUPH  | <i>Juncus phaeocephalus</i>   | 38  | 14.9 | 0.2 | 38.0 |
|              | JUOC2 | <i>Juncus occidentalis</i>    | 38  | 12.9 | 0.1 | 38.0 |
|              | MEPU  | <i>Mentha pulegium</i>        | 38  | 6.7  | 0.2 | 38.0 |
|              | BRHO2 | <i>Bromus hordeaceus</i>      | 38  | 3.9  | 0.2 | 25.0 |
|              | LOAN2 | <i>Lotus angustissimus</i>    | 38  | 3.7  | 0.2 | 8.0  |
|              | CIVU  | <i>Cirsium vulgare</i>        | 38  | 0.4  | 0.2 | 2.0  |

**STAND TABLE** continued

***Juncus (effusus, patens)* Provisional Alliance**

n = 24

| Lifeform | Code  | Botanical Name                                 | Con | Avg  | Min | Max  |
|----------|-------|--|-----|------|-----|------|
| Herb     |       |  |     |      |     |      |
|          | RUAC3 | <i>Rumex acetosella</i>                        | 33  | 6.1  | 0.2 | 38.0 |
|          | RACA2 | <i>Ranunculus californicus</i>                 | 33  | 4.7  | 0.2 | 18.0 |
|          | SIBE  | <i>Sisyrinchium bellum</i>                     | 33  | 1.5  | 0.2 | 8.0  |
|          | AICA  | <i>Aira caryophyllea</i>                       | 33  | 0.3  | 0.2 | 1.0  |
|          | ANAR  | <i>Anagallis arvensis</i>                      | 33  | 0.2  | 0.2 | 0.2  |
|          | JUEFP | <i>Juncus effusus</i> var. <i>pacificus</i>    | 29  | 19.2 | 0.2 | 50.0 |
|          | CAGY3 | <i>Carex gynodynama</i>                        | 29  | 6.5  | 0.2 | 18.0 |
|          | HOMAG | <i>Hordeum marinum</i> ssp. <i>gussonianum</i> | 29  | 6.3  | 0.2 | 38.0 |
|          | LETA  | <i>Leontodon taraxacoides</i>                  | 25  | 12.2 | 3.0 | 18.0 |
|          | HYRA3 | <i>Hypochaeris radicata</i>                    | 25  | 7.5  | 0.2 | 18.0 |
|          | ISCA6 | <i>Isolepis carinata</i>                       | 25  | 0.2  | 0.2 | 0.2  |
|          | LYHY3 | <i>Lythrum hyssopifolium</i>                   | 25  | 0.2  | 0.2 | 0.2  |
|          | CATU3 | <i>Carex tumulicola</i>                        | 21  | 5.3  | 0.2 | 18.0 |
|          | ELGL  | <i>Elymus glaucus</i>                          | 21  | 0.3  | 0.1 | 1.0  |
|          | VISA  | <i>Vicia sativa</i>                            | 21  | 0.2  | 0.2 | 0.4  |
|          | RUPU3 | <i>Rumex pulcher</i>                           | 21  | 0.2  | 0.2 | 0.2  |
|          | CEGL2 | <i>Cerastium glomeratum</i>                    | 21  | 0.2  | 0.1 | 0.2  |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Juncus effusus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 66.0         | 62–70         | –          |
| <b>Herb</b>                          | 66.0         | 62–70         | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SW (2)

**Macrotopography:** upper 1/3 of slope (2)

**Microtopography:** flat (2)

**Parent material:** andesite (1), metasedimentary (1)

**Soil texture:** clay or clay loam (1), silt or silt loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 745 ft. | 721–768 ft. |
| Slope             | 4.0°    | 2–6°        |
| Large rock cover  | 0.1%    | 0–0.2%      |
| Small rock cover  | 0.0%    | 0–0%        |
| Bare ground cover | 23.0%   | 20–26%      |
| Litter cover      | 40.0%   | 10–70%      |

**Samples Used to Describe Association (n=2)**

Rapid Assessments: SONO0185

Relevés: SONO0405

SCV Global/State Rank: G4?/S3?<sup>1</sup>

**STAND TABLE**

***Juncus effusus* Association**

n = 2

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>      | 100 | 32.5 | 15.0 | 50.0 |
|          | CAREX  | <i>Carex</i>                                     | 50  | 21.0 | 21.0 | 21.0 |
|          | SICA8  | <i>Sisyrinchium californicum</i>                 | 50  | 20.0 | 20.0 | 20.0 |
|          | CAPR5  | <i>Carex praegracilis</i>                        | 50  | 9.0  | 9.0  | 9.0  |
|          | HEBI   | <i>Helenium bigelovii</i>                        | 50  | 8.0  | 8.0  | 8.0  |
|          | DECE   | <i>Deschampsia cespitosa</i>                     | 50  | 8.0  | 8.0  | 8.0  |
|          | MIGU   | <i>Mimulus guttatus</i>                          | 50  | 7.0  | 7.0  | 7.0  |
|          | HOLA   | <i>Holcus lanatus</i>                            | 50  | 5.0  | 5.0  | 5.0  |
|          | MEPU   | <i>Mentha pulegium</i>                           | 50  | 3.0  | 3.0  | 3.0  |
|          | CIVU   | <i>Cirsium vulgare</i>                           | 50  | 2.0  | 2.0  | 2.0  |
|          | COMA2  | <i>Conium maculatum</i>                          | 50  | 1.0  | 1.0  | 1.0  |
|          | PTAQP2 | <i>Pteridium aquilinum</i> var. <i>pubescens</i> | 50  | 0.2  | 0.2  | 0.2  |
|          | ANAGA  | <i>Anagallis</i>                                 | 50  | 0.2  | 0.2  | 0.2  |
|          | BRMI2  | <i>Briza minor</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|          | VITE   | <i>Vicia tetrasperma</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|          | VEAM2  | <i>Veronica americana</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|          | TRFR2  | <i>Trifolium fragiferum</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | CYDA   | <i>Cynodon dactylon</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|          | RUCR   | <i>Rumex crispus</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|          | JUNCU  | <i>Juncus</i>                                    | 50  | 0.2  | 0.2  | 0.2  |
|          | HYAN2  | <i>Hypericum anagalloides</i>                    | 50  | 0.2  | 0.2  | 0.2  |
|          | EPCI   | <i>Epilobium ciliatum</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|          | ELAC   | <i>Eleocharis acicularis</i>                     | 50  | 0.2  | 0.2  | 0.2  |
|          | BRDI3  | <i>Bromus diandrus</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|          | CYNI2  | <i>Cyperus niger</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|          | LEMI3  | <i>Lemna minor</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|          | LYHY3  | <i>Lythrum hyssopifolium</i>                     | 50  | 0.2  | 0.2  | 0.2  |
|          | SOOL   | <i>Sonchus oleraceus</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|          | CYER   | <i>Cyperus eragrostis</i>                        | 50  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Juncus effusus* Association**

n = 2

| Lifeform | Code  | Botanical Name                  | Con | Avg | Min | Max |
|----------|-------|---------------------------------|-----|-----|-----|-----|
| Herb     |       |                                 |     |     |     |     |
|          | RUAC3 | <i>Rumex acetosella</i>         | 50  | 0.2 | 0.2 | 0.2 |
|          | COAR4 | <i>Convolvulus arvensis</i>     | 50  | 0.2 | 0.2 | 0.2 |
|          | CEMU2 | <i>Centaurium muehlenbergii</i> | 50  | 0.2 | 0.2 | 0.2 |
|          | CADE8 | <i>Carex densa</i>              | 50  | 0.2 | 0.2 | 0.2 |
|          | BRHO2 | <i>Bromus hordeaceus</i>        | 50  | 0.2 | 0.2 | 0.2 |
|          | NAPU4 | <i>Nassella pulchra</i>         | 50  | 0.2 | 0.2 | 0.2 |
|          | NAOF  | <i>Nasturtium officinale</i>    | 50  | 0.2 | 0.2 | 0.2 |
|          | GEMO  | <i>Geranium molle</i>           | 50  | 0.2 | 0.2 | 0.2 |
|          | MENTH | <i>Mentha</i>                   | 50  | 0.2 | 0.2 | 0.2 |

***Juncus patens* – *Holcus lanatus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 95.0         | 95–95         | –          |
| Herb                          | 90.0         | 80–95         | –          |
| Shrub                         | 2.0          | 0–5           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SE (1)

**Macrotopography:** middle 1/3 of slope (2)

**Microtopography:** concave (1), flat (2)

**Parent material:** metasedimentary (1), sedimentary (1)

**Soil texture:** clay or clay loam (2), silt or silt loam (1)

**Slope steepness:** flat/0° (1), gentle/1-5° (1), moderate/6-25° (1)

|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 205 ft. | 141–269 ft. |
| Slope             | 3.7°    | 0–7°        |
| Large rock cover  | 0.0%    | 0–0%        |
| Small rock cover  | 0.0%    | 0–0%        |
| Bare ground cover | 5.0%    | 0–10%       |
| Litter cover      | 67.7%   | 60–78%      |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** HEAD0156, HEAD0212, HEAD0389

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

SCV Global/State Rank: G4?/S4?<sup>1</sup>

**STAND TABLE**

***Juncus patens* – *Holcus lanatus* Provisional Association**

n = 3

| Lifeform | Code   | Botanical Name                              | Con | Avg  | Min  | Max  |
|----------|--|---|-----|------|------|------|
| Shrub    | BAPI   | <i>Baccharis pilularis</i>                  | 67  | 0.2  | 0.2  | 0.2  |
|          | RUUR   | <i>Rubus ursinus</i>                        | 33  | 8.0  | 8.0  | 8.0  |
| Herb     | HOLA   | <i>Holcus lanatus</i>                       | 100 | 48.0 | 38.0 | 68.0 |
|          | JUPA2  | <i>Juncus patens</i>                        | 100 | 31.3 | 18.0 | 38.0 |
|          | RUAC3  | <i>Rumex acetosella</i>                     | 100 | 14.7 | 3.0  | 38.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|          | CATU3  | <i>Carex tumulicola</i>                     | 67  | 9.1  | 0.2  | 18.0 |
|          | CYEC   | <i>Cynosurus echinatus</i>                  | 67  | 4.1  | 0.2  | 8.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                | 67  | 4.1  | 0.2  | 8.0  |
|          | LIBI5  | <i>Linum bienne</i>                         | 67  | 1.6  | 0.2  | 3.0  |
|          | GEDI   | <i>Geranium dissectum</i>                   | 67  | 1.6  | 0.2  | 3.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                    | 67  | 1.6  | 0.2  | 3.0  |
|          | DACA3  | <i>Danthonia californica</i>                | 67  | 0.2  | 0.2  | 0.2  |
|          | LOPE   | <i>Lolium perenne</i>                       | 67  | 0.2  | 0.2  | 0.2  |
|          | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i> | 33  | 18.0 | 18.0 | 18.0 |
|          | MYDI   | <i>Myosotis discolor</i>                    | 33  | 18.0 | 18.0 | 18.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                     | 33  | 18.0 | 18.0 | 18.0 |
|          | JUBU   | <i>Juncus bufonius</i>                      | 33  | 3.0  | 3.0  | 3.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>               | 33  | 3.0  | 3.0  | 3.0  |
|          | SCMI2  | <i>Scirpus microcarpus</i>                  | 33  | 3.0  | 3.0  | 3.0  |
|          | CAGY3  | <i>Carex gynodynema</i>                     | 33  | 3.0  | 3.0  | 3.0  |
|          | CADE8  | <i>Carex densa</i>                          | 33  | 3.0  | 3.0  | 3.0  |
|          | CAREX  | <i>Carex</i>                                | 33  | 3.0  | 3.0  | 3.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                     | 33  | 3.0  | 3.0  | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                          | 33  | 0.2  | 0.2  | 0.2  |
|          | VISA   | <i>Vicia sativa</i>                         | 33  | 0.2  | 0.2  | 0.2  |
|          | STRIR3   | <i>Stachys rigida</i> var. <i>rigida</i>    | 33  | 0.2  | 0.2  | 0.2  |
|          | SIDI   | <i>Sidalcea diploscypha</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|          | RUPU3  | <i>Rumex pulcher</i>                        | 33  | 0.2  | 0.2  | 0.2  |
|          | POA  | <i>Poa</i>                                  | 33  | 0.2  | 0.2  | 0.2  |
|          | MIMUL  | <i>Mimulus</i>                              | 33  | 0.2  | 0.2  | 0.2  |
|          | MIDO   | <i>Microseris douglasii</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|          | LOCO6  | <i>Lotus corniculatus</i>                   | 33  | 0.2  | 0.2  | 0.2  |
|          | HOBR2  | <i>Hordeum brachyantherum</i>               | 33  | 0.2  | 0.2  | 0.2  |
| GAAP2    | <i>Galium aparine</i>                          | 33  | 0.2 | 0.2  | 0.2  |      |
| ELGL     | <i>Elymus glaucus</i>                          | 33  | 0.2 | 0.2  | 0.2  |      |
| BRDI3    | <i>Bromus diandrus</i>                         | 33  | 0.2 | 0.2  | 0.2  |      |
| ANAR     | <i>Anagallis arvensis</i>                      | 33  | 0.2 | 0.2  | 0.2  |      |
| AICA     | <i>Aira caryophylla</i>                        | 33  | 0.2 | 0.2  | 0.2  |      |
| STBOS    | <i>Stellaria borealis</i> ssp. <i>sitchana</i> | 33  | 0.2 | 0.2  | 0.2  |      |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Juncus patens* – *Holcus lanatus* Provisional Association**

n = 3

| Lifeform | Code  | Botanical Name              | Con | Avg | Min | Max |
|----------|-------|-----------------------------|-----|-----|-----|-----|
| Herb     | CEGL2 | <i>Cerastium glomeratum</i> | 33  | 0.2 | 0.2 | 0.2 |
|          | SOAS  | <i>Sonchus asper</i>        | 33  | 0.1 | 0.1 | 0.1 |

***Juncus patens* – *Juncus occidentalis* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2), Coastal Hills-Santa Rosa Plain/263Aj (4), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 78.6         | 45–90         | –          |
| <b>Herb</b>                          | 79.3         | 50–90         | 0.5–1      |
| <b>Shrub</b>                         | 0.1          | 0–1           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (3), SW (2)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (5)

**Microtopography:** concave (4), convex (1), flat (2)

**Parent material:** metasedimentary (5), sandstone (1), sedimentary (1)

**Soil texture:** clay or clay loam (5), loam or sandy loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (4), steep/>25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 705 ft. | 156–1076 ft. |
| <b>Slope</b>             | 12.6°   | 1–30°        |
| <b>Large rock cover</b>  | 0.2%    | 0–1%         |
| <b>Small rock cover</b>  | 0.4%    | 0–1%         |
| <b>Bare ground cover</b> | 3.9%    | 1–10%        |
| <b>Litter cover</b>      | 61.4%   | 5–94%        |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** none

**Relevés:** HEAD0262, HEAD0275, HEAD0293, HEAD0334, HEAD0354, HEAD0420, SONO0745

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Juncus patens* – *Juncus occidentalis* Provisional Association**

n = 7

| Lifeform<br>Herb | Code  | Botanical Name                                 | Con | Avg  | Min  | Max  |
|------------------|-------|--|-----|------|------|------|
|                  | JUOC2 | <i>Juncus occidentalis</i>                     | 100 | 14.0 | 3.0  | 38.0 |
|                  | JUBU  | <i>Juncus bufonius</i>                         | 100 | 4.3  | 0.2  | 8.0  |
|                  | TRDU2 | <i>Trifolium dubium</i>                        | 100 | 1.0  | 0.2  | 3.0  |
|                  | BRMI2 | <i>Briza minor</i>                             | 100 | 0.6  | 0.2  | 3.0  |
|                  | LIBI5 | <i>Linum bienne</i>                            | 100 | 0.6  | 0.2  | 3.0  |
|                  | HOLA  | <i>Holcus lanatus</i>                          | 86  | 14.7 | 3.0  | 38.0 |
|                  | PLLA  | <i>Plantago lanceolata</i>                     | 86  | 8.0  | 3.0  | 18.0 |
|                  | CADE8 | <i>Carex densa</i>                             | 86  | 7.1  | 0.2  | 18.0 |
|                  | VUBR  | <i>Vulpia bromoides</i>                        | 86  | 5.2  | 1.0  | 8.0  |
|                  | LOPE  | <i>Lolium perenne</i>                          | 86  | 4.7  | 0.2  | 18.0 |
|                  | LOAN2 | <i>Lotus angustissimus</i>                     | 86  | 4.6  | 0.2  | 8.0  |
|                  | TRSU3 | <i>Trifolium subterraneum</i>                  | 86  | 2.9  | 0.2  | 8.0  |
|                  | GEDI  | <i>Geranium dissectum</i>                      | 86  | 0.7  | 0.1  | 3.0  |
|                  | DACA3 | <i>Danthonia californica</i>                   | 71  | 11.9 | 0.2  | 38.2 |
|                  | RACA2 | <i>Ranunculus californicus</i>                 | 71  | 5.9  | 0.2  | 18.0 |
|                  | CYEC  | <i>Cynosurus echinatus</i>                     | 71  | 4.3  | 0.2  | 18.0 |
|                  | SIBE  | <i>Sisyrinchium bellum</i>                     | 71  | 2.3  | 0.2  | 8.0  |
|                  | JUPA2 | <i>Juncus patens</i>                           | 57  | 13.0 | 3.0  | 38.0 |
|                  | HYRA3 | <i>Hypochaeris radicata</i>                    | 57  | 10.5 | 3.0  | 18.0 |
|                  | HOMAG | <i>Hordeum marinum</i> ssp. <i>gussonianum</i> | 57  | 10.1 | 0.2  | 38.0 |
|                  | VISA  | <i>Vicia sativa</i>                            | 57  | 0.3  | 0.2  | 0.4  |
|                  | LYHY3 | <i>Lythrum hyssopifolium</i>                   | 57  | 0.2  | 0.2  | 0.2  |
|                  | ISCA6 | <i>Isolepis carinata</i>                       | 57  | 0.2  | 0.2  | 0.2  |
|                  | ANAR  | <i>Anagallis arvensis</i>                      | 57  | 0.2  | 0.2  | 0.2  |
|                  | AICA  | <i>Aira caryophylla</i>                        | 57  | 0.2  | 0.2  | 0.2  |
|                  | CAGY3 | <i>Carex gynodynamis</i>                       | 43  | 13.0 | 3.0  | 18.0 |
|                  | LETA  | <i>Leontodon taraxacoides</i>                  | 43  | 9.7  | 3.0  | 18.0 |
|                  | BRHO2 | <i>Bromus hordeaceus</i>                       | 43  | 8.5  | 0.2  | 25.0 |
|                  | JUPH  | <i>Juncus phaeocephalus</i>                    | 43  | 1.1  | 0.2  | 3.0  |
|                  | RUPU3 | <i>Rumex pulcher</i>                           | 43  | 0.2  | 0.2  | 0.2  |
|                  | JUNCU | <i>Juncus</i>                                  | 29  | 18.0 | 18.0 | 18.0 |
|                  | MEPU  | <i>Mentha pulegium</i>                         | 29  | 9.1  | 0.2  | 18.0 |
|                  | IRDO  | <i>Iris douglasiana</i>                        | 29  | 3.0  | 3.0  | 3.0  |
|                  | JUCA5 | <i>Juncus capitatus</i>                        | 29  | 1.6  | 0.2  | 3.0  |
|                  | RUAC3 | <i>Rumex acetosella</i>                        | 29  | 1.6  | 0.2  | 3.0  |
|                  | SIGA  | <i>Silene gallica</i>                          | 29  | 0.2  | 0.2  | 0.2  |
|                  | MYDI  | <i>Myosotis discolor</i>                       | 29  | 0.2  | 0.2  | 0.2  |
|                  | TRHY3 | <i>Triteleia hyacinthina</i>                   | 29  | 0.2  | 0.2  | 0.2  |
|                  | GAPU3 | <i>Gamochaeta purpurea</i>                     | 29  | 0.2  | 0.2  | 0.2  |
|                  | RORO  | <i>Romulea rosea</i>                           | 29  | 0.2  | 0.1  | 0.2  |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

## ***Juncus patens* Provisional Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Franciscan/263Ag (2) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 55.3                | 43–68                | –                 |
| <b>Herb</b>                          | 55.7                | 42–68                | <0.5–1            |
| <b>Shrub</b>                         | 0.4                 | 0–1                  | <0.5–1            |
| <b>Regenerating/understory tree*</b> | 0.1                 | 0–0.2                | <0.5–0.5          |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** NW (1), SW (2)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (2)

**Microtopography:** flat (2), undulating (1)

**Parent material:** Franciscan melange (1), sandstone (1), sedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 977 ft.     | 299–2036 ft. |
| <b>Slope</b>             | 6.3°        | 1–15°        |
| <b>Large rock cover</b>  | 1.0%        | 0–3%         |
| <b>Small rock cover</b>  | 0.4%        | 0–1%         |
| <b>Bare ground cover</b> | 29.0%       | 4–77%        |
| <b>Litter cover</b>      | 65.7%       | 18–90%       |

### **Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** SONO0248, SONO0547, SONO0757

**SCV Global/State Rank:** G3?/S3?¹

### **STAND TABLE**

#### ***Juncus patens* Provisional Association**

n = 3

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>             | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|-----------------------------------|------------|------------|------------|------------|
| <b>Regenerating or Understory Tree</b> |             |                                   |            |            |            |            |
|  | QULO        | <i>Quercus lobata</i>             | 33         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>                           |             |                                   |            |            |            |            |
|  | TODI        | <i>Toxicodendron diversilobum</i> | 33         | 1.0        | 1.0        | 1.0        |
|  | RUUR        | <i>Rubus ursinus</i>              | 33         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |                                   |            |            |            |            |
|  | JUPA2       | <i>Juncus patens</i>              | 100        | 46.0       | 32.0       | 53.0       |
|  | LOPE        | <i>Lolium perenne</i>             | 67         | 3.1        | 0.2        | 6.0        |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Juncus patens* Provisional Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                             | 67         | 3.0        | 2.0        | 4.0        |
|                 | ELGL        | <i>Elymus glaucus</i>                                | 67         | 0.6        | 0.2        | 1.0        |
|                 | GAAP2       | <i>Galium aparine</i>                                | 67         | 0.2        | 0.2        | 0.2        |
|                 | CAPR5       | <i>Carex praegracilis</i>                            | 33         | 5.0        | 5.0        | 5.0        |
|                 | EQTEB       | <i>Equisetum telmateia</i> var. <i>braunii</i>       | 33         | 2.0        | 2.0        | 2.0        |
|                 | AVBA        | <i>Avena barbata</i>                                 | 33         | 2.0        | 2.0        | 2.0        |
|                 | RUAC3       | <i>Rumex acetosella</i>                              | 33         | 1.0        | 1.0        | 1.0        |
|                 | GECA5       | <i>Geranium carolinianum</i>                         | 33         | 1.0        | 1.0        | 1.0        |
|                 | AICA        | <i>Aira caryophyllea</i>                             | 33         | 1.0        | 1.0        | 1.0        |
|                 | BRDI3       | <i>Bromus diandrus</i>                               | 33         | 1.0        | 1.0        | 1.0        |
|                 | MEPO3       | <i>Medicago polymorpha</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                 | LETR5       | <i>Leymus triticoides</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | SOOL        | <i>Sonchus oleraceus</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                 | GAPA5       | <i>Galium parisiense</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                 | GEDI        | <i>Geranium dissectum</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | HOLA        | <i>Holcus lanatus</i>                                | 33         | 0.2        | 0.2        | 0.2        |
|                 | HOMAG       | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>       | 33         | 0.2        | 0.2        | 0.2        |
|                 | ERC16       | <i>Erodium cicutarium</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | LASA        | <i>Lactuca saligna</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 33         | 0.2        | 0.2        | 0.2        |
|                 | LOGA2       | <i>Logfia gallica</i>                                | 33         | 0.2        | 0.2        | 0.2        |
|                 | MADIA       | <i>Madia</i>   | 33         | 0.2        | 0.2        | 0.2        |
|                 | MEPU        | <i>Mentha pulegium</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | PSLU6       | <i>Pseudognaphalium luteoalbum</i>                   | 33         | 0.2        | 0.2        | 0.2        |
|                 | RUMEX       | <i>Rumex</i>   | 33         | 0.2        | 0.2        | 0.2        |
|                 | PEKE        | <i>Perideridia kelloggii</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                 | HOMU        | <i>Hordeum murinum</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | CAOL        | <i>Cardamine oligosperma</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                 | AGGR        | <i>Agoseris grandiflora</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                 | AGHE2       | <i>Agoseris heterophylla</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                 | ANAGA       | <i>Anagallis</i>                                     | 33         | 0.2        | 0.2        | 0.2        |
|                 | ANAR        | <i>Anagallis arvensis</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRDI2       | <i>Brachypodium distachyon</i>                       | 33         | 0.2        | 0.2        | 0.2        |
|                 | GAMU4       | <i>Galium murale</i>                                 | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>                                   | 33         | 0.2        | 0.2        | 0.2        |
|                 | SYCH4       | <i>Symphyotrichum chilense</i>                       | 33         | 0.2        | 0.2        | 0.2        |
|                 | CAREX       | <i>Carex</i>   | 33         | 0.2        | 0.2        | 0.2        |
|                 | CADE8       | <i>Carex densa</i>                                   | 33         | 0.2        | 0.2        | 0.2        |
|                 | CEGL2       | <i>Cerastium glomeratum</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | CYEC        | <i>Cynosurus echinatus</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRMA        | <i>Briza maxima</i>                                  | 33         | 0.2        | 0.2        | 0.2        |
|                 | TOAR        | <i>Torilis arvensis</i>                              | 33         | 0.2        | 0.2        | 0.2        |
|                 | VICIA       | <i>Vicia</i>   | 33         | 0.2        | 0.2        | 0.2        |
|                 | VIBE        | <i>Vicia benghalensis</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | VUBR        | <i>Vulpia bromoides</i>                              | 33         | 0.2        | 0.2        | 0.2        |

**STAND TABLE** continued

***Juncus patens* Provisional Association**

n = 3

| Lifeform     | Code   | Botanical Name       | Con | Avg | Min | Max |
|--------------|--------|----------------------|-----|-----|-----|-----|
| Herb         |        |                      |     |     |     |     |
|              | SOAS   | <i>Sonchus asper</i> | 33  | 0.2 | 0.2 | 0.2 |
| Non-vascular |        |                      |     |     |     |     |
|              | 2MOSS  | Moss                 | 33  | 1.0 | 1.0 | 1.0 |
|              | 2LICHN | Lichen               | 33  | 0.2 | 0.2 | 0.2 |

***Juncus phaeocephalus* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1), Coastal Hills-Santa Rosa Plain/263Aj (4), and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 60.6         | 14–95         | –          |
| Herb                          | 61.8         | 14–95         | <0.5–1     |
| Shrub                         | 0.3          | 0–2           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), NW (2), SE (2), variable (1)

**Macrotopography:** bottom (3), lower 1/3 of slope (1), middle 1/3 of slope (1), upper 1/3 of slope (3)

**Microtopography:** concave (3), flat (4), undulating (1)

**Parent material:** Franciscan melange (1), metasedimentary (2), sedimentary (2), silty alluvium (1), volcanic (2)

**Soil texture:** clay or clay loam (6), muck (1), sand (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (4), moderate/6-25° (2)

|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 700 ft. | 68–1310 ft. |
| Slope             | 4.4°    | 0–15°       |
| Large rock cover  | 0.0%    | 0–0%        |
| Small rock cover  | 0.0%    | 0–0%        |
| Bare ground cover | 9.4%    | 0–40%       |
| Litter cover      | 44.4%   | 0–93%       |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** none

**Relevés:** HEAD0187, HEAD0197, HEAD0374, HEAD0396, SONO0232, SONO0342, SONO0344, SONO0479

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

SCV Global/State Rank: G3?/S3?¹

**STAND TABLE**

***Juncus phaeocephalus* Provisional Association**

n = 8

| Lifeform | Code   | Botanical Name  | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Shrub    | RUUR   | <i>Rubus ursinus</i>                                    | 25  | 10.5 | 3.0  | 18.0 |
| Herb     | JUPH   | * <i>Juncus phaeocephalus</i>                           | 75  | 21.8 | 9.0  | 38.0 |
|          | CADE8  | <i>Carex densa</i>                                      | 63  | 7.9  | 0.2  | 18.0 |
|          | HOLA   | <i>Holcus lanatus</i>                                   | 50  | 11.1 | 0.2  | 38.0 |
|          | MEPU   | <i>Mentha pulegium</i>                                  | 50  | 9.7  | 0.2  | 38.0 |
|          | DACA3  | <i>Danthonia californica</i>                            | 50  | 5.4  | 0.2  | 18.0 |
|          | JUPA2  | <i>Juncus patens</i>                                    | 50  | 4.1  | 0.2  | 8.0  |
|          | LOPE   | <i>Lolium perenne</i>                                   | 50  | 2.9  | 0.2  | 8.2  |
|          | LETA   | <i>Leontodon taraxacoides</i>                           | 38  | 14.7 | 8.0  | 18.0 |
|          | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>             | 38  | 8.7  | 0.2  | 18.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                              | 38  | 8.0  | 3.0  | 18.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                                 | 38  | 6.1  | 0.2  | 18.0 |
|          | JUBU   | <i>Juncus bufonius</i>                                  | 38  | 3.7  | 0.2  | 8.0  |
|          | RACA2  | <i>Ranunculus californicus</i>                          | 38  | 2.8  | 0.2  | 8.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                           | 38  | 2.8  | 0.2  | 8.0  |
|          | LOAN2  | <i>Lotus angustissimus</i>                              | 38  | 2.1  | 0.2  | 3.0  |
|          | CAGY3  | <i>Carex gynodynamis</i>                                | 38  | 1.1  | 0.2  | 3.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                                 | 38  | 0.2  | 0.2  | 0.2  |
|          | LIBI5  | <i>Linum bienne</i>                                     | 38  | 0.2  | 0.2  | 0.2  |
|          | ISCE   | <i>Isolepis cernua</i>                                  | 38  | 0.2  | 0.2  | 0.2  |
|          | BRMI2  | <i>Briza minor</i>                                      | 38  | 0.2  | 0.2  | 0.2  |
|          | CYEC   | <i>Cynosurus echinatus</i>                              | 38  | 0.2  | 0.2  | 0.2  |
|          | JUPHP2 | * <i>Juncus phaeocephalus</i> var. <i>phaeocephalus</i> | 25  | 16.0 | 14.0 | 18.0 |
|          | JUOC2  | <i>Juncus occidentalis</i>                              | 25  | 9.1  | 0.1  | 18.0 |
|          | TRWO   | <i>Trifolium wormskioldii</i>                           | 25  | 5.5  | 3.0  | 8.0  |
|          | ERAR11 | <i>Eryngium aristulatum</i>                             | 25  | 2.5  | 1.0  | 4.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>          | 25  | 1.6  | 0.2  | 3.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                             | 25  | 1.6  | 0.2  | 3.0  |
|          | RUCR   | <i>Rumex crispus</i>                                    | 25  | 0.6  | 0.2  | 1.0  |
|          | PODO2  | <i>Pogogyne douglasii</i>                               | 25  | 0.6  | 0.2  | 1.0  |
|          | GEDI   | <i>Geranium dissectum</i>                               | 25  | 0.2  | 0.2  | 0.2  |
|          | TRBA   | <i>Trifolium barbigerum</i>                             | 25  | 0.2  | 0.2  | 0.2  |
|          | PLSU2  | <i>Plantago subnuda</i>                                 | 25  | 0.2  | 0.2  | 0.2  |
|          | POPR   | <i>Poa pratensis</i>                                    | 25  | 0.2  | 0.2  | 0.2  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                              | 25  | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                               | 25  | 0.2  | 0.2  | 0.2  |
|          | CATU3  | <i>Carex tumulicola</i>                                 | 25  | 0.2  | 0.2  | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Juncus phaeocephalus* Provisional Association**

n = 8

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|----------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                  |            |            |            |            |
|                 | CIVU        | <i>Cirsium vulgare</i>           | 25         | 0.2        | 0.2        | 0.2        |
|                 | DEDA        | <i>Deschampsia danthonioides</i> | 25         | 0.2        | 0.2        | 0.2        |
|                 | LOFO2       | <i>Lotus formosissimus</i>       | 25         | 0.2        | 0.2        | 0.2        |
|                 | AICA        | <i>Aira caryophyllea</i>         | 25         | 0.2        | 0.2        | 0.2        |
|                 | ISCA6       | <i>Isolepis carinata</i>         | 25         | 0.2        | 0.2        | 0.2        |
|                 | GAPU3       | <i>Gamochaeta purpurea</i>       | 25         | 0.2        | 0.1        | 0.2        |
|                 | CEGL2       | <i>Cerastium glomeratum</i>      | 25         | 0.2        | 0.1        | 0.2        |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

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

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Juncus arcticus* var. *balticus* or *Juncus arcticus* var. *mexicanus* is dominant or co-dominant in the herbaceous layer with *Achillea millefolium*, *Argentina egedii*, *Bolboschoenus robustus*, *Bromus diandrus*, *Carex* spp., *Conium maculatum*, *Deschampsia cespitosa*, *Distichlis spicata*, *Eleocharis acicularis*, *Geum macrophyllum*, *Iris missouriensis*, *Juncus effusus*, *Juncus phaeocephalus*, *Lepidium latifolium*, *Leymus cinereus*, *Poa pratensis*, *Ranunculus alismifolius*, *Schoenoplectus pungens*, *Sporobolus airoides*, *Taraxacum officinale*, and *Trifolium longipes*. Emergent trees and shrubs may be present at low cover.

Botanists have treated the circumboreal *Juncus arcticus* (var. *balticus*, *mexicanus*) complex in a plethora of ways. The online Jepson Interchange (2015) uses *Juncus balticus* ssp. *ater* and *J. mexicanus* for these two varieties, while the PLANTS Database (USDA-NRCS 2015) uses the name *J. arcticus* ssp. *littoralis* for var. *balticus*, and *J. mexicanus* is given species rank. We follow the Flora of North America treatment (Brooks and Clements 2000) that recognizes *Juncus arcticus* with four varieties, of which two (*balticus* and *mexicanus*) occur in California.

Sonoma County

Compared to the *Juncus* (*effusus*, *patens*) Alliance, stands of *Juncus arcticus* (var. *balticus*, *mexicanus*) are generally found in locations that are more regularly moist during the growing season. However they may occur adjacent to stands of the *J. (effusus, patens)* Alliance. The three sampled stands are adjacent to seeps, ponds, or riparian bottomland.

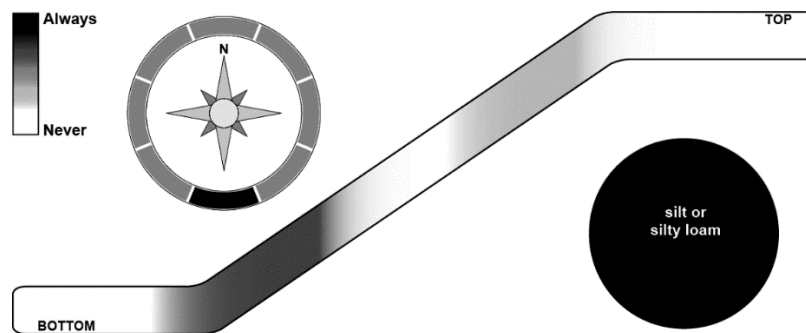
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**Local Alliance Summary (n = 3)**

**Elevation:** 647–2077 ft, mean 1447 ft

**SCV Global/State Rank:** G5/S4<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 43.3         | 10–80         | –          |
| <b>Herb</b>                          | 43.3         | 10–80         | <0.5–2     |
| <b>Shrub</b>                         | 0.1          | 0–0.2         | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 4.7°  | 0–8°   |
| <b>Large rock cover</b>  | 0.1%  | 0–0.2% |
| <b>Small rock cover</b>  | 0.1%  | 0–0.2% |
| <b>Bare ground cover</b> | 25.0% | 2–70%  |
| <b>Litter cover</b>      | 62.7% | 5–95%  |

**Associations within this Alliance:**

*Juncus arcticus* (var. *balticus*, *mexicanus*) Association

**STAND TABLE**

***Juncus arcticus* (var. *balticus*, *mexicanus*) Alliance**

n = 3

| Lifeform     | Code  | Botanical Name                  | Con | Avg  | Min  | Max  |
|--------------|-------|---------------------------------|-----|------|------|------|
| <b>Shrub</b> |       |                                 |     |      |      |      |
|              | RULE  | <i>Rubus leucodermis</i>        | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  |       |                                 |     |      |      |      |
|              | JUAR2 | <i>Juncus arcticus</i>          | 67  | 45.0 | 10.0 | 80.0 |
|              | MEPU  | <i>Mentha pulegium</i>          | 67  | 0.2  | 0.2  | 0.2  |
|              | JUNCU | <i>Juncus</i>                   | 33  | 25.0 | 25.0 | 25.0 |
|              | POPR  | <i>Poa pratensis</i>            | 33  | 8.0  | 8.0  | 8.0  |
|              | ELGL  | <i>Elymus glaucus</i>           | 33  | 1.0  | 1.0  | 1.0  |
|              | WOFI  | <i>Woodwardia fimbriata</i>     | 33  | 1.0  | 1.0  | 1.0  |
|              | ACMI2 | <i>Achillea millefolium</i>     | 33  | 0.2  | 0.2  | 0.2  |
|              | ARDO3 | <i>Artemisia douglasiana</i>    | 33  | 0.2  | 0.2  | 0.2  |
|              | BROMU | <i>Bromus</i>                   | 33  | 0.2  | 0.2  | 0.2  |
|              | CACI2 | <i>Calandrinia ciliata</i>      | 33  | 0.2  | 0.2  | 0.2  |
|              | CAOL  | <i>Cardamine oligosperma</i>    | 33  | 0.2  | 0.2  | 0.2  |
|              | CAREX | <i>Carex</i>                    | 33  | 0.2  | 0.2  | 0.2  |
|              | CESO3 | <i>Centaurea solstitialis</i>   | 33  | 0.2  | 0.2  | 0.2  |
|              | CHPO3 | <i>Chlorogalum pomeridianum</i> | 33  | 0.2  | 0.2  | 0.2  |
|              | CIRSI | <i>Cirsium</i>                  | 33  | 0.2  | 0.2  | 0.2  |
|              | DACA3 | <i>Danthonia californica</i>    | 33  | 0.2  | 0.2  | 0.2  |
|              | EPILO | <i>Epilobium</i>                | 33  | 0.2  | 0.2  | 0.2  |
|              | ERCI6 | <i>Erodium cicutarium</i>       | 33  | 0.2  | 0.2  | 0.2  |
|              | ESCA2 | <i>Eschscholzia californica</i> | 33  | 0.2  | 0.2  | 0.2  |
|              | GALIU | <i>Galium</i>                   | 33  | 0.2  | 0.2  | 0.2  |
|              | GEDI  | <i>Geranium dissectum</i>       | 33  | 0.2  | 0.2  | 0.2  |
|              | HEPU2 | <i>Helenium puberulum</i>       | 33  | 0.2  | 0.2  | 0.2  |
|              | LASE  | <i>Lactuca serriola</i>         | 33  | 0.2  | 0.2  | 0.2  |

**STAND TABLE** continued

***Juncus arcticus* (var. *balticus*, *mexicanus*) Alliance**

n = 3

| Lifeform | Code   | Botanical Name                                      | Con | Avg | Min | Max |
|----------|--------|---|-----|-----|-----|-----|
| Herb     | LATHY  | <i>Lathyrus</i>                                     | 33  | 0.2 | 0.2 | 0.2 |
|          | LOTUS  | <i>Lotus</i>  | 33  | 0.2 | 0.2 | 0.2 |
|          | MYDI   | <i>Myosotis discolor</i>                            | 33  | 0.2 | 0.2 | 0.2 |
|          | POGLG4 | <i>Potentilla glandulosa</i> ssp. <i>glandulosa</i> | 33  | 0.2 | 0.2 | 0.2 |
|          | RUAC3  | <i>Rumex acetosella</i>                             | 33  | 0.2 | 0.2 | 0.2 |
|          | SOAM   | <i>Solanum americanum</i>                           | 33  | 0.2 | 0.2 | 0.2 |
|          | TACA8  | <i>Taeniatherum caput-medusae</i>                   | 33  | 0.2 | 0.2 | 0.2 |
|          | URDI   | <i>Urtica dioica</i>                                | 33  | 0.2 | 0.2 | 0.2 |
|          | VETH   | <i>Verbascum thapsus</i>                            | 33  | 0.2 | 0.2 | 0.2 |
|          | VICIA  | <i>Vicia</i>  | 33  | 0.2 | 0.2 | 0.2 |
|          | VISA   | <i>Vicia sativa</i>                                 | 33  | 0.2 | 0.2 | 0.2 |

***Juncus arcticus* (var. *balticus*, *mexicanus*) Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Franciscan/263Ag (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 45.0         | 10–80         | –          |
| Herb                          | 45.0         | 10–80         | 0.5–2      |
| Shrub                         | 0.1          | 0–0.2         | 1–2        |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), variable (1)

**Macrotopography:** lower 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** concave (1), flat (1)

**Parent material:** Franciscan melange (1), greenstone (1)

**Soil texture:** silt or silt loam (1)

**Slope steepness:** moderate/6–25° (2)

|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1132 ft. | 647–1616 ft. |
| Slope             | 7.0°     | 6–8°         |
| Large rock cover  | 0.1%     | 0–0.2%       |
| Small rock cover  | 0.1%     | 0–0.2%       |
| Bare ground cover | 36.0%    | 2–70%        |
| Litter cover      | 46.5%    | 5–88%        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0067

**Relevés:** SONO0534

**SCV Global/State Rank:** G4?/S4?<sup>1</sup>

**STAND TABLE**

***Juncus arcticus* (var. *balticus*, *mexicanus*) Association**

n = 2

| Lifeform | Code  | Botanical Name              | Con | Avg  | Min  | Max  |
|----------|-------|-----------------------------|-----|------|------|------|
| Shrub    | RULE  | <i>Rubus leucodermis</i>    | 50  | 0.2  | 0.2  | 0.2  |
|          | JUAR2 | <i>Juncus arcticus</i>      | 100 | 45.0 | 10.0 | 80.0 |
| Herb     | WOFI  | <i>Woodwardia fimbriata</i> | 50  | 1.0  | 1.0  | 1.0  |
|          | EPILO | <i>Epilobium</i>            | 50  | 0.2  | 0.2  | 0.2  |
|          | URDI  | <i>Urtica dioica</i>        | 50  | 0.2  | 0.2  | 0.2  |
|          | SOAM  | <i>Solanum americanum</i>   | 50  | 0.2  | 0.2  | 0.2  |
|          | MEPU  | <i>Mentha pulegium</i>      | 50  | 0.2  | 0.2  | 0.2  |
|          | CIRSI | <i>Cirsium</i>              | 50  | 0.2  | 0.2  | 0.2  |
|          | HEPU2 | <i>Helenium puberulum</i>   | 50  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



***Juncus lescurii* Alliance**  
**Salt rush swales**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Juncus breweri* or *Juncus lescurii* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Eleocharis macrostachya*, and *Holcus lanatus*. Emergent shrubs may be present at low cover.

In California, this alliance occurs along coastal dunes and beaches where fresh water emerges near the sea. Sample data comes from the Humboldt Bay National Refuge (Pickart 2006), and this Sonoma County project. The references to *Juncus lescurii* on seasonally fluctuating or drier wetland sites, such as dune swales, in the San Francisco Bay area (Pickart and Barbour 2007) and from Morro Bay to Point Arena (Casavecchia and Biondi 2001, Stevens 2000b) are probably for populations of *J. breweri* (A. Pickart, per. comm. 2008).

Sonoma County

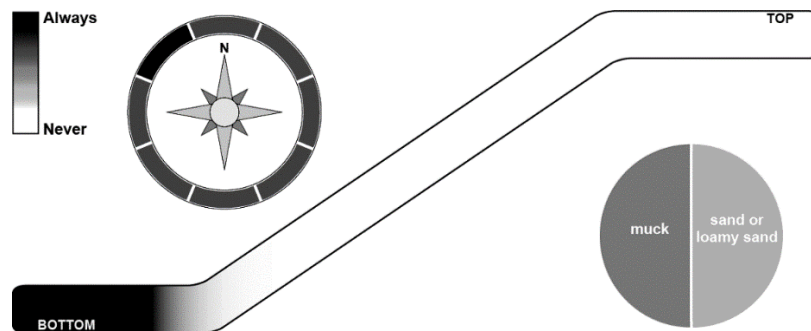
In Sonoma County, *Juncus lescurii* Alliance stands are restricted to sandy and/or moist areas within 1 km of the coast. Stands may creep onto the inland sides of active dunes or occur adjacent to creeks flowing through sandy areas into the ocean (as at Salmon Creek). A single stand was sampled near the Russian River, adjacent to *Carex obnupta* and *Scirpus microcarpus* Alliance stands, which had a low herbaceous layer of *Argentina egedii* beneath the *Juncus*. All *Juncus lescurii* stands in the county are small (< 0.5 ha).

**Local Alliance Summary (n = 3)**

**Elevation:** 0–24 ft, mean 15 ft

**SCV Global/State Rank:** G3/S2?<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 58.7         | 9–92          | –          |
| <b>Herb</b>             | 58.7         | 9–92          | <0.5–2     |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 0.3°  | 0–1°   |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.0%  | 0–0%   |
| Bare ground cover | 13.3% | 5–29%  |
| Litter cover      | 72.3% | 62–85% |

**Associations within this Alliance:**

*Juncus lescurii* Association

**STAND TABLE**

***Juncus lescurii* Alliance**

n = 3

| Lifeform | Code   | Botanical Name                                 | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | JULE   | <i>Juncus lesueurii</i>                        | 100 | 35.7 | 7.0 | 60.0 |
|          | AREG   | <i>Argentina egedii</i>                        | 100 | 10.0 | 1.0 | 26.0 |
|          | ELMA5  | <i>Eleocharis macrostachya</i>                 | 67  | 4.0  | 3.0 | 5.0  |
|          | OESA   | <i>Oenanthe sarmentosa</i>                     | 67  | 0.6  | 0.2 | 1.0  |
|          | RUMEX  | <i>Rumex</i>                                   | 67  | 0.2  | 0.2 | 0.2  |
|          | TYPHA  | <i>Typha</i>                                   | 33  | 7.0  | 7.0 | 7.0  |
|          | AGCA5  | <i>Agrostis capillaris</i>                     | 33  | 5.0  | 5.0 | 5.0  |
|          | CAOB3  | <i>Carex obnupta</i>                           | 33  | 5.0  | 5.0 | 5.0  |
|          | COMA2  | <i>Conium maculatum</i>                        | 33  | 5.0  | 5.0 | 5.0  |
|          | HOLA   | <i>Holcus lanatus</i>                          | 33  | 5.0  | 5.0 | 5.0  |
|          | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>    | 33  | 3.0  | 3.0 | 3.0  |
|          | JACA4  | <i>Jaumea carnosa</i>                          | 33  | 2.0  | 2.0 | 2.0  |
|          | JUPA2  | <i>Juncus patens</i>                           | 33  | 2.0  | 2.0 | 2.0  |
|          | APGR2  | <i>Apium graveolens</i>                        | 33  | 0.2  | 0.2 | 0.2  |
|          | DISP   | <i>Distichlis spicata</i>                      | 33  | 0.2  | 0.2 | 0.2  |
|          | GAAP2  | <i>Galium aparine</i>                          | 33  | 0.2  | 0.2 | 0.2  |
|          | GATRC  | <i>Galium trifidum</i> ssp. <i>columbianum</i> | 33  | 0.2  | 0.2 | 0.2  |
|          | LOTUS  | <i>Lotus</i>                                   | 33  | 0.2  | 0.2 | 0.2  |
|          | POLYG4 | <i>Polygonum</i>                               | 33  | 0.2  | 0.2 | 0.2  |
|          | RUCR   | <i>Rumex crispus</i>                           | 33  | 0.2  | 0.2 | 0.2  |

***Juncus lescurii* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsection (Miles and Goudey 1997).

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 58.7         | 9–92          | –          |
| Herb                          | 58.7         | 9–92          | <0.5–2     |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), NW (1)

**Macrotopography:** bottom (3)

**Microtopography:** flat (3)

**Parent material:** mixed alluvium (1), sand dunes (1), sedimentary (1)

**Soil texture:** muck (1), sand (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (1)

|                   | Mean   | Range    |
|-------------------|--------|----------|
| Elevation         | 15 ft. | 0–24 ft. |
| Slope             | 0.3°   | 0–1°     |
| Large rock cover  | 0.0%   | 0–0%     |
| Small rock cover  | 0.0%   | 0–0%     |
| Bare ground cover | 13.3%  | 5–29%    |
| Litter cover      | 72.3%  | 62–85%   |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0227

**Relevés:** SONO0023, SONO0447

**SCV Global/State Rank:** G3?/S2?<sup>1</sup>

**STAND TABLE**

***Juncus lescurii* Association**

n = 3

| Lifeform | Code  | Botanical Name                              | Con | Avg  | Min | Max  |
|----------|-------|---|-----|------|-----|------|
| Herb     |       |   |     |      |     |      |
|          | JULE  | <i>Juncus lesueurii</i>                     | 100 | 35.7 | 7.0 | 60.0 |
|          | AREG  | <i>Argentina egedii</i>                     | 100 | 10.0 | 1.0 | 26.0 |
|          | ELMA5 | <i>Eleocharis macrostachya</i>              | 67  | 4.0  | 3.0 | 5.0  |
|          | OESA  | <i>Oenanthe sarmentosa</i>                  | 67  | 0.6  | 0.2 | 1.0  |
|          | RUMEX | <i>Rumex</i>                                | 67  | 0.2  | 0.2 | 0.2  |
|          | TYPHA | <i>Typha</i>                                | 33  | 7.0  | 7.0 | 7.0  |
|          | CAOB3 | <i>Carex obnupta</i>                        | 33  | 5.0  | 5.0 | 5.0  |
|          | HOLA  | <i>Holcus lanatus</i>                       | 33  | 5.0  | 5.0 | 5.0  |
|          | COMA2 | <i>Conium maculatum</i>                     | 33  | 5.0  | 5.0 | 5.0  |
|          | AGCA5 | <i>Agrostis capillaris</i>                  | 33  | 5.0  | 5.0 | 5.0  |
|          | JUEFP | <i>Juncus effusus</i> var. <i>pacificus</i> | 33  | 3.0  | 3.0 | 3.0  |
|          | JUPA2 | <i>Juncus patens</i>                        | 33  | 2.0  | 2.0 | 2.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

*Juncus lescurii* Association

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     | JACA4       | <i>Jaumea carnosa</i>                          | 33         | 2.0        | 2.0        | 2.0        |
|                 | APGR2       | <i>Apium graveolens</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|                 | RUCR        | <i>Rumex crispus</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                 | POLYG4      | <i>Polygonum</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | LOTUS       | <i>Lotus</i>                                   | 33         | 0.2        | 0.2        | 0.2        |
|                 | GATRC       | <i>Galium trifidum</i> ssp. <i>columbianum</i> | 33         | 0.2        | 0.2        | 0.2        |
|                 | GAAP2       | <i>Galium aparine</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                 | DISP        | <i>Distichlis spicata</i>                      | 33         | 0.2        | 0.2        | 0.2        |

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***Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance**  
**California goldfields – dwarf plantain – small fescue flower fields**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Lasthenia californica*, *Plantago erecta*, and/or *Vulpia microstachys* are dominant individually or co-dominant in the herbaceous layer with *Achillea millefolium*, *Achnatherum lemmonii*, *Agrostis elliotiana*, *Avena barbata*, *Bromus hordeaceus*, *Calycadenia multiglandulosa*, *Calycadenia truncata*, *Castilleja exserta*, *Chlorogalum pomeridianum*, *Cryptantha flaccida*, *Eriogonum nudum*, *Eschscholzia californica*, *Hemizonia congesta*, *Hesperovax sparsiflora*, *Lasthenia* spp., *Lepidium nitidum*, *Lessingia* spp., *Lolium perenne*, *Lomatium utriculatum*, *Lotus wrangelianus*, *Lupinus nanus*, *Lupinus spectabilis*, *Microseris douglasii*, *Mimulus guttatus*, *Minuartia douglasii*, *Muilla maritima*, *Nassella pulchra*, *Navarretia tagetina*, *Pentagramma triangularis*, *Platystemon californicus*, *Sanicula bipinnatifida*, *Sedella pumila*, *Selaginella hansenii*, *Sidalcea diploscypha*, *Sisyrinchium bellum*, and *Trifolium* spp.

Stands of the *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance occur throughout much of cismontane California (Bartolome et al. 2007a, Evens and San 2004, Hobbs and Mooney 1991, Klein et al. 2007, McCarten 1991, Rodriguez-Rojo et al. 2001a, 2001b, Weiss 1999). This alliance represents a triad of native species that have a broad adaptation to the area's Mediterranean climate. Bartolome et al. (2007a) suggested that native annual grassland types replace steppe types wherever annual rainfall is less than 21 cm. *Vulpia microstachys* var. *pauciflora* is the most frequent annual grass of these semi-desert grasslands.

This alliance appears to be seasonally abundant on infertile soils of less frequent disturbance, whereas other herbaceous stands with more disturbance-related taxa appear more regularly on deeper and disturbed soils (cf. Hobbs and Mooney 1991, Seabloom et al. 2003, Howard 2006). Adaptation to local site/soil conditions allows these native species to dominate on serpentine soils (Espeland and Rice 2007, Howard 2006, Rajakaruna and Bohm 1999). The three species commonly co-occur, though in some areas only one or two may predominate.

Sonoma County

*Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* is a diverse alliance in the county. It is represented by at least 5 different associations, ranging from the most mesic coastal expression (where *Erigeron glaucus* co-dominates with *Lasthenia californica*), to dry inland serpentine soils stands (where species of *Calycadenia* associated with the dominant herbs). All stands are characterized by a low-growing herbaceous layer without high cover of non-native herbs and grasses, commonly a result of shallow or infertile soils.

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**Local Alliance Summary (n = 38)**

**Elevation:** 45–1901 ft, mean 590 ft

**SCV Global/State Rank:** G4/S4<sup>2</sup>

**Noteworthy Taxa**

*Gilia capitata* ssp. *tomentosa*

CA rare plant rank: 1B.1

NatureServe global/state rank: G5T2/S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Noteworthy Taxa, continued**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

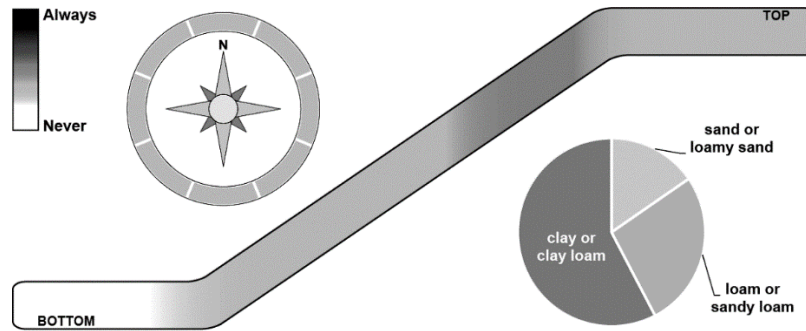
NatureServe global/state rank: G5T1T2/S1S2

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe global/state rank: G4T3/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 52.4         | 16–90         | –          |
| <b>Herb</b>                          | 53.3         | 16–90         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.3          | 0–10          | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 12.3° | 0–45° |
| <b>Large rock cover</b>  | 7.1%  | 0–35% |
| <b>Small rock cover</b>  | 14.5% | 0–67% |
| <b>Bare ground cover</b> | 25.1% | 0–97% |
| <b>Litter cover</b>      | 31.9% | 0–90% |

**Associations within this Alliance:**

*Erigeron glaucus* – *Lasthenia californica* Provisional Association

*Hemizonia congesta* – *Lolium perenne* Provisional Association

*Lotus humistratus* – *Plantago erecta* – *Lomatium* spp. Provisional Association

*Micropus californicus* Provisional Association

*Vulpia microstachys* – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)* Association

**STAND TABLE**

***Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance**

n = 38

| Lifeform | Code  | Botanical Name           | Con | Avg | Min | Max  |
|----------|-------|--------------------------|-----|-----|-----|------|
| Herb     | BRHO2 | <i>Bromus hordeaceus</i> | 66  | 3.5 | 0.2 | 15.0 |

**STAND TABLE** continued

***Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance**

n = 38

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | PLER3  | <i>Plantago erecta</i>                               | 63  | 3.1  | 0.2 | 18.0 |
|          | LOPE   | <i>Lolium perenne</i>                                | 61  | 13.3 | 0.2 | 68.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 50  | 2.3  | 0.2 | 8.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 50  | 0.7  | 0.2 | 8.0  |
|          | LACA7  | <i>Lasthenia californica</i>                         | 47  | 18.8 | 0.2 | 68.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                              | 45  | 4.9  | 0.2 | 20.0 |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 45  | 0.8  | 0.1 | 3.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                            | 45  | 0.5  | 0.2 | 3.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                           | 42  | 1.7  | 0.2 | 8.0  |
|          | DAPU3  | <i>Daucus pusillus</i>                               | 42  | 0.4  | 0.2 | 3.0  |
|          | AICA   | <i>Aira caryophylla</i>                              | 37  | 1.1  | 0.2 | 8.0  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 37  | 0.6  | 0.1 | 3.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                          | 34  | 4.9  | 0.2 | 38.0 |
|          | TRMI5  | <i>Trifolium microdon</i>                            | 34  | 1.1  | 0.2 | 3.0  |
|          | HOB2   | <i>Hordeum brachyantherum</i>                        | 32  | 4.0  | 0.2 | 8.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                            | 32  | 3.0  | 0.2 | 18.0 |
|          | SIGA   | <i>Silene gallica</i>                                | 32  | 0.3  | 0.1 | 1.0  |
|          | LOHU2  | <i>Lotus humistratus</i>                             | 29  | 2.8  | 0.2 | 8.0  |
|          | LOWR2  | <i>Lotus wrangelianus</i>                            | 29  | 1.8  | 0.2 | 18.0 |
|          | ACMI2  | <i>Achillea millefolium</i>                          | 29  | 1.0  | 0.2 | 3.0  |
|          | BRCA5  | <i>Bromus carinatus</i>                              | 26  | 3.6  | 0.2 | 18.0 |
|          | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i>       | 24  | 36.0 | 0.2 | 68.0 |
|          | CYEC   | <i>Cynosurus echinatus</i>                           | 24  | 5.6  | 0.2 | 38.0 |
|          | AVBA   | <i>Avena barbata</i>                                 | 24  | 4.8  | 0.2 | 18.0 |
|          | TRBA   | <i>Trifolium barbigerum</i>                          | 24  | 2.8  | 0.2 | 18.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                               | 24  | 1.0  | 0.1 | 3.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 24  | 0.4  | 0.2 | 2.0  |
|          | GEDI   | <i>Geranium dissectum</i>                            | 24  | 0.2  | 0.2 | 0.2  |
|          | TRMI4  | <i>Trifolium microcephalum</i>                       | 21  | 6.1  | 0.2 | 18.0 |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 21  | 3.1  | 0.2 | 8.0  |
|          | ELMU3  | <i>Elymus multisetus</i>                             | 21  | 3.1  | 0.2 | 8.0  |
|          | MIDO   | <i>Microseris douglasii</i>                          | 21  | 2.2  | 0.2 | 8.2  |
|          | SOSE2  | <i>Soliva sessilis</i>                               | 21  | 0.6  | 0.2 | 3.0  |
|          | RACA2  | <i>Ranunculus californicus</i>                       | 21  | 0.3  | 0.2 | 1.0  |
|          | TRAL5  | <i>Trifolium albopurpureum</i>                       | 21  | 0.3  | 0.2 | 1.0  |

**Noteworthy Taxa**

*Gilia capitata* ssp. *tomentosa*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G5T2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

*Hesperivax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

***Erigeron glaucus* – *Lasthenia californica* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (7) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 76.7         | 50–90         | –          |
| Herb                          | 77.9         | 50–90         | –          |
| Shrub                         | 1.4          | 0–10          | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (2), NW (4), SW (1)

**Macrotopography:** lower 1/3 of slope (3), upper 1/3 of slope (4)

**Microtopography:** convex (3), flat (2), undulating (2)

**Parent material:** granitic (1), igneous (1), metasedimentary (1), sandstone (1), sedimentary (2)

**Soil texture:** clay or clay loam (1), loam or sandy loam (4), sand (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (2), moderate/6-25° (3)

|                   | Mean   | Range     |
|-------------------|--------|-----------|
| Elevation         | 66 ft. | 45–87 ft. |
| Slope             | 7.3°   | 0–20°     |
| Large rock cover  | 2.0%   | 0–7%      |
| Small rock cover  | 4.2%   | 0–15%     |
| Bare ground cover | 21.7%  | 2–50%     |
| Litter cover      | 40.6%  | 5–60%     |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** none

**Relevés:** HEAD0014, HEAD0015, HEAD0057, HEAD0113, HEAD0208, HEAD0362, HEAD0364

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Erigeron glaucus* – *Lasthenia californica* Provisional Association**

n = 7

| Lifeform | Code  | Botanical Name                | Con | Avg  | Min | Max  |
|----------|-------|-------------------------------|-----|------|-----|------|
| Herb     |       |                               |     |      |     |      |
|          | LACA7 | <i>Lasthenia californica</i>  | 100 | 33.3 | 0.2 | 68.0 |
|          | ERGL3 | <i>Erigeron glaucus</i>       | 100 | 11.2 | 0.2 | 18.0 |
|          | HOBR2 | <i>Hordeum brachyantherum</i> | 100 | 4.7  | 0.2 | 8.0  |
|          | ANAR  | <i>Anagallis arvensis</i>     | 100 | 0.6  | 0.2 | 3.0  |
|          | BRCA5 | <i>Bromus carinatus</i>       | 86  | 4.6  | 0.2 | 18.0 |
|          | TRBA  | <i>Trifolium barbigerum</i>   | 86  | 4.1  | 0.2 | 18.0 |
|          | LUVE  | <i>Lupinus versicolor</i>     | 86  | 3.3  | 0.2 | 8.0  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Erigeron glaucus* – *Lasthenia californica* Provisional Association**

n = 7

| Lifeform<br>Herb | Code   | Botanical Name  | Con | Avg | Min | Max  |
|------------------|--------|---|-----|-----|-----|------|
|                  | CIQU2  | <i>Cirsium quercetorum</i>                              | 86  | 1.6 | 0.2 | 3.0  |
|                  | ARMAC2 | <i>Armeria maritima</i> ssp. <i>californica</i>         | 86  | 1.1 | 0.2 | 3.0  |
|                  | DAPU3  | <i>Daucus pusillus</i>                                  | 86  | 0.7 | 0.2 | 3.0  |
|                  | SOSE2  | <i>Soliva sessilis</i>                                  | 86  | 0.7 | 0.2 | 3.0  |
|                  | HYRA3  | <i>Hypochaeris radicata</i>                             | 71  | 9.9 | 0.2 | 38.0 |
|                  | VUBR   | <i>Vulpia bromoides</i>                                 | 71  | 5.4 | 0.2 | 8.0  |
|                  | POUN   | <i>Poa unilateralis</i>                                 | 71  | 3.3 | 0.2 | 8.0  |
|                  | GAAP2  | <i>Galium aparine</i>                                   | 71  | 0.2 | 0.2 | 0.2  |
|                  | RUAC3  | <i>Rumex acetosella</i>                                 | 57  | 2.9 | 0.2 | 8.0  |
|                  | ESCA2  | <i>Eschscholzia californica</i>                         | 57  | 0.9 | 0.1 | 3.0  |
|                  | SIMA2  | <i>Sidalcea malviflora</i>                              | 57  | 0.2 | 0.2 | 0.2  |
|                  | PLEL   | <i>Plantago elongata</i>                                | 57  | 0.2 | 0.2 | 0.2  |
|                  | POAN   | <i>Poa annua</i>  | 57  | 0.2 | 0.2 | 0.2  |
|                  | POTET2 | <i>Polycarpon tetraphyllum</i> ssp. <i>tetraphyllum</i> | 57  | 0.2 | 0.2 | 0.2  |
|                  | RACA2  | <i>Ranunculus californicus</i>                          | 57  | 0.2 | 0.2 | 0.2  |
|                  | AIPR   | <i>Aira praecox</i>                                     | 43  | 8.7 | 0.2 | 18.0 |
|                  | PLCO3  | <i>Plantago coronopus</i>                               | 43  | 2.8 | 0.2 | 8.0  |
|                  | PLER3  | <i>Plantago erecta</i>                                  | 43  | 2.8 | 0.2 | 8.0  |
|                  | ERST9  | <i>Eriophyllum stoechadifolium</i>                      | 43  | 2.8 | 0.2 | 8.0  |
|                  | PLLA   | <i>Plantago lanceolata</i>                              | 43  | 2.1 | 0.2 | 3.0  |
|                  | ACMI2  | <i>Achillea millefolium</i>                             | 43  | 1.1 | 0.2 | 3.0  |
|                  | PLCA5  | <i>Platystemon californicus</i>                         | 43  | 0.2 | 0.2 | 0.2  |
|                  | CAPU18 | <i>Calystegia purpurata</i>                             | 43  | 0.2 | 0.2 | 0.2  |
|                  | SAAR9  | <i>Sanicula arctopoides</i>                             | 43  | 0.2 | 0.2 | 0.2  |
|                  | SIGA   | <i>Silene gallica</i>                                   | 43  | 0.2 | 0.2 | 0.2  |
|                  | SAGIN  | <i>Sagina</i>   | 43  | 0.2 | 0.2 | 0.2  |
|                  | PLRE   | <i>Plagiobothrys reticulatus</i>                        | 43  | 0.2 | 0.2 | 0.2  |
|                  | MIBI   | <i>Microseris bigelovii</i>                             | 43  | 0.2 | 0.2 | 0.2  |
|                  | GNAPH  | <i>Gnaphalium</i>                                       | 43  | 0.2 | 0.2 | 0.2  |
|                  | CEGL2  | <i>Cerastium glomeratum</i>                             | 43  | 0.2 | 0.2 | 0.2  |
|                  | GEDI   | <i>Geranium dissectum</i>                               | 43  | 0.2 | 0.2 | 0.2  |
|                  | CAED3  | <i>Carpobrotus edulis</i>                               | 43  | 0.2 | 0.1 | 0.2  |
|                  | MASA   | <i>Madia sativa</i>                                     | 43  | 0.2 | 0.1 | 0.2  |
|                  | SPMA   | <i>Spergularia macrotheca</i>                           | 43  | 0.2 | 0.1 | 0.2  |
|                  | GRST3  | <i>Grindelia stricta</i>                                | 29  | 9.1 | 0.2 | 18.0 |
|                  | ERLA5  | <i>Eriogonum latifolium</i>                             | 29  | 4.1 | 0.2 | 8.0  |
|                  | GAPU3  | <i>Gamochaeta purpurea</i>                              | 29  | 1.6 | 0.2 | 3.0  |
|                  | HESP9  | * <i>Hesperivax sparsiflora</i>                         | 29  | 1.6 | 0.2 | 3.0  |
|                  | AICA   | <i>Aira caryophyllea</i>                                | 29  | 1.6 | 0.2 | 3.0  |
|                  | ERIOG  | <i>Eriogonum</i>  | 29  | 1.6 | 0.2 | 3.0  |
|                  | CLPE   | <i>Claytonia perfoliata</i>                             | 29  | 1.6 | 0.1 | 3.0  |
|                  | STAJ   | <i>Stachys ajugoides</i>                                | 29  | 0.2 | 0.2 | 0.2  |
|                  | DACA3  | <i>Danthonia californica</i>                            | 29  | 0.2 | 0.2 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Erigeron glaucus* – *Lasthenia californica* Provisional Association**

n = 7

| Lifeform | Code   | Botanical Name  | Con | Avg | Min | Max |
|----------|--------|---|-----|-----|-----|-----|
| Herb     | CRCO34 | <i>Crassula connata</i>                                 | 29  | 0.2 | 0.2 | 0.2 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                                | 29  | 0.2 | 0.2 | 0.2 |
|          | CASTI2 | <i>Castilleja</i>                                       | 29  | 0.2 | 0.2 | 0.2 |
|          | TRDI6  | <i>Trifolium dichotomum</i>                             | 29  | 0.2 | 0.2 | 0.2 |
|          | SOAS   | <i>Sonchus asper</i>                                    | 29  | 0.2 | 0.2 | 0.2 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                              | 29  | 0.2 | 0.2 | 0.2 |
|          | PSCA13 | <i>Pseudognaphalium californicum</i>                    | 29  | 0.2 | 0.2 | 0.2 |
|          | NEME   | <i>Nemophila menziesii</i>                              | 29  | 0.2 | 0.2 | 0.2 |
|          | DUFA   | <i>Dudleya farinosa</i>                                 | 29  | 0.2 | 0.2 | 0.2 |
|          | DUDLE  | <i>Dudleya</i>  | 29  | 0.2 | 0.2 | 0.2 |
|          | TRPU16 | <i>Triphysaria pusilla</i>                              | 29  | 0.2 | 0.2 | 0.2 |
|          | SOOL   | <i>Sonchus oleraceus</i>                                | 29  | 0.2 | 0.1 | 0.2 |
|          | HESPB  | * <i>Hesperervax sparsiflora</i> var. <i>brevifolia</i> | 29  | 0.2 | 0.1 | 0.2 |
|          | SACR2  | <i>Sanicula crassicaulis</i>                            | 29  | 0.2 | 0.1 | 0.2 |

**Noteworthy Taxa**

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Hemizonia congesta* – *Lolium perenne* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (5), and Coastal Hills-Santa Rosa Plain/263Aj (8) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 61.3         | 30–85         | –          |
| <b>Herb</b>                          | 61.5         | 30–85         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0–0.2         | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (7), NW (2), SE (3), SW (1)

**Macrotopography:** lower 1/3 of slope (2), lower to middle 1/3 of slope (1), middle 1/3 of slope (3), ridge top (1), upper 1/3 of slope (7)

**Microtopography:** concave (3), convex (6), flat (4), undulating (1)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data, continued**

**Parent material:** greenstone (1), metasedimentary (1), sedimentary (1), serpentine (5), ultramafic (3), volcanic (2)

**Soil texture:** clay or clay loam (10), sand (2)

**Slope steepness:** flat/0° (1), gentle/1-5° (1), moderate/6-25° (12)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 522 ft. | 230–1292 ft. |
| <b>Slope</b>             | 12.3°   | 0–20°        |
| <b>Large rock cover</b>  | 2.8%    | 0–12%        |
| <b>Small rock cover</b>  | 10.0%   | 0–28%        |
| <b>Bare ground cover</b> | 17.4%   | 2–73%        |
| <b>Litter cover</b>      | 39.7%   | 2–90%        |

**Samples Used to Describe Association (n=14)**

**Rapid Assessments:** SONO0749

**Relevés:** HEAD0089, HEAD0151, HEAD0163, HEAD0336, HEAD0337, HEAD0347, HEAD0359, HEAD0361, HEAD0366, HEAD0382, HEAD0388, HEAD0418, SONO0931

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Hemizonia congesta* – *Lolium perenne* Provisional Association**

n = 14

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     |        |  |     |      |      |      |
|          | LOPE   | <i>Lolium perenne</i>                            | 100 | 20.2 | 1.0  | 68.0 |
|          | TRMI5  | <i>Trifolium microdon</i>                        | 79  | 1.2  | 0.2  | 3.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                         | 71  | 3.9  | 0.2  | 10.0 |
|          | LOWR2  | <i>Lotus wrangelianus</i>                        | 71  | 2.0  | 0.2  | 18.0 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                       | 71  | 1.0  | 0.2  | 8.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                          | 64  | 3.6  | 0.2  | 20.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                          | 64  | 2.0  | 0.2  | 8.0  |
|          | HECOC2 | * <i>Hemizonia congesta</i> ssp. <i>congesta</i> | 57  | 40.5 | 18.0 | 68.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 57  | 0.6  | 0.2  | 3.0  |
|          | TRLA16 | <i>Triteleia laxa</i>                            | 50  | 1.8  | 0.2  | 3.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                        | 50  | 1.4  | 0.2  | 6.0  |
|          | AVBA   | <i>Avena barbata</i>                             | 43  | 3.7  | 0.2  | 8.0  |
|          | AICA   | <i>Aira caryophyllea</i>                         | 43  | 1.5  | 0.2  | 8.0  |
|          | PLER3  | <i>Plantago erecta</i>                           | 43  | 1.1  | 0.2  | 3.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                  | 43  | 0.7  | 0.2  | 3.0  |
|          | CYEC   | <i>Cynosurus echinatus</i>                       | 36  | 9.3  | 0.2  | 38.0 |
|          | TRMI4  | <i>Trifolium microcephalum</i>                   | 36  | 7.4  | 0.2  | 18.0 |
|          | MIDO   | <i>Microseris douglasii</i>                      | 36  | 2.9  | 0.2  | 8.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                      | 36  | 1.9  | 0.2  | 3.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                       | 36  | 1.8  | 0.2  | 8.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Hemizonia congesta* – *Lolium perenne* Provisional Association**

n = 14

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | MEPO3       | <i>Medicago polymorpha</i>                           | 36         | 1.3        | 0.2        | 3.0        |
|                 | TRBI        | <i>Trifolium bifidum</i>                             | 36         | 1.3        | 0.2        | 3.0        |
|                 | BRDI3       | <i>Bromus diandrus</i>                               | 36         | 0.8        | 0.2        | 3.0        |
|                 | DAPU3       | <i>Daucus pusillus</i>                               | 36         | 0.2        | 0.2        | 0.2        |
|                 | TRAL5       | <i>Trifolium albopurpureum</i>                       | 36         | 0.2        | 0.2        | 0.2        |
|                 | SIGA        | <i>Silene gallica</i>                                | 36         | 0.2        | 0.2        | 0.2        |
|                 | GEDI        | <i>Geranium dissectum</i>                            | 36         | 0.2        | 0.2        | 0.2        |
|                 | LASA        | <i>Lactuca saligna</i>                               | 36         | 0.2        | 0.2        | 0.2        |
|                 | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 36         | 0.2        | 0.1        | 0.2        |
|                 | HECOL3      | * <i>Hemizonia congesta</i> ssp. <i>luzulifolia</i>  | 29         | 20.5       | 8.0        | 38.0       |
|                 | LOUNU       | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> | 29         | 10.4       | 0.2        | 38.0       |
|                 | HOB2        | <i>Hordeum brachyantherum</i>                        | 29         | 3.6        | 0.2        | 8.0        |
|                 | ERBO        | <i>Erodium botrys</i>                                | 29         | 1.4        | 0.2        | 3.0        |
|                 | TRSU3       | <i>Trifolium subterraneum</i>                        | 29         | 1.1        | 0.2        | 3.0        |
|                 | JUBU        | <i>Juncus bufonius</i>                               | 29         | 0.9        | 0.2        | 3.0        |
|                 | TRDU2       | <i>Trifolium dubium</i>                              | 29         | 0.9        | 0.2        | 3.0        |
|                 | EUSP        | <i>Euphorbia spathulata</i>                          | 29         | 0.9        | 0.2        | 3.0        |
|                 | BRMI2       | <i>Briza minor</i>                                   | 29         | 0.9        | 0.2        | 3.0        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>                      | 29         | 0.2        | 0.2        | 0.2        |
|                 | LAPL        | <i>Layia platyglossa</i>                             | 29         | 0.2        | 0.2        | 0.2        |
|                 | SABI3       | <i>Sanicula bipinnatifida</i>                        | 29         | 0.2        | 0.2        | 0.2        |
|                 | TRCI        | <i>Trifolium ciliolatum</i>                          | 29         | 0.2        | 0.2        | 0.2        |
|                 | ACMI2       | <i>Achillea millefolium</i>                          | 29         | 0.2        | 0.2        | 0.2        |
|                 | BRMA        | <i>Briza maxima</i>                                  | 21         | 7.1        | 0.2        | 18.0       |
|                 | TRDI6       | <i>Trifolium dichotomum</i>                          | 21         | 3.7        | 0.2        | 8.0        |
|                 | SYMPH4      | <i>Symphyotrichum</i>                                | 21         | 2.8        | 0.2        | 8.0        |
|                 | BRTET       | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 21         | 1.1        | 0.2        | 3.0        |
|                 | PEKE        | <i>Perideridia kelloggii</i>                         | 21         | 0.2        | 0.2        | 0.2        |
|                 | GAPH2       | <i>Gastroidium phleoides</i>                         | 21         | 0.2        | 0.2        | 0.2        |
|                 | VISA        | <i>Vicia sativa</i>                                  | 21         | 0.2        | 0.2        | 0.2        |
|                 | SHAR2       | <i>Sherardia arvensis</i>                            | 21         | 0.2        | 0.2        | 0.2        |
|                 | GADI        | <i>Galium divaricatum</i>                            | 21         | 0.2        | 0.2        | 0.2        |
|                 | CLPUQ       | <i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>    | 21         | 0.2        | 0.2        | 0.2        |
|                 | CEMU2       | <i>Centaurium muehlenbergii</i>                      | 21         | 0.2        | 0.2        | 0.2        |
|                 | RACA2       | <i>Ranunculus californicus</i>                       | 21         | 0.2        | 0.2        | 0.2        |
|                 | LUNA3       | <i>Lupinus nanus</i>                                 | 21         | 0.2        | 0.1        | 0.2        |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Lotus humistratus* – *Plantago erecta* – *Lomatium* spp. Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 28.3         | 20–35         | –          |
| <b>Herb</b>                          | 28.0         | 19–35         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.3          | 0–1           | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), SE (1), SW (1)

**Macrotopography:** middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** convex (3)

**Parent material:** Franciscan melange (1), mixed sedimentary (1), serpentine (1)

**Soil texture:** loam or sandy loam (1)

**Slope steepness:** steep/>25° (3)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1003 ft. | 624–1225 ft. |
| <b>Slope</b>             | 38.0°    | 31–45°       |
| <b>Large rock cover</b>  | 27.7%    | 23–32%       |
| <b>Small rock cover</b>  | 32.5%    | 13–52%       |
| <b>Bare ground cover</b> | 12.0%    | 0–21%        |
| <b>Litter cover</b>      | 15.7%    | 5–32%        |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** HEAD0380, SONO0473, SONO0474

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Lotus humistratus* – *Plantago erecta* – *Lomatium* spp. Provisional Association**

n = 3

| Lifeform | Code   | Botanical Name                                       | Con | Avg | Min | Max |
|----------|--------|--|-----|-----|-----|-----|
| Shrub    | ARMA   | <i>Arctostaphylos manzanita</i>                      | 33  | 0.2 | 0.2 | 0.2 |
|          | LOHU2  | <i>Lotus humistratus</i>                             | 100 | 4.1 | 0.2 | 8.0 |
| Herb     | BRMA3  | <i>Bromus madritensis</i>                            | 100 | 3.7 | 3.0 | 5.0 |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 100 | 0.5 | 0.2 | 1.0 |
|          | PLER3  | <i>Plantago erecta</i>                               | 100 | 0.5 | 0.2 | 1.0 |
|          | LOGA2  | <i>Logfia gallica</i>                                | 100 | 0.2 | 0.2 | 0.2 |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Lotus humistratus* – *Plantago erecta* – *Lomatium* spp. Provisional Association**

n = 3

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | AVBA        | <i>Avena barbata</i>                             | 67         | 10.5       | 3.0        | 18.0       |
|                     | LODA        | <i>Lomatium dasycarpum</i>                       | 67         | 5.1        | 0.2        | 10.0       |
|                     | TRWI3       | <i>Trifolium willdenovii</i>                     | 67         | 4.1        | 0.2        | 8.0        |
|                     | GITR2       | <i>Gilia tricolor</i>                            | 67         | 2.1        | 0.2        | 4.0        |
|                     | BRDI3       | <i>Bromus diandrus</i>                           | 67         | 1.1        | 0.1        | 2.0        |
|                     | ESCA2       | <i>Eschscholzia californica</i>                  | 67         | 0.2        | 0.2        | 0.2        |
|                     | CRYPT       | <i>Cryptantha</i>                                | 67         | 0.2        | 0.2        | 0.2        |
|                     | BRHO2       | <i>Bromus hordeaceus</i>                         | 67         | 0.2        | 0.2        | 0.2        |
|                     | LUBI        | <i>Lupinus bicolor</i>                           | 67         | 0.2        | 0.2        | 0.2        |
|                     | BRMA        | <i>Briza maxima</i>                              | 67         | 0.2        | 0.1        | 0.2        |
|                     | TRMI4       | <i>Trifolium microcephalum</i>                   | 33         | 8.0        | 8.0        | 8.0        |
|                     | ERBO        | <i>Erodium botrys</i>                            | 33         | 4.0        | 4.0        | 4.0        |
|                     | HYGL2       | <i>Hypochaeris glabra</i>                        | 33         | 3.0        | 3.0        | 3.0        |
|                     | STGL8       | <i>Streptanthus glandulosus</i>                  | 33         | 3.0        | 3.0        | 3.0        |
|                     | HYRA3       | <i>Hypochaeris radicata</i>                      | 33         | 2.0        | 2.0        | 2.0        |
|                     | TRLA4       | <i>Trichostema lanceolatum</i>                   | 33         | 2.0        | 2.0        | 2.0        |
|                     | NAPU4       | <i>Nassella pulchra</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                     | LODIM       | <i>Lomatium dissectum</i> var. <i>multifidum</i> | 33         | 0.2        | 0.2        | 0.2        |
|                     | LAAU        | <i>Lamarckia aurea</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                     | GAPA5       | <i>Galium parisiense</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                     | PEAU3       | <i>Pentachaeta aurea</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                     | CRSE11      | <i>Croton setigerus</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                     | GAPH2       | <i>Gastrium phleoides</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|                     | DUCY        | <i>Dudleya cymosa</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                     | PETR7       | <i>Pentagramma triangularis</i>                  | 33         | 0.2        | 0.2        | 0.2        |
|                     | SHERA       | <i>Sherardia</i>                                 | 33         | 0.2        | 0.2        | 0.2        |
|                     | CHME2       | <i>Chorizanthe membranacea</i>                   | 33         | 0.2        | 0.2        | 0.2        |
|                     | HYPE        | <i>Hypericum perforatum</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | TRLA5       | <i>Trichostema laxum</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                     | PEDU2       | <i>Petrorhagia dubia</i>                         | 33         | 0.2        | 0.2        | 0.2        |
|                     | SEWA        | <i>Selaginella wallacei</i>                      | 33         | 0.2        | 0.2        | 0.2        |
|                     | VIHI        | <i>Vicia hirsuta</i>                             | 33         | 0.2        | 0.2        | 0.2        |
|                     | SHAR2       | <i>Sherardia arvensis</i>                        | 33         | 0.2        | 0.2        | 0.2        |
|                     | BRDI2       | <i>Brachypodium distachyon</i>                   | 33         | 0.2        | 0.2        | 0.2        |
|                     | SEVU        | <i>Senecio vulgaris</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                     | SABI3       | <i>Sanicula bipinnatifida</i>                    | 33         | 0.2        | 0.2        | 0.2        |
|                     | RUAC3       | <i>Rumex acetosella</i>                          | 33         | 0.2        | 0.2        | 0.2        |
|                     | POCA12      | <i>Polypodium californicum</i>                   | 33         | 0.2        | 0.2        | 0.2        |
|                     | KOMA        | <i>Koeleria macrantha</i>                        | 33         | 0.1        | 0.1        | 0.1        |
|                     | LOMAT       | <i>Lomatium</i>                                  | 33         | 0.1        | 0.1        | 0.1        |
|                     | MICA7       | <i>Minuartia californica</i>                     | 33         | 0.1        | 0.1        | 0.1        |
|                     | PEAN2       | <i>Pellaea andromedifolia</i>                    | 33         | 0.1        | 0.1        | 0.1        |
|                     | CEME2       | <i>Centaurea melitensis</i>                      | 33         | 0.1        | 0.1        | 0.1        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 33         | 12.0       | 12.0       | 12.0       |

### ***Micropus californicus* Provisional Association**

#### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsection (Miles and Goudey 1997).

#### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 24.0                | 24                   | –                 |
| <b>Herb</b>                          | 24.0                | 24                   | <0.5–0.5          |
| <b>Shrub</b>                         | 0.0                 | 0                    | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0                    | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0                    | –                 |
| <b>Conifer</b>                       | 0.0                 | 0                    | –                 |

\*Includes seedlings and saplings

#### **Summary of Environmental Data**

**Aspect:** SE (1)

**Macrotopography:** middle 1/3 of slope (1)

**Microtopography:** undulating (1)

**Parent material:** Franciscan melange (1)

**Soil texture:** no data

**Slope steepness:** moderate/6-25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 1901 ft.    | 1901 ft.     |
| <b>Slope</b>             | 17.0°       | 17°          |
| <b>Large rock cover</b>  | 0.0%        | 0%           |
| <b>Small rock cover</b>  | 2.0%        | 2%           |
| <b>Bare ground cover</b> | 50.0%       | 50%          |
| <b>Litter cover</b>      | 45.0%       | 45%          |

#### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** SONO0536

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

#### **STAND TABLE**

##### ***Micropus californicus* Provisional Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|----------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                  |            |            |            |            |
|                 | MICA        | <i>Micropus californicus</i>     | 100        | 10.0       | 10.0       | 10.0       |
|                 | LUBI        | <i>Lupinus bicolor</i>           | 100        | 2.0        | 2.0        | 2.0        |
|                 | HYGL2       | <i>Hypochaeris glabra</i>        | 100        | 2.0        | 2.0        | 2.0        |
|                 | LEBI8       | <i>Leptosiphon bicolor</i>       | 100        | 1.0        | 1.0        | 1.0        |
|                 | ERBO        | <i>Erodium botrys</i>            | 100        | 1.0        | 1.0        | 1.0        |
|                 | PLNO        | <i>Plagiobothrys nothofulvus</i> | 100        | 1.0        | 1.0        | 1.0        |
|                 | ERCI6       | <i>Erodium cicutarium</i>        | 100        | 1.0        | 1.0        | 1.0        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Micropus californicus* Provisional Association**

n = 1

| Lifeform | Code  | Botanical Name                 | Con | Avg | Min | Max |
|----------|-------|--------------------------------|-----|-----|-----|-----|
| Herb     | BRHO2 | <i>Bromus hordeaceus</i>       | 100 | 1.0 | 1.0 | 1.0 |
|          | BRMA3 | <i>Bromus madritensis</i>      | 100 | 1.0 | 1.0 | 1.0 |
|          | NAPU4 | <i>Nassella pulchra</i>        | 100 | 0.2 | 0.2 | 0.2 |
|          | WYAN  | <i>Wyethia angustifolia</i>    | 100 | 0.2 | 0.2 | 0.2 |
|          | VUMY  | <i>Vulpia myuros</i>           | 100 | 0.2 | 0.2 | 0.2 |
|          | TRWI3 | <i>Trifolium willdenovii</i>   | 100 | 0.2 | 0.2 | 0.2 |
|          | STME2 | <i>Stellaria media</i>         | 100 | 0.2 | 0.2 | 0.2 |
|          | TRMI4 | <i>Trifolium microcephalum</i> | 100 | 0.2 | 0.2 | 0.2 |
|          | TRHI4 | <i>Trifolium hirtum</i>        | 100 | 0.2 | 0.2 | 0.2 |
|          | AGHE2 | <i>Agoseris heterophylla</i>   | 100 | 0.2 | 0.2 | 0.2 |
|          | COCA5 | <i>Conyza canadensis</i>       | 100 | 0.2 | 0.2 | 0.2 |
|          | PLER3 | <i>Plantago erecta</i>         | 100 | 0.2 | 0.2 | 0.2 |
|          | SCPE  | <i>Scandix pecten-veneris</i>  | 100 | 0.2 | 0.2 | 0.2 |
|          | BRDI3 | <i>Bromus diandrus</i>         | 100 | 0.2 | 0.2 | 0.2 |
|          | ATPU  | <i>Athysanus pusillus</i>      | 100 | 0.2 | 0.2 | 0.2 |
|          | EPCA3 | <i>Epilobium canum</i>         | 100 | 0.2 | 0.2 | 0.2 |
|          | GAPA5 | <i>Galium parisiense</i>       | 100 | 0.2 | 0.2 | 0.2 |
|          | LATHY | <i>Lathyrus</i>                | 100 | 0.2 | 0.2 | 0.2 |
|          | LOWR2 | <i>Lotus wrangelianus</i>      | 100 | 0.2 | 0.2 | 0.2 |
|          | PENA2 | <i>Petrorhagia nanteuillii</i> | 100 | 0.2 | 0.2 | 0.2 |
|          | POSE  | <i>Poa secunda</i>             | 100 | 0.2 | 0.2 | 0.2 |
|          | SABI3 | <i>Sanicula bipinnatifida</i>  | 100 | 0.2 | 0.2 | 0.2 |

***Vulpia microstachys* – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (4) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 32.0         | 16–43         | –          |
| <b>Herb</b>                          | 32.0         | 16–43         | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (2), SE (2)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (2), upper 1/3 of slope (3)

**Microtopography:** convex (3), flat (1), undulating (2)

**Parent material:** serpentine (4), ultramafic (1), volcanic (1)

**Soil texture:** clay or clay loam (3), sand (1)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (3)



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

|                   | Mean    | Range        |
|-------------------|---------|--------------|
| Elevation         | 805 ft. | 198–1420 ft. |
| Slope             | 12.6°   | 1–25°        |
| Large rock cover  | 14.8%   | 1–35%        |
| Small rock cover  | 30.8%   | 3–67%        |
| Bare ground cover | 24.5%   | 10–59%       |
| Litter cover      | 11.7%   | 5–17%        |

**Samples Used to Describe Association (n=6)**

**Rapid Assessments:** MILOB020

**Relevés:** HEAD0392, HEAD0394, HEAD0412, SONO0356, SONO2200

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

**STAND TABLE**

***Vulpia microstachys* – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)* Association**

n = 6

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     |        |  |     |      |      |      |
|          | PLER3  | <i>Plantago erecta</i>                               | 100 | 3.9  | 0.2  | 8.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                           | 100 | 2.0  | 0.2  | 6.0  |
|          | LOPE   | <i>Lolium perenne</i>                                | 83  | 1.5  | 0.2  | 3.0  |
|          | ELMU3  | <i>Elymus multisetus</i>                             | 67  | 4.8  | 0.2  | 8.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 67  | 3.8  | 0.2  | 8.0  |
|          | MIDO3  | <i>Minuartia douglasii</i>                           | 67  | 1.1  | 0.2  | 3.0  |
|          | LOHU2  | <i>Lotus humistratus</i>                             | 67  | 1.1  | 0.2  | 3.0  |
|          | LACA7  | <i>Lasthenia californica</i>                         | 50  | 13.1 | 0.2  | 38.0 |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 50  | 6.3  | 3.0  | 8.0  |
|          | HESP9  | * <i>Hesperervax sparsiflora</i>                     | 50  | 3.1  | 0.2  | 8.0  |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 50  | 2.3  | 1.0  | 3.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                          | 50  | 2.1  | 0.2  | 3.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 50  | 1.4  | 0.2  | 3.0  |
|          | KOMA   | <i>Koeleria macrantha</i>                            | 50  | 1.1  | 0.1  | 3.0  |
|          | EPMI   | <i>Epilobium minutum</i>                             | 50  | 0.5  | 0.2  | 1.0  |
|          | LODA   | <i>Lomatium dasycarpum</i>                           | 50  | 0.5  | 0.2  | 1.0  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 50  | 0.5  | 0.2  | 1.0  |
|          | AICA   | <i>Aira caryophyllea</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|          | DAPU3  | <i>Daucus pusillus</i>                               | 50  | 0.2  | 0.2  | 0.2  |
|          | ELGL   | <i>Elymus glaucus</i>                                | 50  | 0.2  | 0.2  | 0.2  |
|          | CAMU3  | <i>Calycadenia multiglandulosa</i>                   | 33  | 28.0 | 18.0 | 38.0 |
|          | LER3   | <i>Lessingia ramulosa</i>                            | 33  | 5.5  | 3.0  | 8.0  |
|          | IRMA   | <i>Iris macrosiphon</i>                              | 33  | 4.1  | 0.2  | 8.0  |
|          | GRHI   | <i>Grindelia hirsutula</i>                           | 33  | 4.1  | 0.2  | 8.0  |
|          | AGHE2  | <i>Agoseris heterophylla</i>                         | 33  | 2.0  | 1.0  | 3.0  |
|          | CACO35 | <i>Calystegia collina</i>                            | 33  | 2.0  | 1.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Vulpia microstachys* – *Plantago erecta* – *Calycadenia (truncata, multiglandulosa)* Association**

n = 6

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                    | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | POSE        | <i>Poa secunda</i>                                       | 33         | 1.6        | 0.2        | 3.0        |
|                     | MOPU2       | <i>Monardella purpurea</i>                               | 33         | 1.6        | 0.2        | 3.0        |
|                     | MICRO6      | <i>Microseris</i>  | 33         | 1.6        | 0.2        | 3.0        |
|                     | TRDI6       | <i>Trifolium dichotomum</i>                              | 33         | 1.6        | 0.2        | 3.0        |
|                     | MIDO        | <i>Microseris douglasii</i>                              | 33         | 1.5        | 1.0        | 2.0        |
|                     | COSP        | <i>Collinsia sparsiflora</i>                             | 33         | 1.0        | 1.0        | 1.0        |
|                     | SIBE        | <i>Sisyrinchium bellum</i>                               | 33         | 0.6        | 0.2        | 1.0        |
|                     | TRWI3       | <i>Trifolium willdenovii</i>                             | 33         | 0.6        | 0.2        | 1.0        |
|                     | SIGA        | <i>Silene gallica</i>                                    | 33         | 0.6        | 0.1        | 1.0        |
|                     | ERLU5       | <i>Eriogonum luteolum</i>                                | 33         | 0.2        | 0.2        | 0.2        |
|                     | CYEC        | <i>Cynosurus echinatus</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                     | CASUS2      | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>      | 33         | 0.2        | 0.2        | 0.2        |
|                     | GICAT2      | <i>Gilia capitata</i> ssp. <i>tomentosa</i>              | 33         | 0.2        | 0.2        | 0.2        |
|                     | HESPS2      | * <i>Hesperervax sparsiflora</i> var. <i>sparsiflora</i> | 33         | 0.2        | 0.2        | 0.2        |
|                     | NALE2       | <i>Nassella lepida</i>                                   | 33         | 0.2        | 0.2        | 0.2        |
|                     | TRBI        | <i>Trifolium bifidum</i>                                 | 33         | 0.2        | 0.2        | 0.2        |
|                     | LASA        | <i>Lactuca saligna</i>                                   | 33         | 0.2        | 0.1        | 0.2        |
|                     | STGLS       | <i>Streptanthus glandulosus</i> ssp. <i>secundus</i>     | 33         | 0.2        | 0.1        | 0.2        |
|                     | EPBR3       | <i>Epilobium brachycarpum</i>                            | 33         | 0.2        | 0.1        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 33         | 6.5        | 5.0        | 8.0        |
|                     | 2LICHN      | Lichen   | 33         | 4.0        | 2.0        | 6.0        |

**Noteworthy Taxa**

*Gilia capitata* ssp. *tomentosa*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G5T2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Lasthenia glaberrima* Alliance**  
**Smooth goldfields vernal pool bottoms**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Lasthenia glaberrima* is co-dominant or characteristically present in the herbaceous layer with *Alopecurus saccatus*, *Callitriche marginata*, *Castilleja campestris*, *Centromadia fitchii*, *Crassula aquatica*, *Distichlis spicata*, *Downingia bicornuta*, *Downingia cuspidata*, *Downingia insignis*, *Eleocharis macrostachya*, *Eryngium* spp., *Glyceria occidentalis*, *Gratiola ebracteata*, *Holocarpha virgata*, *Isoetes howellii*, *Lasthenia fremontii*, *Lilaea scilloides*, *Lupinus bicolor*, *Lythrum hyssopifolia*, *Lythrum portula*, *Myosurus minimus*, *Plagiobothrys stipitatus* var. *micranthus*, *Pleuropogon californicus*, *Pogogyne douglasii*, *Psilocarphus brevissimus* var. *brevissimus*, *Ranunculus bonariensis* var. *trisepalus*, and *Trifolium variegatum*. Other common species include *Hordeum marinum*, *Leontodon saxatilis*, *Lolium perenne*, or *Polypogon monspeliensis*.

Barbour et al. (2003, 2007b) recognized the *Downingia* – *Lasthenia* Class for California vernal pool vegetation on all geomorphic surfaces, landscapes, and soil types in the Central Valley and adjacent foothills. Within that class, Barbour et al. recognized this *Lasthenia glaberrima* Alliance for vegetation of deeper pools bottoms. The alliance has a high constancy and abundance of *Lasthenia glaberrima* and *Eleocharis macrostachya*, which are extremely flood tolerant. Associations in this alliance differ from other freshwater vernal pool alliances in their absence or much lower constancy of species adapted to short inundation periods such as *Blennosperma nanum* var. *nanum*, *Centromadia fitchii*, *Cicendia quadrangularis*, *Downingia cuspidata*, *Lepidium nitidum*, *Limnanthes douglasii* ssp. *rosea*, *Plagiobothrys greenei*, and *Trifolium depauperatum*. Lengthy inundation also leads to a lower degree of invasion by non-natives. However, stands do have *Downingia bicornuta* and *Eryngium castrense*, which grow across pools of varying degrees of inundation.

The *Lasthenia glaberrima* Alliance occurs on a variety of geomorphic surfaces, landforms, and soil series. Stands occur primarily in freshwater pools but sometimes occur in slightly saline/alkaline pools. Within the alliance are six associations: three that are characteristic of hardpan and volcanic rock pools, and three that are found in claypan pools (Barbour et al. 2007b).

Sonoma County

A single *Lasthenia glaberrima* stand was sampled near the Sears Point Raceway in an isolated vernal pool surrounded by grazed grassland. Other stands may be represented in the vernal pool data set analyzed separately from this report in the Santa Rosa Plain area, west of the city of Santa Rosa.

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**Local Alliance Summary (n = 1)**

**Elevation:** 255 ft

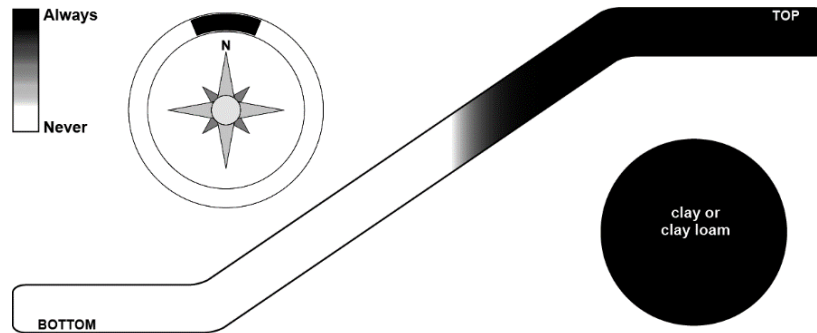
**SCV Global/State Rank:** G3/S3<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 80.0         | 80            | –          |
| <b>Herb</b>                          | 80.0         | 80            | –          |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 1.0%  | 1%    |
| <b>Litter cover</b>      | 60.0% | 60%   |

**Associations within this Alliance:**

*Lasthenia glaberrima* – *Pleuropogon californicus* Association

**STAND TABLE**

***Lasthenia glaberrima* Alliance**

n = 1

| Lifeform | Code   | Botanical Name                  | Con | Avg  | Min  | Max  |
|----------|--------|---------------------------------|-----|------|------|------|
| Herb     | ELPA3  | <i>Eleocharis palustris</i>     | 100 | 38.0 | 38.0 | 38.0 |
|          | PLCA6  | <i>Pleuropogon californicus</i> | 100 | 38.0 | 38.0 | 38.0 |
|          | ERAR12 | <i>Eryngium armatum</i>         | 100 | 18.0 | 18.0 | 18.0 |
|          | LISC4  | <i>Lilaea scilloides</i>        | 100 | 3.0  | 3.0  | 3.0  |
|          | PLBR   | <i>Plagiobothrys bracteatus</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | POMO5  | <i>Polypogon monspeliensis</i>  | 100 | 3.0  | 3.0  | 3.0  |
|          | COCO7  | <i>Cotula coronopifolia</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | LAGL3  | <i>Lasthenia glaberrima</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | RUCR   | <i>Rumex crispus</i>            | 100 | 0.2  | 0.2  | 0.2  |

***Lasthenia glaberrima* – *Pleuropogon californicus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 80.0         | 80            | –          |
| Herb                          | 80.0         | 80            | –          |
| Shrub                         | 0.0          | 0             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1)

**Macrotopography:** upper 1/3 of slope to ridgetop (1)

**Microtopography:** flat (1)

**Parent material:** sedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (1)

|                   | Mean    | Range   |
|-------------------|---------|---------|
| Elevation         | 255 ft. | 255 ft. |
| Slope             | 0.0°    | 0°      |
| Bare ground cover | 1.0%    | 1%      |
| Litter cover      | 60.0%   | 60%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** HEAD0344

**SCV Global/State Rank:** G2?/S2?¹

**STAND TABLE**

***Lasthenia glaberrima* – *Pleuropogon californicus* Association**

n = 1

| Lifeform | Code   | Botanical Name                  | Con | Avg  | Min  | Max  |
|----------|--------|---------------------------------|-----|------|------|------|
| Herb     |        |                                 |     |      |      |      |
|          | PLCA6  | <i>Pleuropogon californicus</i> | 100 | 38.0 | 38.0 | 38.0 |
|          | ELPA3  | <i>Eleocharis palustris</i>     | 100 | 38.0 | 38.0 | 38.0 |
|          | ERAR12 | <i>Eryngium armatum</i>         | 100 | 18.0 | 18.0 | 18.0 |
|          | POMO5  | <i>Polypogon monspeliensis</i>  | 100 | 3.0  | 3.0  | 3.0  |
|          | PLBR   | <i>Plagiobothrys bracteatus</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | LISC4  | <i>Lilaea scilloides</i>        | 100 | 3.0  | 3.0  | 3.0  |
|          | RUCR   | <i>Rumex crispus</i>            | 100 | 0.2  | 0.2  | 0.2  |
|          | LAGL3  | <i>Lasthenia glaberrima</i>     | 100 | 0.2  | 0.2  | 0.2  |
|          | COCO7  | <i>Cotula coronopifolia</i>     | 100 | 0.2  | 0.2  | 0.2  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Lepidium latifolium* Semi-Natural Alliance**  
**Perennial pepperweed patches**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Lepidium latifolium* is dominant in the herbaceous layer. Emergent trees and shrubs may be present at low cover.

*Lepidium latifolium* is invading riparian and wetland settings in California. Plants expand rapidly and form extensive, dense patches in both freshwater and brackish water sites in the state. This invasion is magnified in disturbed brackish marshes of the San Francisco Bay estuary, where *L. latifolium* invades first after disturbance along levees and then spreads into diked and tidal wetlands.

Sonoma County

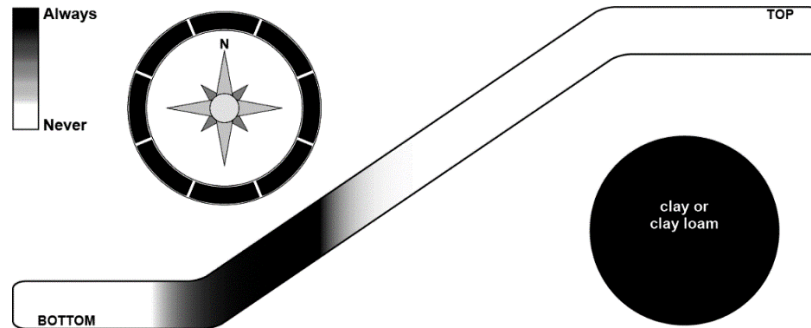
Perennial pepperweed is a noxious weed that dominates stands adjacent to salt and brackish marshes in a few parts of the county. The single sampled stand occurred at the edge of a brackish marsh at Tolay Creek, east of the Sears Point Raceway.

**Local Alliance Summary (n = 1)**

**Elevation:** 8 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 32.0         | 32            | –          |
| <b>Herb</b>                          | 32.0         | 32            | 1–2        |
| <b>Shrub</b>                         | 0.2          | 0.2           | 2–5        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 0.0°  | 0°    |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 0.0%  | 0%    |
| Bare ground cover | 1.0%  | 1%    |
| Litter cover      | 97.0% | 97%   |

**Associations within this Alliance:**

*Lepidium latifolium* – *Distichlis spicata* Semi-Natural Association

**STAND TABLE**

***Lepidium latifolium* Semi-Natural Alliance**

n = 1

| Lifeform | Code  | Botanical Name               | Con | Avg  | Min  | Max  |
|----------|-------|------------------------------|-----|------|------|------|
| Shrub    | SALA6 | <i>Salix lasiolepis</i>      | 100 | 0.2  | 0.2  | 0.2  |
| Herb     | LELA2 | <i>Lepidium latifolium</i>   | 100 | 21.0 | 21.0 | 21.0 |
|          | COMA2 | <i>Conium maculatum</i>      | 100 | 4.0  | 4.0  | 4.0  |
|          | LETR5 | <i>Leymus triticoides</i>    | 100 | 4.0  | 4.0  | 4.0  |
|          | CAPY2 | <i>Carduus pycnocephalus</i> | 100 | 2.0  | 2.0  | 2.0  |
|          | DISP  | <i>Distichlis spicata</i>    | 100 | 1.0  | 1.0  | 1.0  |
|          | JUAR2 | <i>Juncus arcticus</i>       | 100 | 1.0  | 1.0  | 1.0  |
|          | BRNI  | <i>Brassica nigra</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | LOPE  | <i>Lolium perenne</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | SOOL  | <i>Sonchus oleraceus</i>     | 100 | 0.2  | 0.2  | 0.2  |

***Lepidium latifolium* – *Distichlis spicata* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 32.0         | 32            | –          |
| Herb                          | 32.0         | 32            | 1–2        |
| Shrub                         | 0.2          | 0.2           | 2–5        |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1)

**Macrotopography:** lower 1/3 of slope (1)

**Microtopography:** flat (1)

**Parent material:** sandy alluvium (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (1)

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|                   | Mean  | Range |
|-------------------|-------|-------|
| Elevation         | 8 ft. | 8 ft. |
| Slope             | 0.0°  | 0°    |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 0.0%  | 0%    |
| Bare ground cover | 1.0%  | 1%    |
| Litter cover      | 97.0% | 97%   |

**Samples Used to Describe Association (n=1)**

Rapid Assessments: SONO0424

Relevés: none

SCV Global/State Rank: Not ranked – semi-natural association.

**STAND TABLE**

***Lepidium latifolium* – *Distichlis spicata* Semi-Natural Association**

n = 1

| Lifeform | Code  | Botanical Name               | Con | Avg  | Min  | Max  |
|----------|-------|------------------------------|-----|------|------|------|
| Shrub    | SALA6 | <i>Salix lasiolepis</i>      | 100 | 0.2  | 0.2  | 0.2  |
| Herb     | LELA2 | <i>Lepidium latifolium</i>   | 100 | 21.0 | 21.0 | 21.0 |
|          | LETR5 | <i>Leymus triticoides</i>    | 100 | 4.0  | 4.0  | 4.0  |
|          | COMA2 | <i>Conium maculatum</i>      | 100 | 4.0  | 4.0  | 4.0  |
|          | CAPY2 | <i>Carduus pycnocephalus</i> | 100 | 2.0  | 2.0  | 2.0  |
|          | DISP  | <i>Distichlis spicata</i>    | 100 | 1.0  | 1.0  | 1.0  |
|          | JUAR2 | <i>Juncus arcticus</i>       | 100 | 1.0  | 1.0  | 1.0  |
|          | BRNI  | <i>Brassica nigra</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | LOPE  | <i>Lolium perenne</i>        | 100 | 0.2  | 0.2  | 0.2  |
|          | SOOL  | <i>Sonchus oleraceus</i>     | 100 | 0.2  | 0.2  | 0.2  |



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***Leymus mollis* Alliance**  
**Sea lyme grass patches**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Leymus mollis* is dominant or characteristically present in the herbaceous layer with *Abronia latifolia*, *Achillea millefolium*, *Ambrosia chamissonis*, *Ammophila arenaria*, *Artemisia pycnocephala*, *Cakile* spp., *Calystegia soldanella*, *Carpobrotus chilensis*, *Lathyrus littoralis*, *Poa douglasii*, and *Poa macrantha*.

Because *Leymus mollis* is an obligate psammophyte, it thrives under conditions of active sand accretion of nearshore dunes and upper beaches (Pickart and Barbour 2007). *Leymus mollis* and *Abronia umbellata* ssp. *breviflora* (a CA rare plant with a rank of 1B.1) grow in the same habitat as the invasive non-native grass *Ammophila arenaria*, which has reduced and replaced these native species over much of their ranges in California. *Leymus mollis* stands fluctuate between being grass- and herb-dominated. They are generally small (< 0.5 ha) and patchy and intermix with stands of the *Abronia latifolia* – *Ambrosia chamissonis* Alliance.

Sonoma County

The single sampled *Leymus mollis* stand occurred on sand adjacent to the mouth of Salmon Creek near Bodega Bay. It was less than 0.5 ha in size and occurred adjacent to stands of *Grindelia stricta* and *Juncus lescurii*.

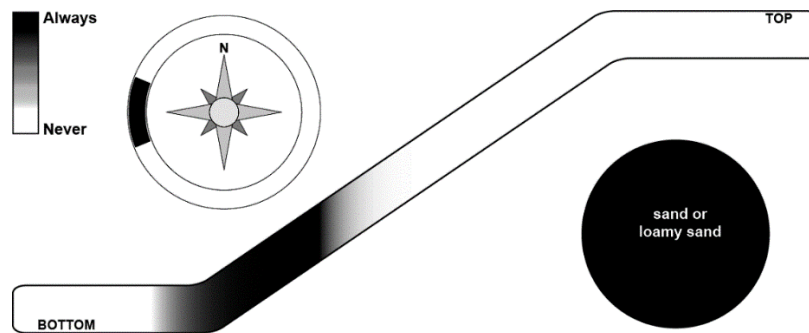
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**Local Alliance Summary (n = 1)**

**Elevation:** 12 ft

**SCV Global/State Rank:** G4/S2<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 19.0         | 19            | –          |
| <b>Herb</b>                          | 19.0         | 19            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 2.0°  | 2°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 91.0% | 91%   |
| <b>Litter cover</b>      | 7.0%  | 7%    |

**Associations within this Alliance:**

*Leymus mollis* – *Abronia latifolia* – (*Cakile* spp.) Association

**STAND TABLE**

***Leymus mollis* Alliance**

n = 1

| Lifeform | Code   | Botanical Name                          | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Herb     |        |   |     |      |      |      |
|          | LEMOM2 | <i>Leymus mollis</i> ssp. <i>mollis</i> | 100 | 17.0 | 17.0 | 17.0 |
|          | AMCH4  | <i>Ambrosia chamissonis</i>             | 100 | 3.0  | 3.0  | 3.0  |
|          | ARPY3  | <i>Artemisia pycnocephala</i>           | 100 | 0.2  | 0.2  | 0.2  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | CAMA   | <i>Cakile maritima</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|          | CLAYT  | <i>Claytonia</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | CONYZ  | <i>Conyza</i>                           | 100 | 0.2  | 0.2  | 0.2  |

***Leymus mollis* – *Abronia latifolia* – (*Cakile* spp.) Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 19.0         | 19            | –          |
| <b>Herb</b>                          | 19.0         | 19            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

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**Summary of Environmental Data**

**Aspect:** NW (1)  
**Macrotopography:** lower 1/3 of slope (1)  
**Microtopography:** undulating (1)  
**Parent material:** sand dunes (1)  
**Soil texture:** sand (1)  
**Slope steepness:** gentle/1-5° (1)

|                          | Mean   | Range  |
|--------------------------|--------|--------|
| <b>Elevation</b>         | 12 ft. | 12 ft. |
| <b>Slope</b>             | 2.0°   | 2°     |
| <b>Large rock cover</b>  | 0.0%   | 0%     |
| <b>Small rock cover</b>  | 0.0%   | 0%     |
| <b>Bare ground cover</b> | 91.0%  | 91%    |
| <b>Litter cover</b>      | 7.0%   | 7%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO0446

**SCV Global/State Rank:** G2?/S2?<sup>1</sup>

**STAND TABLE**

***Leymus mollis* – *Abronia latifolia* – (*Cakile* spp.) Association**

n = 1

| Lifeform | Code   | Botanical Name                          | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Herb     | LEMOM2 | <i>Leymus mollis</i> ssp. <i>mollis</i> | 100 | 17.0 | 17.0 | 17.0 |
|          | AMCH4  | <i>Ambrosia chamissonis</i>             | 100 | 3.0  | 3.0  | 3.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                | 100 | 0.2  | 0.2  | 0.2  |
|          | CONYZ  | <i>Conyza</i>                           | 100 | 0.2  | 0.2  | 0.2  |
|          | CAMA   | <i>Cakile maritima</i>                  | 100 | 0.2  | 0.2  | 0.2  |
|          | ARPY3  | <i>Artemisia pycnocephala</i>           | 100 | 0.2  | 0.2  | 0.2  |
|          | CLAYT  | <i>Claytonia</i>                        | 100 | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Leymus triticoides* Alliance**  
**Creeping rye grass turfs**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Leymus triticoides* is dominant or co-dominant in the herbaceous layer with *Ambrosia psilostachya*, *Anemopsis californica*, *Aristida purpurea*, *Avena fatua*, *Bromus* spp., *Danthonia unispicata*, *Distichlis spicata*, *Elymus elymoides*, *Hordeum* spp., *Juncus arcticus*, *Lolium perenne*, *Poa secunda*, and *Triglochin maritima*. Emergent trees and shrubs may be present at low cover.

The National Vegetation Classification (NatureServe 2007a) defined the *Leymus triticoides* Alliance based on alkali or salt meadow studies in the Great Basin (Blackburn et al. 1969a, 1969b, Easterday and Mamone 1980), but the definition has been expanded to include stands in the Great Valley as described by Holstein (2001). The Great Valley stands occurred on heavy clay or loam soils and on flat to sloping topography, and in transitional areas between riparian and marsh habitats. Recent studies (Evens and San 2004, Holstein 2001, Keeler-Wolf and Vaghti 2000, Solomeshch and Barbour 2006) have clearly distinguished stands strongly dominated by *Leymus triticoides* from other alliances.

Sonoma County

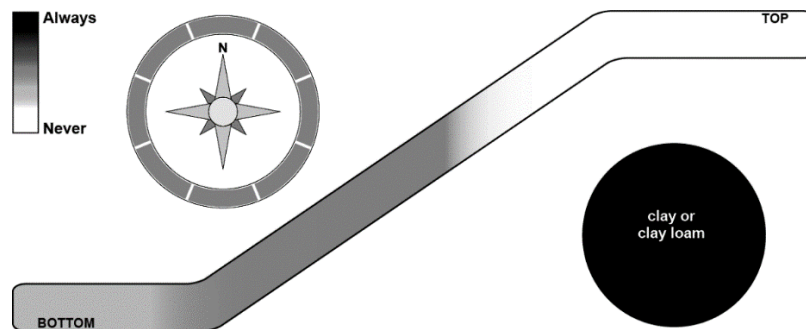
Stands of the *Leymus triticoides* Alliance occur adjacent to edges of salt or brackish marshes as at Tolay Creek, in ravines or swales, or in mesic grasslands in the interior of the county as at Austin Creek State Recreation Area.

**Local Alliance Summary (n = 5)**

**Elevation:** 6–719 ft, mean 169 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 59.2         | 33–95         | –          |
| <b>Herb</b>             | 59.2         | 33–95         | <0.5–1     |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Summary of Environmental Data

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 3.6°  | 0–9°   |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.0%  | 0–0%   |
| Bare ground cover | 16.2% | 0–67%  |
| Litter cover      | 80.4% | 30–97% |

Associations within this Alliance:

*Leymus triticoides* – *Lolium perenne* Association  
*Leymus triticoides* Association

**STAND TABLE**

*Leymus triticoides* Alliance

n = 5

| Lifeform | Code   | Botanical Name               | Con | Avg  | Min  | Max  |
|----------|--------|------------------------------|-----|------|------|------|
| Herb     | LETR5  | <i>Leymus triticoides</i>    | 100 | 34.4 | 8.0  | 85.0 |
|          | LOPE   | <i>Lolium perenne</i>        | 40  | 52.5 | 25.0 | 80.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>     | 40  | 2.5  | 1.0  | 4.0  |
|          | RUMEX  | <i>Rumex</i>                 | 40  | 0.6  | 0.2  | 1.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i> | 40  | 0.2  | 0.2  | 0.2  |
|          | GEDI   | <i>Geranium dissectum</i>    | 40  | 0.2  | 0.2  | 0.2  |
|          | BRMA   | <i>Briza maxima</i>          | 20  | 18.0 | 18.0 | 18.0 |
|          | PIEC   | <i>Picris echioides</i>      | 20  | 6.0  | 6.0  | 6.0  |
|          | PLLA   | <i>Plantago lanceolata</i>   | 20  | 5.0  | 5.0  | 5.0  |
|          | NAPU4  | <i>Nassella pulchra</i>      | 20  | 3.0  | 3.0  | 3.0  |
|          | JUPA2  | <i>Juncus patens</i>         | 20  | 2.0  | 2.0  | 2.0  |
|          | NAIN2  | <i>Navarretia intertexta</i> | 20  | 2.0  | 2.0  | 2.0  |
|          | COAR4  | <i>Convolvulus arvensis</i>  | 20  | 1.0  | 1.0  | 1.0  |
|          | DISP   | <i>Distichlis spicata</i>    | 20  | 1.0  | 1.0  | 1.0  |
|          | RASA2  | <i>Raphanus sativus</i>      | 20  | 1.0  | 1.0  | 1.0  |
|          | ANAGA  | <i>Anagallis</i>             | 20  | 0.2  | 0.2  | 0.2  |
|          | AVBA   | <i>Avena barbata</i>         | 20  | 0.2  | 0.2  | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>       | 20  | 0.2  | 0.2  | 0.2  |
|          | 2FEAR3 | <i>Festuca arundinacea</i>   | 20  | 0.2  | 0.2  | 0.2  |
|          | JUNCU  | <i>Juncus</i>                | 20  | 0.2  | 0.2  | 0.2  |
|          | JUPH   | <i>Juncus phaeocephalus</i>  | 20  | 0.2  | 0.2  | 0.2  |
|          | LASA   | <i>Lactuca saligna</i>       | 20  | 0.2  | 0.2  | 0.2  |
|          | LAAN3  | <i>Lathyrus angulatus</i>    | 20  | 0.2  | 0.2  | 0.2  |
|          | MALE3  | <i>Malvella leprosa</i>      | 20  | 0.2  | 0.2  | 0.2  |
|          | MEPO3  | <i>Medicago polymorpha</i>   | 20  | 0.2  | 0.2  | 0.2  |
|          | RUCR   | <i>Rumex crispus</i>         | 20  | 0.2  | 0.2  | 0.2  |
|          | VISA   | <i>Vicia sativa</i>          | 20  | 0.2  | 0.2  | 0.2  |

## ***Leymus triticoides* – *Lolium perenne* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (2) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 70.0                | 45–95                | –                 |
| <b>Herb</b>                          | 70.0                | 45–95                | <0.5–1            |
| <b>Shrub</b>                         | 0.0                 | 0–0                  | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (1), SW (1)

**Macrotopography:** bottom (1), lower 1/3 of slope (1)

**Microtopography:** flat (1), undulating (1)

**Parent material:** sandstone (2)

**Soil texture:** no data

**Slope steepness:** flat/0° (1), gentle/1-5° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 56 ft.      | 47–65 ft.    |
| <b>Slope</b>             | 2.0°        | 0–4°         |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 0.0%        | 0–0%         |
| <b>Bare ground cover</b> | 6.5%        | 3–10%        |
| <b>Litter cover</b>      | 89.0%       | 83–95%       |

### **Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none

**Relevés:** SONO0664, SONO0678

**SCV Global/State Rank:** G3/S3<sup>1</sup>

### **STAND TABLE**

#### ***Leymus triticoides* – *Lolium perenne* Association**

n = 2

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>       | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|-----------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                             |            |            |            |            |
|                 | LOPE        | <i>Lolium perenne</i>       | 100        | 52.5       | 25.0       | 80.0       |
|                 | LETR5       | <i>Leymus triticoides</i>   | 100        | 22.0       | 9.0        | 35.0       |
|                 | RUMEX       | <i>Rumex</i>                | 100        | 0.6        | 0.2        | 1.0        |
|                 | PIEC        | <i>Picris echioides</i>     | 50         | 6.0        | 6.0        | 6.0        |
|                 | PLLA        | <i>Plantago lanceolata</i>  | 50         | 5.0        | 5.0        | 5.0        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>    | 50         | 4.0        | 4.0        | 4.0        |
|                 | COAR4       | <i>Convolvulus arvensis</i> | 50         | 1.0        | 1.0        | 1.0        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Leymus triticoides* – *Lolium perenne* Association**

n = 2

| Lifeform | Code   | Botanical Name               | Con | Avg | Min | Max |
|----------|--------|------------------------------|-----|-----|-----|-----|
| Herb     | JUPH   | <i>Juncus phaeocephalus</i>  | 50  | 0.2 | 0.2 | 0.2 |
|          | CAPY2  | <i>Carduus pycnocephalus</i> | 50  | 0.2 | 0.2 | 0.2 |
|          | 2FEAR3 | <i>Festuca arundinacea</i>   | 50  | 0.2 | 0.2 | 0.2 |
|          | GEDI   | <i>Geranium dissectum</i>    | 50  | 0.2 | 0.2 | 0.2 |
|          | JUNCU  | <i>Juncus</i>                | 50  | 0.2 | 0.2 | 0.2 |
|          | LASA   | <i>Lactuca saligna</i>       | 50  | 0.2 | 0.2 | 0.2 |
|          | VISA   | <i>Vicia sativa</i>          | 50  | 0.2 | 0.2 | 0.2 |
|          | MEPO3  | <i>Medicago polymorpha</i>   | 50  | 0.2 | 0.2 | 0.2 |

***Leymus triticoides* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 52.0         | 33–85         | –          |
| Herb                          | 52.0         | 33–85         | 0.5–1      |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1), NW (1), SW (1)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (2)

**Microtopography:** flat (2), undulating (1)

**Parent material:** mixed alluvium (1), sandy alluvium (1), sedimentary (1)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** flat/0° (1), gentle/1-5° (1), moderate/6-25° (1)

|                   | Mean    | Range     |
|-------------------|---------|-----------|
| Elevation         | 245 ft. | 6–719 ft. |
| Slope             | 4.7°    | 0–9°      |
| Large rock cover  | 0.0%    | 0–0%      |
| Small rock cover  | 0.1%    | 0–0.2%    |
| Bare ground cover | 22.7%   | 0–67%     |
| Litter cover      | 74.7%   | 30–97%    |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** SONO0423, SONO0546, SONO0667

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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SCV Global/State Rank: G4/S3<sup>1</sup>

**STAND TABLE**

***Leymus triticoides* Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                              |            |            |            |            |
|                 | LETR5       | <i>Leymus triticoides</i>    | 100        | 42.7       | 8.0        | 85.0       |
|                 | BRMA        | <i>Briza maxima</i>          | 33         | 18.0       | 18.0       | 18.0       |
|                 | NAPU4       | <i>Nassella pulchra</i>      | 33         | 3.0        | 3.0        | 3.0        |
|                 | JUPA2       | <i>Juncus patens</i>         | 33         | 2.0        | 2.0        | 2.0        |
|                 | NAIN2       | <i>Navarretia intertexta</i> | 33         | 2.0        | 2.0        | 2.0        |
|                 | DISP        | <i>Distichlis spicata</i>    | 33         | 1.0        | 1.0        | 1.0        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>     | 33         | 1.0        | 1.0        | 1.0        |
|                 | RASA2       | <i>Raphanus sativus</i>      | 33         | 1.0        | 1.0        | 1.0        |
|                 | ANAGA       | <i>Anagallis</i>             | 33         | 0.2        | 0.2        | 0.2        |
|                 | RUCR        | <i>Rumex crispus</i>         | 33         | 0.2        | 0.2        | 0.2        |
|                 | MALE3       | <i>Malvella leprosa</i>      | 33         | 0.2        | 0.2        | 0.2        |
|                 | LAAN3       | <i>Lathyrus angulatus</i>    | 33         | 0.2        | 0.2        | 0.2        |
|                 | GED1        | <i>Geranium dissectum</i>    | 33         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>       | 33         | 0.2        | 0.2        | 0.2        |
|                 | CAPY2       | <i>Carduus pycnocephalus</i> | 33         | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>         | 33         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



## ***Lolium perenne* Semi-Natural Alliance**

### **Perennial rye grass fields**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Lolium perenne* is dominant or co-dominant with other non-natives in the herbaceous layer with *Agrostis stolonifera*, *Alopecurus aequalis*, *Asclepias fascicularis*, *Avena fatua*, *Brassica nigra*, *Bromus diandrus*, *Bromus hordeaceus*, *Centaurium muehlenbergii*, *Cirsium vulgare*, *Cryptantha flaccida*, *Euphorbia spathulata*, *Festuca arundinacea*, *Holcus lanatus*, *Hordeum brachyantherum*, *Hordeum marinum*, *Leontodon saxatilis*, *Leymus triticoides*, *Lotus corniculatus*, *Microseris douglasii*, *Nassella pulchra*, *Nasturtium officinale*, *Phalaris aquatica*, *Plantago erecta*, *Poa pratensis*, *Rumex crispus*, and *Trifolium* spp. Emergent trees and shrubs may be present at low cover.

*Lolium perenne* is a widespread and adaptable grass in cismontane California, and the plants grow in a wide range of soil types, except for those excessively drained. Many herbaceous alliances have significant cover of *L. perenne*, including stands of the *Eleocharis macrostachya*, *Juncus arcticus* (var. *balticus*, *mexicanus*), *Leymus triticoides*, *Muhlenbergia rigens*, *Plagiobothrys nothofulvus*, and *Trifolium variegatum* Alliances. While membership rules vary among studies, Sawyer et al. (2009) consider stands to be included in this type if *Lolium perenne* is a strong dominant, either alone or with other non-natives, largely to the exclusion of native plants. Generally, this type occurs in seasonally moist to wet environments that are regularly disturbed through grazing, fire, flooding, or mechanical means.

#### Sonoma County

*Lolium perenne* stands were most commonly sampled on the clay-rich hills of the southeastern portion of the county. They frequently occur adjacent to the *Avena* spp. – *Bromus* spp. Semi-Natural Alliance or the *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance on shallow or chemically harsh soils.

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#### **Local Alliance Summary (n = 23)**

**Elevation:** 29–775 ft, mean 329 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

#### **Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

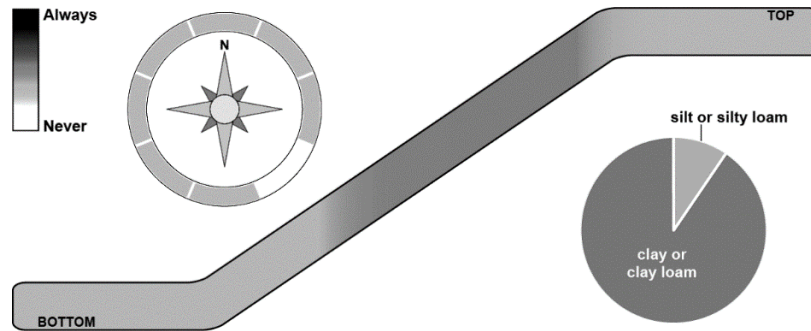
CA rare plant rank: 1B.2

NatureServe global/state rank: G5T1T2/S1S2

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 73.6         | 50–100        | –          |
| <b>Herb</b>                          | 73.9         | 50–100        | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 8.3°  | 0–25°  |
| <b>Large rock cover</b>  | 0.2%  | 0–2%   |
| <b>Small rock cover</b>  | 0.9%  | 0–5%   |
| <b>Bare ground cover</b> | 12.7% | 0–72%  |
| <b>Litter cover</b>      | 68.0% | 15–95% |

**Associations within this Alliance:**

*Lolium perenne* Semi-Natural Association

**STAND TABLE**

***Lolium perenne* Semi-Natural Alliance**

n = 23

| Lifeform | Code  | Botanical Name                                 | Con | Avg  | Min | Max  |
|----------|-------|--|-----|------|-----|------|
| Herb     | LOPE  | <i>Lolium perenne</i>                          | 100 | 51.2 | 8.0 | 88.0 |
|          | MEPO3 | <i>Medicago polymorpha</i>                     | 87  | 4.5  | 0.1 | 18.0 |
|          | BRHO2 | <i>Bromus hordeaceus</i>                       | 78  | 7.4  | 0.2 | 18.0 |
|          | TRSU3 | <i>Trifolium subterraneum</i>                  | 78  | 3.6  | 0.2 | 18.0 |
|          | GEDI  | <i>Geranium dissectum</i>                      | 70  | 0.4  | 0.2 | 3.0  |
|          | AVBA  | <i>Avena barbata</i>                           | 65  | 9.4  | 0.2 | 68.0 |
|          | HOMAG | <i>Hordeum marinum</i> ssp. <i>gussonianum</i> | 65  | 3.0  | 0.2 | 18.0 |
|          | RUPU3 | <i>Rumex pulcher</i>                           | 65  | 0.9  | 0.1 | 3.0  |
|          | VUBR  | <i>Vulpia bromoides</i>                        | 61  | 1.4  | 0.2 | 3.0  |
|          | VISA  | <i>Vicia sativa</i>                            | 61  | 0.4  | 0.1 | 3.0  |
|          | TRDU2 | <i>Trifolium dubium</i>                        | 61  | 0.4  | 0.2 | 3.0  |
|          | BRDI3 | <i>Bromus diandrus</i>                         | 48  | 1.4  | 0.2 | 8.0  |
|          | PAVI3 | <i>Parentucellia viscosa</i>                   | 43  | 0.8  | 0.1 | 3.0  |

**STAND TABLE** continued

***Lolium perenne* Semi-Natural Alliance**

n = 23

| Lifeform | Code   | Botanical Name                                 | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     | BRMI2  | <i>Briza minor</i>                             | 43  | 0.5  | 0.1 | 3.0  |
|          | BETR   | <i>Bellardia trixago</i>                       | 39  | 1.1  | 0.1 | 3.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                      | 39  | 0.5  | 0.2 | 3.0  |
|          | HOMUL  | <i>Hordeum murinum</i> ssp. <i>leporinum</i>   | 35  | 12.3 | 0.2 | 68.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                      | 35  | 0.2  | 0.1 | 0.2  |
|          | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i> | 30  | 4.0  | 0.2 | 8.0  |
|          | DACA3  | <i>Danthonia californica</i>                   | 30  | 2.5  | 0.2 | 8.0  |
|          | SIGA   | <i>Silene gallica</i>                          | 30  | 0.2  | 0.2 | 0.2  |
|          | TACA8  | <i>Taeniatherum caput-medusae</i>              | 26  | 12.5 | 0.2 | 38.0 |
|          | CESO3  | <i>Centaurea solstitialis</i>                  | 26  | 11.2 | 0.2 | 38.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                     | 26  | 5.2  | 0.1 | 25.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                        | 26  | 1.0  | 0.2 | 5.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                    | 26  | 0.7  | 0.2 | 3.0  |
|          | BRELE  | <i>Brodiaea elegans</i> ssp. <i>elegans</i>    | 26  | 0.7  | 0.2 | 3.0  |
|          | ERBO   | <i>Erodium botrys</i>                          | 26  | 0.7  | 0.2 | 3.0  |
|          | LETA   | <i>Leontodon taraxacoides</i>                  | 26  | 0.7  | 0.2 | 3.0  |
|          | SIMA3  | <i>Silybum marianum</i>                        | 22  | 19.3 | 0.2 | 88.0 |
|          | HOB2   | <i>Hordeum brachyantherum</i>                  | 22  | 3.5  | 0.2 | 8.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                   | 22  | 1.3  | 0.1 | 3.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                    | 22  | 0.9  | 0.2 | 3.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                | 22  | 0.2  | 0.2 | 0.2  |
|          | RAMU2  | <i>Ranunculus muricatus</i>                    | 22  | 0.2  | 0.2 | 0.2  |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Lolium perenne* Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1), Coastal Hills-Santa Rosa Plain/263Aj (18), and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 72.0         | 50–100        | –          |
| <b>Herb</b>                          | 72.4         | 50–100        | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data**

**Aspect:** NE (4), NW (7), SE (3), SW (7)

**Macrotopography:** bottom (2), lower 1/3 of slope (4), middle 1/3 of slope (8), upper 1/3 of slope (5), upper 1/3 of slope to ridgetop (2)

**Microtopography:** concave (2), convex (5), flat (14)

**Parent material:** Franciscan melange (1), metasedimentary (5), sedimentary (11), volcanic (4)

**Soil texture:** clay or clay loam (18), silt or silt loam (1)

**Soil steepness:** flat/0° (3), gentle/1-5° (2), moderate/6-25° (16)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 311 ft. | 29–775 ft. |
| <b>Slope</b>             | 8.9°    | 0–25°      |
| <b>Large rock cover</b>  | 0.2%    | 0–2%       |
| <b>Small rock cover</b>  | 0.9%    | 0–5%       |
| <b>Bare ground cover</b> | 12.5%   | 0–72%      |
| <b>Litter cover</b>      | 67.4%   | 15–95%     |

**Samples Used to Describe Association (n=21)**

**Rapid Assessments:** none

**Relevés:** HEAD0050, HEAD0058, HEAD0061, HEAD0149, HEAD0161, HEAD0162, HEAD0247, HEAD0248, HEAD0249, HEAD0255, HEAD0342, HEAD0343, HEAD0345, HEAD0371, HEAD0384, HEAD0385, HEAD0414, HEAD0415, HEAD0416, SONO0748, SONO2202

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Lolium perenne* Semi-Natural Association**

n = 21

| Lifeform | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     | LOPE   | <i>Lolium perenne</i>                          | 100 | 53.9 | 10.0 | 88.0 |
|          | MEPO3  | <i>Medicago polymorpha</i>                     | 95  | 4.5  | 0.1  | 18.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                       | 81  | 7.6  | 0.2  | 18.0 |
|          | TRSU3  | <i>Trifolium subterraneum</i>                  | 76  | 3.8  | 0.2  | 18.0 |
|          | GEDI   | <i>Geranium dissectum</i>                      | 76  | 0.4  | 0.2  | 3.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i> | 71  | 3.0  | 0.2  | 18.0 |
|          | VISA   | <i>Vicia sativa</i>                            | 67  | 0.4  | 0.1  | 3.0  |
|          | AVBA   | <i>Avena barbata</i>                           | 62  | 10.2 | 0.2  | 68.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                        | 62  | 1.3  | 0.2  | 3.0  |
|          | RUPU3  | <i>Rumex pulcher</i>                           | 62  | 1.0  | 0.1  | 3.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                        | 62  | 0.4  | 0.2  | 3.0  |
|          | PAVI3  | <i>Parentucellia viscosa</i>                   | 48  | 0.8  | 0.1  | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                             | 48  | 0.5  | 0.1  | 3.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                         | 43  | 1.4  | 0.2  | 8.0  |
|          | BETR   | <i>Bellardia trixago</i>                       | 43  | 1.1  | 0.1  | 3.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                      | 38  | 0.6  | 0.2  | 3.0  |
|          | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i> | 33  | 4.0  | 0.2  | 8.0  |
|          | DACA3  | <i>Danthonia californica</i>                   | 33  | 2.5  | 0.2  | 8.0  |
|          | ANAR   | <i>Anagallis arvensis</i>                      | 33  | 0.2  | 0.1  | 0.2  |
|          | TACA8  | <i>Taeniatherum caput-medusae</i>              | 29  | 12.5 | 0.2  | 38.0 |
|          | CESO3  | <i>Centaurea solstitialis</i>                  | 29  | 11.2 | 0.2  | 38.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                     | 29  | 5.2  | 0.1  | 25.0 |
|          | HOMUL  | <i>Hordeum murinum</i> ssp. <i>leporinum</i>   | 29  | 3.7  | 0.2  | 8.0  |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Lolium perenne* Semi-Natural Association**

n = 21

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                       | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | NAPU4       | <i>Nassella pulchra</i>                     | 29         | 1.0        | 0.2        | 5.0        |
|                 | LETA        | <i>Leontodon taraxacoides</i>               | 29         | 0.7        | 0.2        | 3.0        |
|                 | BRELE       | <i>Brodiaea elegans</i> ssp. <i>elegans</i> | 29         | 0.7        | 0.2        | 3.0        |
|                 | ACMI2       | <i>Achillea millefolium</i>                 | 29         | 0.7        | 0.2        | 3.0        |
|                 | SIGA        | <i>Silene gallica</i>                       | 29         | 0.2        | 0.2        | 0.2        |
|                 | HOBR2       | <i>Hordeum brachyantherum</i>               | 24         | 3.5        | 0.2        | 8.0        |
|                 | CAPY2       | <i>Carduus pycnocephalus</i>                | 24         | 1.3        | 0.1        | 3.0        |
|                 | ERBO        | <i>Erodium botrys</i>                       | 24         | 0.8        | 0.2        | 3.0        |
|                 | CHPO3       | <i>Chlorogalum pomeridianum</i>             | 24         | 0.2        | 0.2        | 0.2        |
|                 | RAMU2       | <i>Ranunculus muricatus</i>                 | 24         | 0.2        | 0.2        | 0.2        |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

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***Ludwigia (hexapetala, peploides)* Provisional Semi-Natural Alliance**  
**Water primrose wetlands**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Ludwigia hexapetala*, *Ludwigia peploides* ssp. *montevidensis* or other *Ludwigia* species are dominant as emergent or floating plants on the water surface. *Azolla* spp., algae, *Sparganium*, *Polygonum* spp. and other hydrophytic plants are often present.

Plants create dense mats in shallow water and over wet soil, occurring alone or with natives such as *Azolla filiculoides*, *Hydrocotyle ranunculoides*, and *Schoenoplectus acutus*. These plants clog river waterways, lakes, irrigation canals, and agricultural wetland areas, and the mats threaten agriculture and federal water delivery projects. *Ludwigia* species compete with native plants, eliminate open water habitat, and reduce oxygen levels critical for fish survival. The mats also pose a public health threat as a habitat for mosquitoes that carry West Nile virus (Sears et al. 2005). Efforts to remove dense, spreading stands of *Ludwigia hexapetala* are underway, especially in the Russian River watershed, through a *Ludwigia* Task Force (Sears et al. 2005, 2006).

Sonoma County

*Ludwigia (hexapetala, peploides)* stands are associated with permanent fresh water ponds scattered about the county. One of the largest stands ever sampled anywhere of this alliance occurs at the Laguna de Santa Rosa between Graton and Santa Rosa.

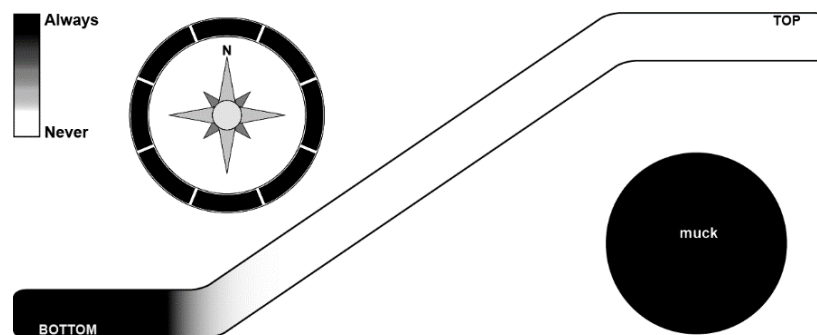
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**Local Alliance Summary (n = 3)**

**Elevation:** 60–1262 ft, mean 475 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 83.3         | 75–95         | –          |
| <b>Herb</b>                          | 83.3         | 75–95         | 0.5–2      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0–0°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 0.0%  | 0–0%  |
| <b>Bare ground cover</b> | 18.3% | 0–55% |
| <b>Litter cover</b>      | 33.0% | 0–97% |

**Associations within this Alliance:**

*Ludwigia (hexapetala, peploides)* Provisional Semi-Natural Association

**STAND TABLE**

***Ludwigia (hexapetala, peploides)* Provisional Semi-Natural Alliance**

n = 3

| Lifeform            | Code   | Botanical Name                   | Con | Avg  | Min  | Max  |
|---------------------|--------|----------------------------------|-----|------|------|------|
| <b>Herb</b>         |        |                                  |     |      |      |      |
|                     | LUDWI  | <i>Ludwigia</i>                  | 33  | 60.0 | 60.0 | 60.0 |
|                     | SPEU   | <i>Sparganium eurycarpum</i>     | 33  | 21.0 | 21.0 | 21.0 |
|                     | AZFI   | <i>Azolla filiculoides</i>       | 33  | 5.0  | 5.0  | 5.0  |
|                     | LEMNA  | <i>Lemna</i>                     | 33  | 0.2  | 0.2  | 0.2  |
|                     | POLYG4 | <i>Polygonum</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|                     | POHY2  | <i>Polygonum hydropiperoides</i> | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |                                  |     |      |      |      |
|                     | 2ALGA  | Alga                             | 33  | 15.0 | 15.0 | 15.0 |

***Ludwigia (hexapetala, peploides)* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) and Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 83.3         | 75–95         | –          |
| <b>Herb</b>                          | 83.3         | 75–95         | 0.5–2      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** flat (3)

**Macrotopography:** bottom (3)

**Microtopography:** concave (1), flat (2)

**Parent material:** metasedimentary (1), sedimentary (1), silty alluvium (1)

**Soil texture:** muck (3)

**Slope steepness:** flat/0° (3)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 475 ft. | 60–1262 ft. |
| <b>Slope</b>             | 0.0°    | 0–0°        |
| <b>Large rock cover</b>  | 0.0%    | 0–0%        |
| <b>Small rock cover</b>  | 0.0%    | 0–0%        |
| <b>Bare ground cover</b> | 18.3%   | 0–55%       |
| <b>Litter cover</b>      | 33.0%   | 0–97%       |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0276, SONO0325

**Relevés:** SONO0501

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Ludwigia (hexapetala, peploides)* Provisional Semi-Natural Association**

n = 3

| Lifeform            | Code   | Botanical Name                   | Con | Avg  | Min  | Max  |
|---------------------|--------|----------------------------------|-----|------|------|------|
| <b>Herb</b>         |        |                                  |     |      |      |      |
|                     | LUDWI  | <i>Ludwigia</i>                  | 33  | 60.0 | 60.0 | 60.0 |
|                     | SPEU   | <i>Sparganium eurycarpum</i>     | 33  | 21.0 | 21.0 | 21.0 |
|                     | AZFI   | <i>Azolla filiculoides</i>       | 33  | 5.0  | 5.0  | 5.0  |
|                     | LEMNA  | <i>Lemna</i>                     | 33  | 0.2  | 0.2  | 0.2  |
|                     | POLYG4 | <i>Polygonum</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|                     | POHY2  | <i>Polygonum hydropiperoides</i> | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |                                  |     |      |      |      |
|                     | 2ALGA  | Alga                             | 33  | 15.0 | 15.0 | 15.0 |



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**Mesembryanthemum spp. – Carpobrotus spp. Provisional Semi-Natural Alliance**  
**Ice plant – sea fig draperies**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Carpobrotus chilensis*, *C. edulis*, *Mesembryanthemum*, or other ice plant taxa are dominant in the herbaceous layer. At least eight invasive ice plant taxa grow in California: *Aptenia cordifolia*, *Carpobrotus edulis*, *C. chilensis*, *Conicosia pugioniformis*, *Drosanthemum floribundum*, *Malephora crocea*, *Mesembryanthemum crystallinum*, and *M. nodiflorum*.

*Carpobrotus edulis* is a ground-hugging succulent perennial that forms impenetrable mats covering large areas. This ice plant has been widely planted for soil stabilization and landscaping. The success of *C. edulis* is due particularly to its tolerance of a wide range of soil moisture and nutrient conditions, and to its dispersal by mammals (D'Antonio 1993). This species is often confused with *C. chilensis*, a smaller, less aggressive ice plant with magenta flowers. The two species hybridize, and the hybrids are invasive as well.

*Aptenia cordifolia* grows in disturbed places and on the margins of coastal wetlands (Kitz 2000a). *Conicosia pugioniformis*, a short-lived succulent, has narrow leaves and does not form clonal mats. It is most abundant in open patches on dunes and in recently disturbed areas (Albert and D'Antonio 2000). The uncommon *Drosanthemum floribundum* is a mat-forming shrub. *Malephora crocea* is a prostrate shrub with linear leaves, common in coastal southern California (DiTomaso and Healy 2007). *Mesembryanthemum crystallinum* and *M. nodiflorum* invade coastal bluffs and interior alkaline wetlands in southern California (Randall 2000).

Sonoma County

Mats of *Carpobrotus edulis* or *C. chilensis* are scattered along coastal bluffs in the county. A single sample was taken at Bodega Head, but stands near Fort Ross and Salt Point State Parks have been observed.

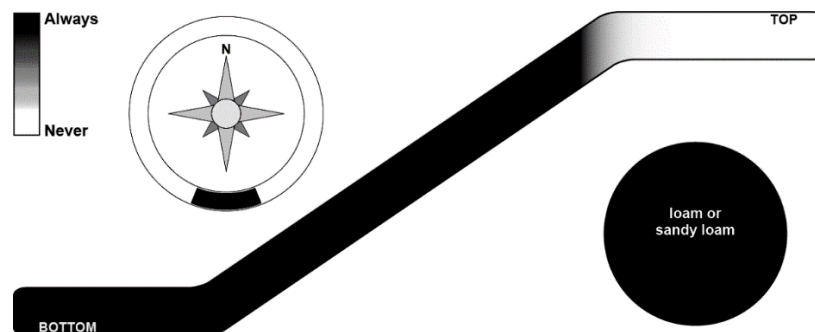
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**Local Alliance Summary (n = 1)**

**Elevation:** 124 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 58.0         | 58            | –          |
| <b>Herb</b>                          | 55.0         | 55            | <0.5–0.5   |
| <b>Shrub</b>                         | 5.0          | 5             | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 45.0° | 45°   |
| <b>Large rock cover</b>  | 35.2% | 35.2% |
| <b>Small rock cover</b>  | 25.2% | 25.2% |
| <b>Bare ground cover</b> | 27.0% | 27%   |
| <b>Litter cover</b>      | 10.0% | 10%   |

**Associations within this Alliance:**

*Carpobrotus (edulis)* Provisional Semi-Natural Association

**STAND TABLE**

***Mesembryanthemum* spp. – *Carpobrotus* spp. Provisional Semi-Natural Alliance**

n = 1

| Lifeform | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | LUAR   | <i>Lupinus arboreus</i>                          | 100 | 3.0  | 3.0  | 3.0  |
|          | BAPI   | <i>Baccharis pilularis</i>                       | 100 | 0.2  | 0.2  | 0.2  |
| Herb     | CARPO  | <i>Carpobrotus</i>                               | 100 | 52.0 | 52.0 | 52.0 |
|          | ERLA5  | <i>Eriogonum latifolium</i>                      | 100 | 3.0  | 3.0  | 3.0  |
|          | AMCH4  | <i>Ambrosia chamissonis</i>                      | 100 | 2.0  | 2.0  | 2.0  |
|          | ACMI2  | <i>Achillea millefolium</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|          | AMAR4  | <i>Ammophila arenaria</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | ANHE   | <i>Angelica hendersonii</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|          | ARMAC2 | <i>Armeria maritima</i> ssp. <i>californica</i>  | 100 | 0.2  | 0.2  | 0.2  |
|          | BRMA   | <i>Briza maxima</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|          | BRMA3  | <i>Bromus madritensis</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|          | DUFA   | <i>Dudleya farinosa</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|          | ERST9  | <i>Eriophyllum stoechadifolium</i>               | 100 | 0.2  | 0.2  | 0.2  |
|          | GRSTP2 | <i>Grindelia stricta</i> var. <i>platyphylla</i> | 100 | 0.2  | 0.2  | 0.2  |

***Carpobrotus (edulis)* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 58.0         | 58            | –          |
| <b>Herb</b>                          | 55.0         | 55            | <0.5–0.5   |
| <b>Shrub</b>                         | 5.0          | 5             | 1–2        |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** variable (1)  
**Macrotopography:** bottom to upper 1/3 of slope (1)  
**Microtopography:** undulating (1)  
**Parent material:** Franciscan melange (1)  
**Soil texture:** loam or sandy loam (1)  
**Slope steepness:** steep/>25° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 124 ft. | 124 ft. |
| <b>Slope</b>             | 45.0°   | 45°     |
| <b>Large rock cover</b>  | 35.2%   | 35.2%   |
| <b>Small rock cover</b>  | 25.2%   | 25.2%   |
| <b>Bare ground cover</b> | 27.0%   | 27%     |
| <b>Litter cover</b>      | 10.0%   | 10%     |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0103  
**Relevés:** none

**SCV Global/State Rank:** Not ranked – semi-natural association.

**STAND TABLE**

***Carpobrotus (edulis)* Provisional Semi-Natural Association**

n = 1

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Shrub</b> | LUAR   | <i>Lupinus arboreus</i>                          | 100 | 3.0  | 3.0  | 3.0  |
|              | BAPI   | <i>Baccharis pilularis</i>                       | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  | CARPO  | <i>Carpobrotus</i>                               | 100 | 52.0 | 52.0 | 52.0 |
|              | ERLA5  | <i>Eriogonum latifolium</i>                      | 100 | 3.0  | 3.0  | 3.0  |
|              | AMCH4  | <i>Ambrosia chamissonis</i>                      | 100 | 2.0  | 2.0  | 2.0  |
|              | DUFA   | <i>Dudleya farinosa</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|              | ANHE   | <i>Angelica hendersonii</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|              | ANAR   | <i>Anagallis arvensis</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|              | AMAR4  | <i>Ammophila arenaria</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|              | ERST9  | <i>Eriophyllum stoechadifolium</i>               | 100 | 0.2  | 0.2  | 0.2  |
|              | BRMA   | <i>Briza maxima</i>                              | 100 | 0.2  | 0.2  | 0.2  |
|              | ACMI2  | <i>Achillea millefolium</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|              | BRMA3  | <i>Bromus madritensis</i>                        | 100 | 0.2  | 0.2  | 0.2  |
|              | GRSTP2 | <i>Grindelia stricta</i> var. <i>platyphylla</i> | 100 | 0.2  | 0.2  | 0.2  |
|              | ARMAC2 | <i>Armeria maritima</i> ssp. <i>californica</i>  | 100 | 0.2  | 0.2  | 0.2  |

**Mimulus (guttatus) Alliance**  
**Common monkey flower seeps**

Statewide (Sawyer et al. 2009)

*Mimulus guttatus*, *Mimulus lewisii*, *Mimulus moschatus*, *Mimulus pilosus*, or other wetland *Mimulus* species is dominant or characteristically present in the herbaceous layer with *Bromus diandrus*, *Bromus hordeaceus*, *Carex* spp., *Equisetum arvense*, *Juncus* spp., *Lactuca serriola*, *Lotus purshianus*, *Melilotus indicus*, *Pentagramma triangularis*, *Poa tenerrima*, *Rumex crispus*, *Sonchus asper*, *Stachys albens*, *Trifolium microcephalum*, *Triteleia hyacinthina*, and *Vulpia microstachys*. Emergent shrubs may be present at low cover, including *Baccharis salicifolia* or *Ceanothus cuneatus*.

The *Mimulus (guttatus)* Alliance often forms stands within the splash zone of small first-order streams, seeps, springs, and hanging gardens. Stands often occur as small patches or in narrow linear strips, occasionally broadening into small hollows. Some stands are found on very steep cascades and waterfalls, or along gentle streams. The floristic composition of stands is variable. As currently understood, the alliance includes stands with *Mimulus guttatus*, *M. lewisii*, *M. moschatus*, or *M. pilosus* characteristically present. Stands sometimes occur in mesic upland areas that quickly dry by mid to late spring; they are not usually on flats or in swales, unlike stands of the vernal pool alliances.

Sonoma County

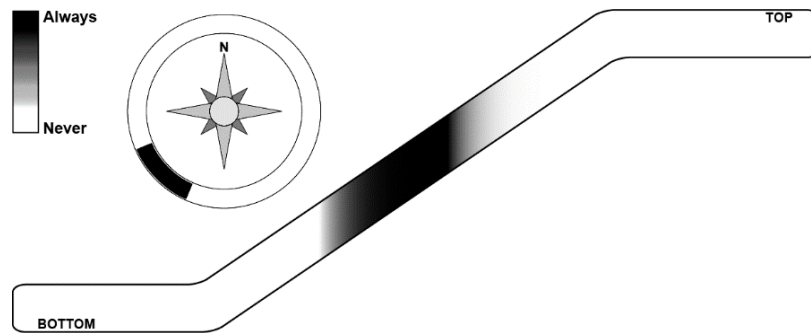
*Mimulus (guttatus)* stands are small and visibly distinct for relatively short periods in the spring months. The stands sampled so far in the county are associated with vernal seeps and rivulets in areas of rock outcrops or rocky ravines. Stands may occur on or off serpentine.

**Local Alliance Summary (n = 2)**

**Elevation:** 649–1076 ft, mean 863 ft

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                  | Mean % Cover | Range % Cover | Height (m) |
|------------------|--------------|---------------|------------|
| Total vegetation | 62.5         | 45–80         | –          |
| Herb             | 62.5         | 45–80         | <0.5–0.5   |
| Shrub            | 0.0          | 0–0           | –          |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 25.0° | 6–44°  |
| Large rock cover  | 31.0% | 0–62%  |
| Small rock cover  | 9.1%  | 0–18%  |
| Bare ground cover | 58.0% | 19–97% |
| Litter cover      | 1.0%  | 1–1%   |

**Associations within this Alliance:**

*Mimulus guttatus* Association

**STAND TABLE**

***Mimulus (guttatus)* Alliance**

n = 2

| Lifeform     | Code  | Botanical Name                  | Con | Avg  | Min  | Max  |
|--------------|-------|---------------------------------|-----|------|------|------|
| Herb         |       |                                 |     |      |      |      |
|              | MIGU  | <i>Mimulus guttatus</i>         | 100 | 47.5 | 45.0 | 50.0 |
|              | LOPE  | <i>Lolium perenne</i>           | 50  | 18.0 | 18.0 | 18.0 |
|              | JUBU  | <i>Juncus bufonius</i>          | 50  | 15.0 | 15.0 | 15.0 |
|              | LASE  | <i>Lactuca serriola</i>         | 50  | 2.0  | 2.0  | 2.0  |
|              | LOHU2 | <i>Lotus humistratus</i>        | 50  | 2.0  | 2.0  | 2.0  |
|              | ELMU3 | <i>Elymus multisetus</i>        | 50  | 1.0  | 1.0  | 1.0  |
|              | PLER3 | <i>Plantago erecta</i>          | 50  | 1.0  | 1.0  | 1.0  |
|              | SCBO  | <i>Scribneria bolanderi</i>     | 50  | 1.0  | 1.0  | 1.0  |
|              | ESCA2 | <i>Eschscholzia californica</i> | 50  | 0.2  | 0.2  | 0.2  |
|              | PLANT | <i>Plantago</i>                 | 50  | 0.2  | 0.2  | 0.2  |
| Non-vascular |       |                                 |     |      |      |      |
|              | 2MOSS | Moss                            | 50  | 35.0 | 35.0 | 35.0 |

***Mimulus guttatus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 62.5         | 45–80         | –          |
| Herb                          | 62.5         | 45–80         | <0.5–0.5   |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data**

**Aspect:** SW (2)

**Macrotopography:** middle 1/3 of slope (2)

**Microtopography:** concave (1), undulating (1)

**Parent material:** Franciscan melange (1), serpentine (1)

**Soil texture:** no data

**Slope steepness:** moderate/6-25° (1), steep/>25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 863 ft. | 649–1076 ft. |
| <b>Slope</b>             | 25.0°   | 6–44°        |
| <b>Large rock cover</b>  | 31.0%   | 0–62%        |
| <b>Small rock cover</b>  | 9.1%    | 0–18%        |
| <b>Bare ground cover</b> | 58.0%   | 19–97%       |
| <b>Litter cover</b>      | 1.0%    | 1–1%         |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0347, SONO2204

**Relevés:** none

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Mimulus guttatus* Association**

n = 2

| Lifeform            | Code  | Botanical Name                  | Con | Avg  | Min  | Max  |
|---------------------|-------|---------------------------------|-----|------|------|------|
| <b>Herb</b>         |       |                                 |     |      |      |      |
|                     | MIGU  | <i>Mimulus guttatus</i>         | 100 | 47.5 | 45.0 | 50.0 |
|                     | LOPE  | <i>Lolium perenne</i>           | 50  | 18.0 | 18.0 | 18.0 |
|                     | JUBU  | <i>Juncus bufonius</i>          | 50  | 15.0 | 15.0 | 15.0 |
|                     | LOHU2 | <i>Lotus humistratus</i>        | 50  | 2.0  | 2.0  | 2.0  |
|                     | LASE  | <i>Lactuca serriola</i>         | 50  | 2.0  | 2.0  | 2.0  |
|                     | SCBO  | <i>Scribneria bolanderi</i>     | 50  | 1.0  | 1.0  | 1.0  |
|                     | PLER3 | <i>Plantago erecta</i>          | 50  | 1.0  | 1.0  | 1.0  |
|                     | ELMU3 | <i>Elymus multisetus</i>        | 50  | 1.0  | 1.0  | 1.0  |
|                     | PLANT | <i>Plantago</i>                 | 50  | 0.2  | 0.2  | 0.2  |
|                     | ESCA2 | <i>Eschscholzia californica</i> | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |       |                                 |     |      |      |      |
|                     | 2MOSS | Moss                            | 50  | 35.0 | 35.0 | 35.0 |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Nassella* spp. – *Melica* spp. Provisional Alliance**  
**Needlegrass – Melic grass grassland**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Melica californica*, *M. torreyana*, *Nassella cernua*, *N. lepida*, and/or *N. pulchra* dominate in the herbaceous layer with *Aristida ternipes*, *Avena* spp., *Bromus* spp., *Calochortus* spp., *Calamagrostis koelerioides*, *Calystegia* spp., *Chlorogalum pomeridianum*, *Clarkia* spp., *Croton setigerus*, *Cryptantha* spp., *Daucus pusillus*, *Dichelostemma capitatum*, *Elymus* spp., *Eriogonum* spp., *Erodium* spp., *Eschscholzia californica*, *Festuca californica*, *Hirschfeldia incana*, *Holocarpha virgata*, *Hordeum brachyantherum*, *Koeleria macrantha*, *Lasthenia* spp., *Lepidium nitidum*, *Leymus triticoides*, *Lolium perenne*, *Lupinus* spp., *Plantago* spp., *Poa secunda*, *Sanicula* spp., *Sisyrinchium bellum*, *Trifolium* spp., and *Vulpia* spp. Emergent trees and shrubs may be present at low cover.

*Nassella cernua* stands commonly appear in the transition between coastal/valley grasslands and inland/desert steppes. For example, *N. cernua* and *Achnatherum speciosum* replace *N. pulchra* and *Leymus triticoides* in the transition between the eastern desert slopes of southern California mountains and the valley grasslands (Bartolome et al. 2007a).

In southern California, *Nassella lepida* is a common understory herb on dry, fine-textured soils in stands of the *Artemisia californica* and *Salvia leucophylla* Alliances. In some areas, such as the Santa Monica Mountains, small (< 1 ha) glades dominated by this species occur with a diverse mixture of native plants.

*Nassella pulchra* stands commonly exist in deep and clay-rich soils, but they also occur in sterile serpentine soils (Evens and San 2004, Gelbard and Harrison 2003, Hamilton 1997, Harrison and Viers 2007, McNaughton 1968) or in shallow soils of coastal hills in central and southern California (Keeler-Wolf et al. 2003a). Coastal stands currently occur from Baja, California and San Diego County northward across the Coast Ranges to Sonoma County (Bartolome et al. 2007a), and these stands tend to have more emergent shrubs, suggesting seral relationships with woody vegetation types (Tyler et al. 2007).

*Melica torreyana* is endemic to California, typically occurring under a canopy of chaparral and forests. At times, it dominates in open habitats where the plants form loose tufts of culms forming localized stands in grasslands or meadows. *Melica torreyana* stands appear to occur both on and off serpentine substrates.

Southern California populations of *Nassella cernua* have distinctly shorter awns than those of the central and southern Coast Ranges, and have previously been mistaken for *Nassella pulchra*. This is part of the reason that the diagnostic species of the alliance includes the three *Nassella* species. *Melica imperfecta* and *M. stricta* have not been observed to form stands; both tend to occur in drier, rockier areas and are often components of other alliances.

Sonoma County

Most stands in the county are characterized by *Nassella pulchra* and/or *Melica californica*. *Nassella pulchra* stands range from mesic coastal associations with *Plantago lanceolata* to serpentine stands with *Plantago erecta* and lower montane stands with *Achnatherum lemmonii*. Stands of *Nassella* mixed with *Melica californica* occur in mesic sites throughout the county. They tend to be dominated by *Melica californica* on north-facing slopes, but co-dominated by *Nassella pulchra* and *Melica californica* on slopes with more neutral aspects.

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**Local Alliance Summary (n = 40)**

**Elevation:** 137–2292 ft, mean 761 ft

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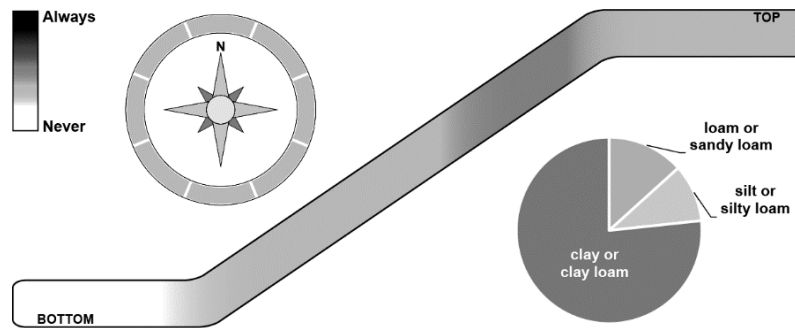
<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**Noteworthy Taxa**

- Gilia capitata* ssp. *tomentosa*  
CA rare plant rank: 1B.1  
NatureServe global/state rank: G5T2/S2
- Hemizonia congesta* ssp. *congesta*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G5T1T2/S1S2
- Hesperervax sparsiflora* var. *brevifolia*  
CA rare plant rank: 1B.2  
NatureServe global/state rank: G4T3/S2

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 48.3         | 20–90         | –          |
| <b>Herb</b>                          | 49.9         | 20–90         | <0.5–1     |
| <b>Shrub</b>                         | 0.3          | 0–4           | <0.5–1     |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0.2         | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 14.5° | 0–37° |
| <b>Large rock cover</b>  | 6.2%  | 0–30% |
| <b>Small rock cover</b>  | 8.9%  | 0–74% |
| <b>Bare ground cover</b> | 17.2% | 0–85% |
| <b>Litter cover</b>      | 50.2% | 2–97% |

**Associations within this Alliance:**

- Melica californica* Provisional Association
- Nassella pulchra* – *Achnatherum lemmonii* Provisional Association
- Nassella pulchra* – *Avena* spp. – *Bromus* spp. Association
- Nassella pulchra* – *Hemizonia congesta* Provisional Association

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Associations within this Alliance, continued:**

*Nassella pulchra* – *Lolium perenne* – *Plantago erecta* Serpentine Provisional Association  
*Nassella pulchra* – *Melica californica* – Annual Grass Association  
*Nassella pulchra* – *Plantago lanceolata* Provisional Association  
*Nassella pulchra* Association

**STAND TABLE**

***Nassella* spp. – *Melica* spp. Provisional Alliance**

n = 40

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     |        |  |     |      |     |      |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 95  | 13.3 | 0.2 | 38.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 85  | 4.6  | 0.2 | 38.0 |
|          | LOPE   | <i>Lolium perenne</i>                                | 70  | 11.1 | 0.2 | 38.0 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 55  | 2.5  | 0.2 | 18.0 |
|          | AVBA   | <i>Avena barbata</i>                                 | 50  | 4.0  | 0.2 | 18.0 |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 40  | 3.8  | 0.2 | 18.0 |
|          | PLER3  | <i>Plantago erecta</i>                               | 40  | 2.8  | 0.2 | 18.0 |
|          | VUBR   | <i>Vulpia bromoides</i>                              | 38  | 7.0  | 0.2 | 38.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                            | 38  | 0.7  | 0.2 | 8.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                          | 35  | 4.6  | 0.2 | 38.0 |
|          | SABI3  | <i>Sanicula bipinnatifida</i>                        | 35  | 0.6  | 0.1 | 4.0  |
|          | CYEC   | <i>Cynosurus echinatus</i>                           | 33  | 2.2  | 0.2 | 18.0 |
|          | DACA3  | <i>Danthonia californica</i>                         | 30  | 3.3  | 0.2 | 10.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                               | 30  | 2.6  | 0.2 | 8.0  |
|          | DAPU3  | <i>Daucus pusillus</i>                               | 30  | 1.0  | 0.2 | 3.0  |
|          | LASA   | <i>Lactuca saligna</i>                               | 30  | 0.7  | 0.2 | 3.0  |
|          | LOWR2  | <i>Lotus wrangelianus</i>                            | 30  | 0.6  | 0.1 | 5.0  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 30  | 0.3  | 0.1 | 1.0  |
|          | PLLA   | <i>Plantago lanceolata</i>                           | 28  | 9.7  | 0.2 | 38.0 |
|          | LACA7  | <i>Lasthenia californica</i>                         | 28  | 5.4  | 0.2 | 38.0 |
|          | ACMI2  | <i>Achillea millefolium</i>                          | 28  | 1.0  | 0.2 | 3.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                           | 28  | 0.5  | 0.2 | 3.0  |
|          | SIGA   | <i>Silene gallica</i>                                | 28  | 0.2  | 0.1 | 0.2  |
|          | NALE2  | <i>Nassella lepida</i>                               | 25  | 4.9  | 0.2 | 18.0 |
|          | AICA   | <i>Aira caryophyllea</i>                             | 25  | 1.0  | 0.2 | 3.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>       | 23  | 2.5  | 0.2 | 8.0  |
|          | KOMA   | <i>Koeleria macrantha</i>                            | 23  | 1.7  | 0.1 | 3.0  |
|          | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i>  | 23  | 1.7  | 0.2 | 8.0  |
|          | ELMU3  | <i>Elymus multisetus</i>                             | 23  | 1.7  | 0.2 | 8.0  |
|          | TRLA16 | <i>Triteleia laxa</i>                                | 23  | 1.4  | 0.2 | 3.0  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>    | 23  | 0.8  | 0.1 | 3.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 23  | 0.6  | 0.1 | 3.0  |
|          | BRMI2  | <i>Briza minor</i>                                   | 23  | 0.5  | 0.1 | 3.0  |
|          | BRMA   | <i>Briza maxima</i>                                  | 20  | 15.4 | 0.2 | 38.0 |
|          | ERBO   | <i>Erodium botrys</i>                                | 20  | 2.3  | 0.2 | 8.0  |
|          | LIBI5  | <i>Linum bienne</i>                                  | 20  | 1.5  | 0.2 | 8.0  |
|          | MECA2  | <i>Melica californica</i>                            | 20  | 0.9  | 0.1 | 3.0  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                         | 20  | 0.2  | 0.1 | 0.2  |

**Noteworthy Taxa**

- Gilia capitata* ssp. *tomentosa*  
CA rare plant rank: 1B.1  
NatureServe Global/State rank: G5T2/S2
- Hemizonia congesta* ssp. *congesta*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G5T1T2/S1S2
- Hesperervax sparsiflora* var. *brevifolia*  
CA rare plant rank: 1B.2  
NatureServe Global/State rank: G4T3/S2

**Melica californica Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 23.0         | 23            | –          |
| <b>Herb</b>                          | 23.0         | 23            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

- Aspect:** NE (1)
- Macrotopography:** lower 1/3 of slope (1)
- Microtopography:** flat (1)
- Parent material:** sedimentary (1)
- Soil texture:** no data
- Slope steepness:** gentle/1-5° (1)

|                          | Mean    | Range   |
|--------------------------|---------|---------|
| <b>Elevation</b>         | 516 ft. | 516 ft. |
| <b>Slope</b>             | 4.0°    | 4°      |
| <b>Large rock cover</b>  | 2.0%    | 2%      |
| <b>Small rock cover</b>  | 74.0%   | 74%     |
| <b>Bare ground cover</b> | 12.0%   | 12%     |
| <b>Litter cover</b>      | 10.0%   | 10%     |

**Samples Used to Describe Association (n=1)**

- Rapid Assessments:** none
- Relevés:** SONO0359

**SCV Global/State Rank:** G3?/S3?<sup>1</sup>

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE**

***Melica californica* Provisional Association**

n = 1

| Lifeform                               | Code   | Botanical Name                                       | Con | Avg | Min | Max |
|--|--------|--|-----|-----|-----|-----|
| <b>Regenerating or Understory Tree</b> |        |  |     |     |     |     |
|  | QUAG   | <i>Quercus agrifolia</i>                             | 100 | 0.2 | 0.2 | 0.2 |
| <b>Herb</b>                            |        |  |     |     |     |     |
|  | PEKE   | <i>Perideridia kelloggii</i>                         | 100 | 7.0 | 7.0 | 7.0 |
|  | CHLOR3 | <i>Chlorogalum</i>                                   | 100 | 7.0 | 7.0 | 7.0 |
|  | LOUT   | <i>Lomatium utriculatum</i>                          | 100 | 4.0 | 4.0 | 4.0 |
|  | CYNOS2 | <i>Cynosurus</i>                                     | 100 | 4.0 | 4.0 | 4.0 |
|  | MECA2  | <i>Melica californica</i>                            | 100 | 2.0 | 2.0 | 2.0 |
|  | RAOC   | <i>Ranunculus occidentalis</i>                       | 100 | 1.0 | 1.0 | 1.0 |
|  | SABI3  | <i>Sanicula bipinnatifida</i>                        | 100 | 1.0 | 1.0 | 1.0 |
|  | VISA   | <i>Vicia sativa</i>                                  | 100 | 1.0 | 1.0 | 1.0 |
|  | AVENA  | <i>Avena</i>   | 100 | 0.2 | 0.2 | 0.2 |
|  | TRWI3  | <i>Trifolium willdenovii</i>                         | 100 | 0.2 | 0.2 | 0.2 |
|  | PLCO4  | <i>Plectritis congesta</i>                           | 100 | 0.2 | 0.2 | 0.2 |
|  | CLARK  | <i>Clarkia</i>                                       | 100 | 0.2 | 0.2 | 0.2 |
|  | CEGL2  | <i>Cerastium glomeratum</i>                          | 100 | 0.2 | 0.2 | 0.2 |
|  | CATU3  | <i>Carex tumulicola</i>                              | 100 | 0.2 | 0.2 | 0.2 |
|  | BRHO2  | <i>Bromus hordeaceus</i>                             | 100 | 0.2 | 0.2 | 0.2 |
|  | ACMI2  | <i>Achillea millefolium</i>                          | 100 | 0.2 | 0.2 | 0.2 |
|  | CRSE11 | <i>Croton setigerus</i>                              | 100 | 0.2 | 0.2 | 0.2 |
|  | LITHO2 | <i>Lithophragma</i>                                  | 100 | 0.2 | 0.2 | 0.2 |
|  | NEMEM  | <i>Nemophila menziesii</i> var. <i>menziesii</i>     | 100 | 0.2 | 0.2 | 0.2 |
|  | LUBI   | <i>Lupinus bicolor</i>                               | 100 | 0.2 | 0.2 | 0.2 |
|  | CACO35 | <i>Calystegia collina</i>                            | 100 | 0.2 | 0.2 | 0.2 |
|  | SIBE   | <i>Sisyrinchium bellum</i>                           | 100 | 0.2 | 0.2 | 0.2 |
|  | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 100 | 0.2 | 0.2 | 0.2 |
|  | LEPA51 | <i>Leptosiphon parviflorus</i>                       | 100 | 0.2 | 0.2 | 0.2 |
|  | IRMA   | <i>Iris macrosiphon</i>                              | 100 | 0.2 | 0.2 | 0.2 |
|  | GAPA5  | <i>Galium parisiense</i>                             | 100 | 0.2 | 0.2 | 0.2 |
|  | ELGL   | <i>Elymus glaucus</i>                                | 100 | 0.2 | 0.2 | 0.2 |

***Nassella pulchra* – *Achnatherum lemmonii* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 85.0         | 80–90         | –          |
| <b>Herb</b>                          | 85.0         | 80–90         | –          |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Summary of Environmental Data**

**Aspect:** SW (2)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1)

**Microtopography:** convex (1), flat (1)

**Parent material:** mixed rock (1), sedimentary (1)

**Soil texture:** clay or clay loam (1), silt or silt loam (1)

**Slope steepness:** moderate/6-25° (2)

|                          | Mean    | Range       |
|--------------------------|---------|-------------|
| <b>Elevation</b>         | 326 ft. | 320–332 ft. |
| <b>Slope</b>             | 14.0°   | 12–16°      |
| <b>Large rock cover</b>  | 0.0%    | 0–0%        |
| <b>Small rock cover</b>  | 0.5%    | 0–1%        |
| <b>Bare ground cover</b> | 2.5%    | 1–4%        |
| <b>Litter cover</b>      | 84.5%   | 84–85%      |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none

**Relevés:** HEAD0297, HEAD0410

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Nassella pulchra* – *Achnatherum lemmonii* Provisional Association**

n = 2

| Lifeform                               | Code   | Botanical Name                | Con | Avg  | Min  | Max  |
|--|--------|-------------------------------|-----|------|------|------|
| <b>Regenerating or Understory Tree</b> | PSME   | <i>Pseudotsuga menziesii</i>  | 50  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            | ACLE8  | <i>Achnatherum lemmonii</i>   | 100 | 38.0 | 8.0  | 68.0 |
|  | VUBR   | <i>Vulpia bromoides</i>       | 100 | 8.0  | 8.0  | 8.0  |
|  | HYRA3  | <i>Hypochaeris radicata</i>   | 100 | 5.5  | 3.0  | 8.0  |
|  | NAPU4  | <i>Nassella pulchra</i>       | 100 | 4.1  | 0.2  | 8.0  |
|  | LITR4  | <i>Linum trigynum</i>         | 100 | 3.0  | 3.0  | 3.0  |
|  | AICA   | <i>Aira caryophyllea</i>      | 100 | 3.0  | 3.0  | 3.0  |
|  | BRHO2  | <i>Bromus hordeaceus</i>      | 100 | 1.6  | 0.2  | 3.0  |
|  | CYEC   | <i>Cynosurus echinatus</i>    | 100 | 1.6  | 0.2  | 3.0  |
|  | 2DAPI  | <i>Danthonia pilosa</i>       | 100 | 1.6  | 0.2  | 3.0  |
|  | AVBA   | <i>Avena barbata</i>          | 100 | 1.6  | 0.2  | 3.0  |
|  | LIBI5  | <i>Linum bienne</i>           | 100 | 0.2  | 0.2  | 0.2  |
|  | RUAC3  | <i>Rumex acetosella</i>       | 100 | 0.2  | 0.2  | 0.2  |
|  | PLLA   | <i>Plantago lanceolata</i>    | 100 | 0.2  | 0.2  | 0.2  |
|  | ANAR   | <i>Anagallis arvensis</i>     | 100 | 0.2  | 0.2  | 0.2  |
|  | GAPH2  | <i>Gastrium phleoides</i>     | 50  | 18.0 | 18.0 | 18.0 |
|  | ERGL11 | <i>Erechtites glomeratus</i>  | 50  | 8.0  | 8.0  | 8.0  |
|  | GAAP2  | <i>Galium aparine</i>         | 50  | 3.0  | 3.0  | 3.0  |
|  | HOLA   | <i>Holcus lanatus</i>         | 50  | 3.0  | 3.0  | 3.0  |
|  | LETA   | <i>Leontodon taraxacoides</i> | 50  | 3.0  | 3.0  | 3.0  |
|  | NALE2  | <i>Nassella lepida</i>        | 50  | 3.0  | 3.0  | 3.0  |
|  | TRMA2  | <i>Trifolium macraei</i>      | 50  | 3.0  | 3.0  | 3.0  |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Nassella pulchra* – *Achnatherum lemmonii* Provisional Association**

n = 2

| Lifeform | Code  | Botanical Name                | Con | Avg | Min | Max |
|----------|-------|-------------------------------|-----|-----|-----|-----|
| Herb     | TRSU3 | <i>Trifolium subterraneum</i> | 50  | 3.0 | 3.0 | 3.0 |
|          | BRMI2 | <i>Briza minor</i>            | 50  | 3.0 | 3.0 | 3.0 |
|          | LOPE  | <i>Lolium perenne</i>         | 50  | 0.4 | 0.4 | 0.4 |
|          | DIDO3 | <i>Dichondra donelliana</i>   | 50  | 0.2 | 0.2 | 0.2 |
|          | DACA3 | <i>Danthonia californica</i>  | 50  | 0.2 | 0.2 | 0.2 |
|          | CIVU  | <i>Cirsium vulgare</i>        | 50  | 0.2 | 0.2 | 0.2 |
|          | BRDI3 | <i>Bromus diandrus</i>        | 50  | 0.2 | 0.2 | 0.2 |
|          | CAPY2 | <i>Carduus pycnocephalus</i>  | 50  | 0.2 | 0.2 | 0.2 |
|          | ELGL  | <i>Elymus glaucus</i>         | 50  | 0.2 | 0.2 | 0.2 |
|          | GED1  | <i>Geranium dissectum</i>     | 50  | 0.2 | 0.2 | 0.2 |
|          | LOGA2 | <i>Logfia gallica</i>         | 50  | 0.2 | 0.2 | 0.2 |
|          | SIGA  | <i>Silene gallica</i>         | 50  | 0.2 | 0.2 | 0.2 |
|          | SOAS  | <i>Sonchus asper</i>          | 50  | 0.2 | 0.2 | 0.2 |
|          | TRDU2 | <i>Trifolium dubium</i>       | 50  | 0.2 | 0.2 | 0.2 |
|          | ERCI6 | <i>Erodium cicutarium</i>     | 50  | 0.2 | 0.2 | 0.2 |
|          | SABI3 | <i>Sanicula bipinnatifida</i> | 50  | 0.1 | 0.1 | 0.1 |
|          | TONO  | <i>Torilis nodosa</i>         | 50  | 0.1 | 0.1 | 0.1 |

***Nassella pulchra* – *Avena* spp. – *Bromus* spp. Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1), Coastal Franciscan/263Ag (6), Coastal Hills-Santa Rosa Plain/263Aj (1), and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 40.2         | 20–70         | –          |
| <b>Herb</b>                          | 40.2         | 20–70         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (6), SW (3)

**Macrotopography:** middle 1/3 of slope (4), middle to upper 1/3 of slope (1), ridge top (1), upper 1/3 of slope (2), upper 1/3 of slope to ridgetop (1)

**Microtopography:** concave (1), convex (8)

**Parent material:** Franciscan melange (2), mixed sedimentary (1), sandstone (1), sedimentary (3), serpentine (1), ultramafic (1)

**Soil texture:** clay or clay loam (3), loam or sandy loam (1), silt or silt loam (2)

**Slope steepness:** moderate/6-25° (7), steep/>25° (2)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1109 ft. | 237–2292 ft. |
| Slope             | 18.8°    | 8–28°        |
| Large rock cover  | 2.5%     | 0–6%         |
| Small rock cover  | 2.0%     | 1–5%         |
| Bare ground cover | 11.1%    | 0–48%        |
| Litter cover      | 69.3%    | 15–97%       |

**Samples Used to Describe Association (n=9)**

**Rapid Assessments:** none

**Relevés:** HEAD0335, HEAD0381, SONO0346, SONO0468, SONO0472, SONO0538, SONO0544, SONO0669, SONO0936

**SCV Global/State Rank:** G4G3?/S4S3?<sup>1</sup>

**STAND TABLE**

***Nassella pulchra* – *Avena* spp. – *Bromus* spp. Association**

n = 9

| Lifeform | Code   | Botanical Name                                       | Con | Avg  | Min | Max  |
|----------|--------|--|-----|------|-----|------|
| Herb     |        |  |     |      |     |      |
|          | NAPU4  | <i>Nassella pulchra</i>                              | 100 | 17.1 | 4.0 | 38.0 |
|          | AVBA   | <i>Avena barbata</i>                                 | 89  | 7.1  | 1.0 | 18.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 78  | 1.4  | 0.2 | 5.0  |
|          | BRMA   | <i>Briza maxima</i>                                  | 67  | 14.2 | 2.0 | 21.0 |
|          | BRDI3  | <i>Bromus diandrus</i>                               | 67  | 4.0  | 0.2 | 8.0  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 67  | 0.3  | 0.2 | 1.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                           | 44  | 6.1  | 0.2 | 18.0 |
|          | GAPA5  | <i>Galium parisiense</i>                             | 44  | 0.9  | 0.2 | 3.0  |
|          | CESO3  | <i>Centaurea solstitialis</i>                        | 33  | 10.1 | 0.2 | 18.0 |
|          | ERBO   | <i>Erodium botrys</i>                                | 33  | 2.4  | 0.2 | 4.0  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                          | 33  | 1.1  | 0.2 | 2.0  |
|          | GAAP2  | <i>Galium aparine</i>                                | 33  | 0.2  | 0.2 | 0.2  |
|          | SIDI   | <i>Sidalcea diploscypha</i>                          | 33  | 0.2  | 0.1 | 0.2  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                         | 33  | 0.2  | 0.1 | 0.2  |
|          | HYPE   | <i>Hypericum perforatum</i>                          | 22  | 6.0  | 4.0 | 8.0  |
|          | BRDI2  | <i>Brachypodium distachyon</i>                       | 22  | 5.0  | 1.0 | 9.0  |
|          | LASA   | <i>Lactuca saligna</i>                               | 22  | 3.0  | 3.0 | 3.0  |
|          | SABI3  | <i>Sanicula bipinnatifida</i>                        | 22  | 3.0  | 2.0 | 4.0  |
|          | LOPE   | <i>Lolium perenne</i>                                | 22  | 2.6  | 0.2 | 5.0  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                            | 22  | 2.5  | 2.0 | 3.0  |
|          | GAPH2  | <i>Gastridium phleoides</i>                          | 22  | 1.6  | 0.2 | 3.0  |
|          | LUBI   | <i>Lupinus bicolor</i>                               | 22  | 0.6  | 0.2 | 1.0  |
|          | LOMI   | <i>Lotus micranthus</i>                              | 22  | 0.6  | 0.2 | 1.0  |
|          | VISA   | <i>Vicia sativa</i>                                  | 22  | 0.6  | 0.2 | 1.0  |
|          | CHPO3  | <i>Chlorogalum pomeridianum</i>                      | 22  | 0.2  | 0.2 | 0.2  |
|          | DAPU3  | <i>Daucus pusillus</i>                               | 22  | 0.2  | 0.2 | 0.2  |
|          | ERCI6  | <i>Erodium cicutarium</i>                            | 22  | 0.2  | 0.2 | 0.2  |
|          | LASE   | <i>Lactuca serriola</i>                              | 22  | 0.2  | 0.2 | 0.2  |
|          | PEDU2  | <i>Petrorhagia dubia</i>                             | 22  | 0.2  | 0.2 | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Nassella pulchra* – *Avena* spp. – *Bromus* spp. Association**

n = 9

| Lifeform | Code  | Botanical Name                 | Con | Avg | Min | Max |
|----------|-------|--------------------------------|-----|-----|-----|-----|
| Herb     |       |                                |     |     |     |     |
|          | SOAS  | <i>Sonchus asper</i>           | 22  | 0.2 | 0.2 | 0.2 |
|          | TRMI4 | <i>Trifolium microcephalum</i> | 22  | 0.2 | 0.2 | 0.2 |
|          | BRMA3 | <i>Bromus madritensis</i>      | 22  | 0.2 | 0.2 | 0.2 |
|          | MECA2 | <i>Melica californica</i>      | 22  | 0.2 | 0.1 | 0.2 |
|          | BRMI2 | <i>Briza minor</i>             | 22  | 0.2 | 0.1 | 0.2 |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Nassella pulchra* – *Hemizonia congesta* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) and Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 62.5         | 30–85         | –          |
| Herb                          | 62.5         | 30–85         | <0.5–0.5   |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (1), NW (1), SE (3)

**Macrotopography:** middle 1/3 of slope (2), upper 1/3 of slope (3)

**Microtopography:** concave (1), convex (1), flat (3)

**Parent material:** Franciscan melange (1), metasedimentary (1), sedimentary (1), serpentine (1), ultramafic (1)

**Soil texture:** clay or clay loam (4)

**Slope steepness:** gentle/1-5° (2), moderate/6-25° (2), steep/>25° (1)

|                   | Mean    | Range       |
|-------------------|---------|-------------|
| Elevation         | 678 ft. | 441–932 ft. |
| Slope             | 13.2°   | 4–37°       |
| Large rock cover  | 3.7%    | 0–9%        |
| Small rock cover  | 1.4%    | 0–2%        |
| Bare ground cover | 17.8%   | 1–52%       |
| Litter cover      | 42.4%   | 10–70%      |

**Samples Used to Describe Association (n=5)**

**Rapid Assessments:** none

**Relevés:** HEAD0284, HEAD0351, HEAD0360, HEAD0368, SONO2192

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SCV Global/State Rank: G3/S3<sup>1</sup>

**STAND TABLE**

***Nassella pulchra* – *Hemizonia congesta* Provisional Association**

n = 5

| Lifeform | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Herb     | NAPU4  | <i>Nassella pulchra</i>                             | 100 | 11.2 | 4.0  | 18.0 |
|          | LOPE   | <i>Lolium perenne</i>                               | 100 | 10.2 | 3.0  | 18.0 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                          | 100 | 0.9  | 0.2  | 3.0  |
|          | DACA3  | <i>Danthonia californica</i>                        | 80  | 4.8  | 3.0  | 10.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                            | 80  | 2.3  | 0.2  | 3.0  |
|          | HECOC2 | * <i>Hemizonia congesta</i> ssp. <i>congesta</i>    | 60  | 6.3  | 3.0  | 8.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>      | 60  | 4.3  | 2.0  | 8.0  |
|          | CYEC   | <i>Cynosurus echinatus</i>                          | 60  | 2.1  | 0.2  | 3.0  |
|          | LACA7  | <i>Lasthenia californica</i>                        | 60  | 1.1  | 0.2  | 3.0  |
|          | LASA   | <i>Lactuca saligna</i>                              | 60  | 0.2  | 0.2  | 0.2  |
|          | RACA2  | <i>Ranunculus californicus</i>                      | 60  | 0.2  | 0.2  | 0.2  |
|          | ANAR   | <i>Anagallis arvensis</i>                           | 60  | 0.2  | 0.2  | 0.2  |
|          | PLER3  | <i>Plantago erecta</i>                              | 60  | 0.2  | 0.2  | 0.2  |
|          | TRDU2  | <i>Trifolium dubium</i>                             | 60  | 0.2  | 0.2  | 0.2  |
|          | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i> | 40  | 5.5  | 3.0  | 8.0  |
|          | HOB2   | <i>Hordeum brachyantherum</i>                       | 40  | 3.0  | 3.0  | 3.0  |
|          | TRLA16 | <i>Triteleia laxa</i>                               | 40  | 1.6  | 0.2  | 3.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                             | 40  | 1.6  | 0.2  | 3.0  |
|          | FEID   | <i>Festuca idahoensis</i>                           | 40  | 1.6  | 0.2  | 3.0  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>   | 40  | 1.6  | 0.1  | 3.0  |
|          | KOMA   | <i>Koeleria macrantha</i>                           | 40  | 1.6  | 0.1  | 3.0  |
|          | PEKE   | <i>Perideridia kelloggii</i>                        | 40  | 0.2  | 0.2  | 0.2  |
|          | SIGA   | <i>Silene gallica</i>                               | 40  | 0.2  | 0.2  | 0.2  |
|          | BRMI2  | <i>Briza minor</i>                                  | 40  | 0.2  | 0.2  | 0.2  |
|          | ELMU3  | <i>Elymus multisetus</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|          | LOWR2  | <i>Lotus wrangelianus</i>                           | 40  | 0.2  | 0.2  | 0.2  |
|          | RUAC3  | <i>Rumex acetosella</i>                             | 40  | 0.2  | 0.2  | 0.2  |
|          | TRMI5  | <i>Trifolium microdon</i>                           | 40  | 0.2  | 0.2  | 0.2  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                       | 40  | 0.2  | 0.2  | 0.2  |
|          | TRBI   | <i>Trifolium bifidum</i>                            | 40  | 0.2  | 0.2  | 0.2  |
|          | BRMA   | <i>Briza maxima</i>                                 | 20  | 38.0 | 38.0 | 38.0 |
|          | HECOL3 | * <i>Hemizonia congesta</i> ssp. <i>luzulifolia</i> | 20  | 38.0 | 38.0 | 38.0 |
|          | ELGL   | <i>Elymus glaucus</i>                               | 20  | 8.0  | 8.0  | 8.0  |
|          | JUNCU  | <i>Juncus</i>                                       | 20  | 8.0  | 8.0  | 8.0  |
|          | HECO7  | * <i>Hemizonia congesta</i>                         | 20  | 6.0  | 6.0  | 6.0  |
|          | GRHI   | <i>Grindelia hirsutula</i>                          | 20  | 3.0  | 3.0  | 3.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                     | 20  | 3.0  | 3.0  | 3.0  |
|          | JUBU   | <i>Juncus bufonius</i>                              | 20  | 3.0  | 3.0  | 3.0  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Nassella pulchra* – *Hemizonia congesta* Provisional Association**

n = 5

| Lifeform<br>Herb | Code   | Botanical Name   | Con | Avg | Min | Max |
|------------------|--------|--|-----|-----|-----|-----|
|                  | NAVAR  | <i>Navarretia</i>  | 20  | 3.0 | 3.0 | 3.0 |
|                  | DAPU3  | <i>Daucus pusillus</i>                                     | 20  | 3.0 | 3.0 | 3.0 |
|                  | CHPO3  | * <i>Chlorogalum pomeridianum</i>                          | 20  | 3.0 | 3.0 | 3.0 |
|                  | CAMU3  | <i>Calycadenia multiglandulosa</i>                         | 20  | 3.0 | 3.0 | 3.0 |
|                  | BRCA5  | <i>Bromus carinatus</i>                                    | 20  | 3.0 | 3.0 | 3.0 |
|                  | ACMI2  | <i>Achillea millefolium</i>                                | 20  | 3.0 | 3.0 | 3.0 |
|                  | ERNU3  | <i>Eriogonum nudum</i>                                     | 20  | 3.0 | 3.0 | 3.0 |
|                  | AVBA   | <i>Avena barbata</i>                                       | 20  | 3.0 | 3.0 | 3.0 |
|                  | VUMI   | <i>Vulpia microstachys</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | SAAP   | <i>Sagina apetala</i>                                      | 20  | 0.2 | 0.2 | 0.2 |
|                  | VISA   | <i>Vicia sativa</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRVEV  | <i>Triphysaria versicolor</i> ssp. <i>versicolor</i>       | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRUN6  | <i>Tristagma uniflorum</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRDI6  | <i>Trifolium dichotomum</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|                  | CHPOP4 | * <i>Chlorogalum pomeridianum</i> var. <i>pomeridianum</i> | 20  | 0.2 | 0.2 | 0.2 |
|                  | JUOC2  | <i>Juncus occidentalis</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | HYRA3  | <i>Hypochaeris radicata</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|                  | HOMUL  | <i>Hordeum murinum</i> ssp. <i>leporinum</i>               | 20  | 0.2 | 0.2 | 0.2 |
|                  | HESPS2 | * <i>Hesperervax sparsiflora</i> var. <i>sparsiflora</i>   | 20  | 0.2 | 0.2 | 0.2 |
|                  | GEDI   | <i>Geranium dissectum</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|                  | GAPO   | <i>Galium porrigens</i>                                    | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRMI4  | <i>Trifolium microcephalum</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | CRCO34 | <i>Crassula connata</i>                                    | 20  | 0.2 | 0.2 | 0.2 |
|                  | LODA   | <i>Lomatium dasycarpum</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | CHPOD  | * <i>Chlorogalum pomeridianum</i> var. <i>divaricatum</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | CEGL2  | <i>Cerastium glomeratum</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|                  | CADED3 | <i>Castilleja densiflora</i> ssp. <i>densiflora</i>        | 20  | 0.2 | 0.2 | 0.2 |
|                  | CALU9  | <i>Calochortus luteus</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|                  | ASGA   | <i>Astragalus gambelianus</i>                              | 20  | 0.2 | 0.2 | 0.2 |
|                  | AICA   | <i>Aira caryophyllea</i>                                   | 20  | 0.2 | 0.2 | 0.2 |
|                  | AGOSE  | <i>Agoseris</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | EUSP   | <i>Euphorbia spathulata</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|                  | PEAU3  | <i>Pentachaeta aurea</i>                                   | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRHI4  | <i>Trifolium hirtum</i>                                    | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRBA   | <i>Trifolium barbigerum</i>                                | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRAL5  | <i>Trifolium albopurpureum</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | SOAS   | <i>Sonchus asper</i>                                       | 20  | 0.2 | 0.2 | 0.2 |
|                  | RUPU3  | <i>Rumex pulcher</i>                                       | 20  | 0.2 | 0.2 | 0.2 |
|                  | RORO   | <i>Romulea rosea</i>                                       | 20  | 0.2 | 0.2 | 0.2 |
|                  | RAOC   | <i>Ranunculus occidentalis</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | LETA   | <i>Leontodon taraxacoides</i>                              | 20  | 0.2 | 0.2 | 0.2 |
|                  | PLLA   | <i>Plantago lanceolata</i>                                 | 20  | 0.2 | 0.2 | 0.2 |
|                  | LIBI5  | <i>Linum bienne</i>  | 20  | 0.2 | 0.2 | 0.2 |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**STAND TABLE** continued

***Nassella pulchra* – *Hemizonia congesta* Provisional Association**

n = 5

| Lifeform<br>Herb | Code   | Botanical Name  | Con | Avg | Min | Max |
|------------------|--------|---|-----|-----|-----|-----|
|                  | NALE2  | <i>Nassella lepida</i>                                  | 20  | 0.2 | 0.2 | 0.2 |
|                  | MOPU2  | <i>Monardella purpurea</i>                              | 20  | 0.2 | 0.2 | 0.2 |
|                  | MIDO   | <i>Microseris douglasii</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | MIBI   | <i>Microseris bigelovii</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | MADIA  | <i>Madia</i>  | 20  | 0.2 | 0.2 | 0.2 |
|                  | LOUT   | <i>Lomatium utriculatum</i>                             | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRERR  | <i>Triphysaria eriantha</i> ssp. <i>rosea</i>           | 20  | 0.2 | 0.2 | 0.2 |
|                  | POTET2 | <i>Polycarpon tetraphyllum</i> ssp. <i>tetraphyllum</i> | 20  | 0.2 | 0.2 | 0.2 |
|                  | TRMI3  | <i>Trichostema micranthum</i>                           | 20  | 0.2 | 0.2 | 0.2 |
|                  | BRELE  | <i>Brodiaea elegans</i> ssp. <i>elegans</i>             | 20  | 0.1 | 0.1 | 0.1 |
|                  | CEMU2  | <i>Centaurium muehlenbergii</i>                         | 20  | 0.1 | 0.1 | 0.1 |
|                  | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>    | 20  | 0.1 | 0.1 | 0.1 |
|                  | EPBR3  | <i>Epilobium brachycarpum</i>                           | 20  | 0.1 | 0.1 | 0.1 |
|                  | EPMI   | <i>Epilobium minutum</i>                                | 20  | 0.1 | 0.1 | 0.1 |
|                  | HESPB  | * <i>Hesperervax sparsiflora</i> var. <i>brevifolia</i> | 20  | 0.1 | 0.1 | 0.1 |
|                  | LOUNU  | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i>    | 20  | 0.1 | 0.1 | 0.1 |
|                  | SABI3  | <i>Sanicula bipinnatifida</i>                           | 20  | 0.1 | 0.1 | 0.1 |
|                  | TRFU   | <i>Trifolium fucatum</i>                                | 20  | 0.1 | 0.1 | 0.1 |
|                  | TRPU16 | <i>Triphysaria pusilla</i>                              | 20  | 0.1 | 0.1 | 0.1 |
|                  | AGGR   | <i>Agoseris grandiflora</i>                             | 20  | 0.1 | 0.1 | 0.1 |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

***Nassella pulchra* – *Lolium perenne* – *Plantago erecta* Serpentine  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (5) and Coastal Hills-Santa Rosa Plain/263Aj (7) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 45.4         | 20–80         | –          |
| <b>Herb</b>             | 45.4         | 20–80         | <0.5–0.5   |
| <b>Shrub</b>            | 0.2          | 0–1           | <0.5–0.5   |

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|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NE (3), NW (2), SE (6), SW (2)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (1), ridge top (1), upper 1/3 of slope (10)

**Microtopography:** convex (7), flat (2), undulating (4)

**Parent material:** metasedimentary (1), sandstone (1), serpentine (8), ultramafic (3)

**Soil texture:** clay or clay loam (8), loam or sandy loam (2)

**Slope steepness:** moderate/6-25° (12), steep/>25° (1)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 584 ft. | 193–1093 ft. |
| <b>Slope</b>             | 17.2°   | 7–30°        |
| <b>Large rock cover</b>  | 13.3%   | 1–30%        |
| <b>Small rock cover</b>  | 10.0%   | 0–32%        |
| <b>Bare ground cover</b> | 21.7%   | 2–81%        |
| <b>Litter cover</b>      | 38.2%   | 10–82%       |

**Samples Used to Describe Association (n=13)**

**Rapid Assessments:** none

**Relevés:** HEAD0090, HEAD0104, HEAD0216, HEAD0346, HEAD0352, HEAD0367, HEAD0386, HEAD0387, HEAD0411, HEAD0417, MILOB125, SONO0351, SONO2186

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Nassella pulchra* – *Lolium perenne* – *Plantago erecta* Serpentine Provisional Association**

n = 13

| Lifeform | Code   | Botanical Name                                      | Con | Avg  | Min | Max  |
|----------|--------|---|-----|------|-----|------|
| Herb     |        |   |     |      |     |      |
|          | LOPE   | <i>Lolium perenne</i>                               | 92  | 15.0 | 5.0 | 38.0 |
|          | NAPU4  | <i>Nassella pulchra</i>                             | 92  | 11.0 | 1.0 | 18.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                            | 85  | 9.1  | 0.2 | 38.0 |
|          | ESCA2  | <i>Eschscholzia californica</i>                     | 85  | 4.1  | 0.2 | 18.0 |
|          | PLER3  | <i>Plantago erecta</i>                              | 77  | 4.3  | 0.2 | 18.0 |
|          | DAPU3  | <i>Daucus pusillus</i>                              | 69  | 0.9  | 0.2 | 3.0  |
|          | VUMI   | <i>Vulpia microstachys</i>                          | 69  | 0.5  | 0.2 | 3.0  |
|          | LACA7  | <i>Lasthenia californica</i>                        | 62  | 7.0  | 0.2 | 38.0 |
|          | ACMI2  | <i>Achillea millefolium</i>                         | 62  | 1.0  | 0.2 | 3.0  |
|          | LOWR2  | <i>Lotus wrangelianus</i>                           | 62  | 0.8  | 0.2 | 5.0  |
|          | ELMU3  | <i>Elymus multisetus</i>                            | 54  | 2.1  | 0.2 | 8.0  |
|          | SIBE   | <i>Sisyrinchium bellum</i>                          | 54  | 2.1  | 0.2 | 5.0  |
|          | CASUS2 | <i>Calystegia subacaulis</i> ssp. <i>subacaulis</i> | 54  | 0.6  | 0.2 | 3.0  |
|          | LASA   | <i>Lactuca saligna</i>                              | 54  | 0.3  | 0.2 | 1.0  |
|          | SABI3  | <i>Sanicula bipinnatifida</i>                       | 54  | 0.2  | 0.1 | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**STAND TABLE** continued

***Nassella pulchra* – *Lolium perenne* – *Plantago erecta* Serpentine Provisional Association**

n = 13

| Lifeform<br>Herb | Code   | Botanical Name  | Con | Avg | Min | Max  |
|------------------|--------|---|-----|-----|-----|------|
|                  | NALE2  | <i>Nassella lepida</i>                                    | 46  | 6.7 | 0.2 | 18.0 |
|                  | VUBR   | <i>Vulpia bromoides</i>                                   | 46  | 1.5 | 0.2 | 8.0  |
|                  | LAPL   | <i>Layia platyglossa</i>                                  | 38  | 4.3 | 0.1 | 18.0 |
|                  | KOMA   | <i>Koeleria macrantha</i>                                 | 38  | 1.9 | 0.2 | 3.0  |
|                  | TRMI5  | <i>Trifolium microdon</i>                                 | 38  | 1.3 | 0.2 | 3.0  |
|                  | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i>         | 38  | 0.8 | 0.2 | 3.0  |
|                  | CHPO3  | * <i>Chlorogalum pomeridianum</i>                         | 38  | 0.3 | 0.1 | 1.0  |
|                  | SIGA   | <i>Silene gallica</i>                                     | 38  | 0.2 | 0.1 | 0.2  |
|                  | DACA3  | <i>Danthonia californica</i>                              | 31  | 4.8 | 0.2 | 8.0  |
|                  | FEID   | <i>Festuca idahoensis</i>                                 | 31  | 4.3 | 3.0 | 8.0  |
|                  | HECOC2 | <i>Hemizonia congesta</i> ssp. <i>congesta</i>            | 31  | 2.3 | 0.2 | 3.0  |
|                  | MIDO3  | <i>Minuartia douglasii</i>                                | 31  | 2.2 | 0.2 | 8.0  |
|                  | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>            | 31  | 2.2 | 0.2 | 8.0  |
|                  | TRLA16 | <i>Triteleia laxa</i>                                     | 31  | 1.6 | 0.2 | 3.0  |
|                  | LOHU2  | <i>Lotus humistratus</i>                                  | 31  | 0.9 | 0.2 | 3.0  |
|                  | ASGA   | <i>Astragalus gambelianus</i>                             | 31  | 0.2 | 0.2 | 0.2  |
|                  | HESP9  | * <i>Hesperervax sparsiflora</i>                          | 31  | 0.2 | 0.2 | 0.2  |
|                  | CALU9  | <i>Calochortus luteus</i>                                 | 31  | 0.2 | 0.2 | 0.2  |
|                  | EPBR3  | <i>Epilobium brachycarpum</i>                             | 31  | 0.2 | 0.1 | 0.2  |
|                  | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i>      | 31  | 0.2 | 0.1 | 0.2  |
|                  | AVBA   | <i>Avena barbata</i>                                      | 23  | 2.8 | 0.2 | 8.0  |
|                  | MOPU2  | <i>Monardella purpurea</i>                                | 23  | 2.8 | 0.2 | 8.0  |
|                  | ELGL   | <i>Elymus glaucus</i>                                     | 23  | 2.3 | 1.0 | 3.0  |
|                  | LODA   | <i>Lomatium dasycarpum</i>                                | 23  | 1.2 | 0.1 | 3.2  |
|                  | CHPOD  | * <i>Chlorogalum pomeridianum</i> var. <i>divaricatum</i> | 23  | 1.1 | 0.2 | 3.0  |
|                  | TRBI   | <i>Trifolium bifidum</i>                                  | 23  | 1.1 | 0.2 | 3.0  |
|                  | TRAL5  | <i>Trifolium albopurpureum</i>                            | 23  | 1.1 | 0.2 | 3.0  |
|                  | LOUT   | <i>Lomatium utriculatum</i>                               | 23  | 1.1 | 0.2 | 3.0  |
|                  | PLCA5  | <i>Platystemon californicus</i>                           | 23  | 1.1 | 0.2 | 3.0  |
|                  | CRCO34 | <i>Crassula connata</i>                                   | 23  | 0.2 | 0.2 | 0.2  |
|                  | ANAR   | <i>Anagallis arvensis</i>                                 | 23  | 0.2 | 0.2 | 0.2  |
|                  | HESPS2 | * <i>Hesperervax sparsiflora</i> var. <i>sparsiflora</i>  | 23  | 0.2 | 0.2 | 0.2  |
|                  | MECA2  | <i>Melica californica</i>                                 | 23  | 0.2 | 0.2 | 0.2  |
|                  | TRDI6  | <i>Trifolium dichotomum</i>                               | 23  | 0.1 | 0.1 | 0.2  |

\* This species is represented more than once in the table because: 1) it was found in more than one lifeform, or 2) it was identified to variety or subspecies in a subset of the surveys. Constancy is higher for this species than indicated on each individual line.

**Noteworthy Taxa**

*Gilia capitata* ssp. *tomentosa*

CA rare plant rank: 1B.1

NatureServe Global/State rank: G5T2/S2

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

**Noteworthy Taxa, continued**

*Hesperervax sparsiflora* var. *brevifolia*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G4T3/S2

***Nassella pulchra* – *Melica californica* – Annual Grass Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 26.0         | 23–29         | –          |
| <b>Herb</b>                          | 25.0         | 23–27         | 0.5–1      |
| <b>Shrub</b>                         | 2.0          | 0–4           | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (1), SW (1)

**Macrotopography:** middle 1/3 of slope (1), upper 1/3 of slope to ridgetop (1)

**Microtopography:** flat (1), undulating (1)

**Parent material:** sandstone (1), volcanic (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), steep/>25° (1)

|                          | Mean     | Range        |
|--------------------------|----------|--------------|
| <b>Elevation</b>         | 1127 ft. | 810–1443 ft. |
| <b>Slope</b>             | 16.0°    | 2–30°        |
| <b>Large rock cover</b>  | 9.7%     | 0–19%        |
| <b>Small rock cover</b>  | 36.6%    | 13–60%       |
| <b>Bare ground cover</b> | 17.0%    | 14–20%       |
| <b>Litter cover</b>      | 32.5%    | 15–50%       |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none

**Relevés:** SONO0403, SONO2025

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Nassella pulchra* – *Melica californica* – Annual Grass Association**

n = 2

| Lifeform | Code | Botanical Name                    | Con | Avg | Min | Max |
|----------|------|-----------------------------------|-----|-----|-----|-----|
| Shrub    | TODI | <i>Toxicodendron diversilobum</i> | 50  | 4.0 | 4.0 | 4.0 |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Nassella pulchra* – *Melica californica* – Annual Grass Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | BRDI2       | <i>Brachypodium distachyon</i>                       | 100        | 9.0        | 8.0        | 10.0       |
|                     | NAPU4       | <i>Nassella pulchra</i>                              | 100        | 3.5        | 2.0        | 5.0        |
|                     | AVBA        | <i>Avena barbata</i>                                 | 100        | 3.5        | 2.0        | 5.0        |
|                     | BRHO2       | <i>Bromus hordeaceus</i>                             | 100        | 2.1        | 0.2        | 4.0        |
|                     | ESCA2       | <i>Eschscholzia californica</i>                      | 100        | 2.0        | 2.0        | 2.0        |
|                     | MECA2       | <i>Melica californica</i>                            | 100        | 2.0        | 1.0        | 3.0        |
|                     | BRDI3       | <i>Bromus diandrus</i>                               | 100        | 1.5        | 1.0        | 2.0        |
|                     | ERBO        | <i>Erodium botrys</i>                                | 100        | 0.6        | 0.2        | 1.0        |
|                     | HYGL2       | <i>Hypochaeris glabra</i>                            | 100        | 0.6        | 0.2        | 1.0        |
|                     | PLNO        | <i>Plagiobothrys nothofulvus</i>                     | 100        | 0.6        | 0.2        | 1.0        |
|                     | CAPY2       | <i>Carduus pycnocephalus</i>                         | 100        | 0.2        | 0.2        | 0.2        |
|                     | ERCI6       | <i>Erodium cicutarium</i>                            | 50         | 5.0        | 5.0        | 5.0        |
|                     | PHDI        | <i>Phacelia distans</i>                              | 50         | 1.0        | 1.0        | 1.0        |
|                     | TRAL5       | <i>Trifolium albopurpureum</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | ACMI2       | <i>Achillea millefolium</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                     | AGGR        | <i>Agoseris grandiflora</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                     | THCU        | <i>Thysanocarpus curvipes</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                     | TRIFO       | <i>Trifolium</i>                                     | 50         | 0.2        | 0.2        | 0.2        |
|                     | TRHI4       | <i>Trifolium hirtum</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|                     | VIVI        | <i>Vicia villosa</i>                                 | 50         | 0.2        | 0.2        | 0.2        |
|                     | CESO3       | <i>Centaurea solstitialis</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                     | BRELE       | <i>Brodiaea elegans</i> ssp. <i>elegans</i>          | 50         | 0.2        | 0.2        | 0.2        |
|                     | AICA        | <i>Aira caryophyllea</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                     | AVFA        | <i>Avena fatua</i>                                   | 50         | 0.2        | 0.2        | 0.2        |
|                     | BRMA        | <i>Briza maxima</i>                                  | 50         | 0.2        | 0.2        | 0.2        |
|                     | LOHU2       | <i>Lotus humistratus</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                     | GAPA5       | <i>Galium parisiense</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                     | GEMO        | <i>Geranium molle</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|                     | HECR2       | <i>Hedypnois cretica</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                     | LAAN3       | <i>Lathyrus angulatus</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|                     | LINUM       | <i>Linum</i>   | 50         | 0.2        | 0.2        | 0.2        |
|                     | DICHE2      | <i>Dichelostemma</i>                                 | 50         | 0.2        | 0.2        | 0.2        |
|                     | LOPE        | <i>Lolium perenne</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|                     | CRSE11      | <i>Croton setigerus</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|                     | LOUNU       | <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> | 50         | 0.2        | 0.2        | 0.2        |
|                     | LUBI        | <i>Lupinus bicolor</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|                     | PLER3       | <i>Plantago erecta</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|                     | POSE        | <i>Poa secunda</i>                                   | 50         | 0.2        | 0.2        | 0.2        |
|                     | SABI3       | <i>Sanicula bipinnatifida</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                     | SHAR2       | <i>Sherardia arvensis</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|                     | LOGA2       | <i>Logfia gallica</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|                     | GAAP2       | <i>Galium aparine</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|                     | CLARK       | <i>Clarkia</i>                                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | CHLOR3      | <i>Chlorogalum</i>                                   | 50         | 0.2        | 0.2        | 0.2        |
|                     | STVI2       | <i>Stephanomeria virgata</i>                         | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2LICHN      | Lichen   | 50         | 2.0        | 2.0        | 2.0        |

**Noteworthy Taxa**

*Hemizonia congesta* ssp. *congesta*

CA rare plant rank: 1B.2

NatureServe Global/State rank: G5T1T2/S1S2

***Nassella pulchra* – *Plantago lanceolata* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (3) and Coastal Hills-Santa Rosa Plain/263Aj (4) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover      | Height (m) |
|--------------------------------------|--------------|--------------------|------------|
| <b>Total vegetation</b>              | 60.8         | 33–80 <sup>1</sup> | –          |
| <b>Herb</b>                          | 66.6         | 33–90              | <0.5–0.5   |
| <b>Shrub</b>                         | 0.9          | 0–3                | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0                | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0                | –          |
| <b>Conifer</b>                       | 0.0          | 0–0                | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (4)

**Macrotopography:** lower 1/3 of slope (1), middle 1/3 of slope (2), upper 1/3 of slope (4)

**Microtopography:** concave (2), convex (2), flat (1), undulating (2)

**Parent material:** Franciscan melange (1), metasedimentary (4), sandstone (1), sedimentary (1)

**Soil texture:** clay or clay loam (5), loam or sandy loam (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (2), moderate/6-25° (3)

|                          | Mean    | Range        |
|--------------------------|---------|--------------|
| <b>Elevation</b>         | 740 ft. | 137–1115 ft. |
| <b>Slope</b>             | 6.7°    | 0–17°        |
| <b>Large rock cover</b>  | 0.4%    | 0–1%         |
| <b>Small rock cover</b>  | 4.9%    | 0–25%        |
| <b>Bare ground cover</b> | 19.6%   | 0–85%        |
| <b>Litter cover</b>      | 55.6%   | 2–91%        |

**Samples Used to Describe Association (n=7)**

**Rapid Assessments:** none

**Relevés:** HEAD0062, HEAD0202, HEAD0260, HEAD0276, HEAD0358, SONO0455, SONO2184

**SCV Global/State Rank:** G3?/S3?<sup>2</sup>

<sup>1</sup> Herb % cover is higher than Total % cover because total cover was not recorded on some Headlands surveys.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE**

***Nassella pulchra* – *Plantago lanceolata* Provisional Association**

n = 7

| Lifeform | Code   | Botanical Name                                    | Con | Avg  | Min | Max  |
|----------|--------|---|-----|------|-----|------|
| Shrub    | BAPI   | <i>Baccharis pilularis</i>                        | 29  | 3.0  | 3.0 | 3.0  |
| Herb     | NAPU4  | <i>Nassella pulchra</i>                           | 100 | 17.9 | 7.0 | 38.0 |
|          | PLLA   | <i>Plantago lanceolata</i>                        | 100 | 15.1 | 3.0 | 38.0 |
|          | HYRA3  | <i>Hypochaeris radicata</i>                       | 100 | 7.1  | 0.2 | 38.0 |
|          | BRHO2  | <i>Bromus hordeaceus</i>                          | 100 | 4.1  | 0.2 | 11.0 |
|          | LOPE   | <i>Lolium perenne</i>                             | 86  | 12.0 | 0.2 | 38.0 |
|          | CYEC   | <i>Cynosurus echinatus</i>                        | 86  | 3.2  | 0.2 | 18.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                         | 86  | 0.2  | 0.2 | 0.2  |
|          | LIBI5  | <i>Linum bienne</i>                               | 71  | 2.3  | 0.2 | 8.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                           | 57  | 19.3 | 3.0 | 38.0 |
|          | SIBE   | <i>Sisyrinchium bellum</i>                        | 57  | 2.9  | 0.2 | 8.0  |
|          | BRMI2  | <i>Briza minor</i>                                | 57  | 0.2  | 0.2 | 0.2  |
|          | 2DAPI  | <i>Danthonia pilosa</i>                           | 43  | 14.7 | 3.0 | 38.0 |
|          | ERBO   | <i>Erodium botrys</i>                             | 43  | 3.4  | 0.2 | 8.0  |
|          | TRSU3  | <i>Trifolium subterraneum</i>                     | 43  | 2.1  | 0.2 | 3.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                            | 43  | 1.1  | 0.2 | 3.0  |
|          | LOGA2  | <i>Logfia gallica</i>                             | 43  | 0.2  | 0.2 | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>                            | 43  | 0.2  | 0.2 | 0.2  |
|          | DACA3  | <i>Danthonia californica</i>                      | 43  | 0.2  | 0.2 | 0.2  |
|          | JUPA2  | <i>Juncus patens</i>                              | 43  | 0.2  | 0.2 | 0.2  |
|          | SIGA   | <i>Silene gallica</i>                             | 43  | 0.2  | 0.2 | 0.2  |
|          | AICA   | <i>Aira caryophylla</i>                           | 43  | 0.2  | 0.2 | 0.2  |
|          | AVBA   | <i>Avena barbata</i>                              | 43  | 0.2  | 0.2 | 0.2  |
|          | HOLA   | <i>Holcus lanatus</i>                             | 29  | 10.5 | 3.0 | 18.0 |
|          | DIDO3  | <i>Dichondra donelliana</i>                       | 29  | 10.5 | 3.0 | 18.0 |
|          | JUBU   | <i>Juncus bufonius</i>                            | 29  | 9.1  | 0.2 | 18.0 |
|          | BRDI2  | <i>Brachypodium distachyon</i>                    | 29  | 5.5  | 3.0 | 8.0  |
|          | LOTUS  | <i>Lotus</i>                                      | 29  | 4.1  | 0.2 | 8.0  |
|          | LETA   | <i>Leontodon taraxacoides</i>                     | 29  | 3.0  | 3.0 | 3.0  |
|          | IRDO   | <i>Iris douglasiana</i>                           | 29  | 3.0  | 3.0 | 3.0  |
|          | TRDU2  | <i>Trifolium dubium</i>                           | 29  | 1.6  | 0.2 | 3.0  |
|          | KOMA   | <i>Koeleria macrantha</i>                         | 29  | 1.6  | 0.2 | 3.0  |
|          | HOMAG  | <i>Hordeum marinum</i> ssp. <i>gussonianum</i>    | 29  | 0.6  | 0.2 | 1.0  |
|          | VISA   | <i>Vicia sativa</i>                               | 29  | 0.3  | 0.2 | 0.4  |
|          | BRCA5  | <i>Bromus carinatus</i>                           | 29  | 0.2  | 0.2 | 0.2  |
|          | CAPU18 | <i>Calystegia purpurata</i>                       | 29  | 0.2  | 0.2 | 0.2  |
|          | PLER3  | <i>Plantago erecta</i>                            | 29  | 0.2  | 0.2 | 0.2  |
|          | TRMA2  | <i>Trifolium macraei</i>                          | 29  | 0.2  | 0.2 | 0.2  |
|          | LUCO6  | <i>Luzula comosa</i>                              | 29  | 0.2  | 0.2 | 0.2  |
|          | TRLA16 | <i>Triteleia laxa</i>                             | 29  | 0.2  | 0.2 | 0.2  |
|          | BRTET  | <i>Brodiaea terrestris</i> ssp. <i>terrestris</i> | 29  | 0.2  | 0.2 | 0.2  |
|          | SOOL   | <i>Sonchus oleraceus</i>                          | 29  | 0.2  | 0.2 | 0.2  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                      | 29  | 0.2  | 0.1 | 0.2  |
|          | CAGY3  | <i>Carex gynodynamis</i>                          | 29  | 0.2  | 0.1 | 0.2  |
|          | LOAN2  | <i>Lotus angustissimus</i>                        | 29  | 0.2  | 0.1 | 0.2  |



## ***Nassella pulchra* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 35.0                | 35                   | –                 |
| <b>Herb</b>                          | 35.0                | 35                   | <0.5–0.5          |
| <b>Shrub</b>                         | 0.2                 | 0.2                  | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0                    | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0                    | –                 |
| <b>Conifer</b>                       | 0.0                 | 0                    | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** SE (1)

**Macrotopography:** middle 1/3 of slope (1)

**Microtopography:** undulating (1)

**Parent material:** metasedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** moderate/6-25° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 701 ft.     | 701 ft.      |
| <b>Slope</b>             | 14.0°       | 14°          |
| <b>Large rock cover</b>  | 0.0%        | 0%           |
| <b>Small rock cover</b>  | 1.2%        | 1.2%         |
| <b>Bare ground cover</b> | 16.0%       | 16%          |
| <b>Litter cover</b>      | 80.0%       | 80%          |

### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** SONO0408

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

### **STAND TABLE**

#### ***Nassella pulchra* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--------------------------------|------------|------------|------------|------------|
| <b>Shrub</b>    | BAPI        | <i>Baccharis pilularis</i>     | 100        | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>     | NAPU4       | <i>Nassella pulchra</i>        | 100        | 25.0       | 25.0       | 25.0       |
|                 | BRDI2       | <i>Brachypodium distachyon</i> | 100        | 3.0        | 3.0        | 3.0        |
|                 | HOLCU       | <i>Holcus</i>                  | 100        | 3.0        | 3.0        | 3.0        |
|                 | LOPE        | <i>Lolium perenne</i>          | 100        | 1.0        | 1.0        | 1.0        |
|                 | CIVU        | <i>Cirsium vulgare</i>         | 100        | 1.0        | 1.0        | 1.0        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Nassella pulchra* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | JUPA2       | <i>Juncus patens</i>                      | 100        | 1.0        | 1.0        | 1.0        |
|                 | SOOL        | <i>Sonchus oleraceus</i>                  | 100        | 0.2        | 0.2        | 0.2        |
|                 | SIBE        | <i>Sisyrinchium bellum</i>                | 100        | 0.2        | 0.2        | 0.2        |
|                 | PLLA        | <i>Plantago lanceolata</i>                | 100        | 0.2        | 0.2        | 0.2        |
|                 | OXALP       | <i>Oxalis albicans</i> ssp. <i>pilosa</i> | 100        | 0.2        | 0.2        | 0.2        |
|                 | CAREX       | <i>Carex</i>                              | 100        | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>                      | 100        | 0.2        | 0.2        | 0.2        |
|                 | BRAR5       | <i>Bromus arvensis</i>                    | 100        | 0.2        | 0.2        | 0.2        |

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***Nuphar* spp. – *Potamogeton* spp. – *Lemna* spp. Freshwater Aquatic Provisional Alliance**

**Pond-lily – pondweed – duckweed beds**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Lemna* spp., *Nuphar lutea* ssp. *polysepala*, *Potamogeton* spp., *Spirodela* spp., *Wolffia* spp. and/or *Wolffiella* spp. dominate or co-dominate on the water surface with *Azolla* spp., *Brasenia schreberi*, *Carex limosa*, *Carex utriculata*, *Carex vesicaria*, *Egeria densa*, *Menyanthes trifoliata*, *Polygonum amphibium*, *Potamogeton* spp., *Scirpus* spp., *Sparganium* spp., *Stuckenia* spp., *Torreyochloa* spp., *Typha* spp., and *Utricularia macrorhiza*.

*Nuphar lutea* is a cosmopolitan plant including six subspecies in North America; *Nuphar lutea* ssp. *polysepala* occurs in California. Many botanical references use the name *Nuphar polysepala* for this subspecies. *Nuphar lutea* stands are monospecific or, less commonly, mixed with other floating-leaved hydrophytes.

The *Jepson Manual* (Hickman 1993) lists 13 duckweed species in the *Lemna*, *Spirodela*, *Wolffia*, and *Wolffiella* genera. Individual tolerances vary little among the species. *Lemna gibba*, *L. minor*, *L. minuscula*, and *L. turionifera* grow statewide. *Lemna aequinoctialis* grows in transmontane California. *Lemna trisulca* and *L. valdiviana* grow in the mountains, forming tangled masses below the water surface or under other plants. *Spirodela polyrrhiza* occurs throughout the state. Most species of *Wolffia*, except *W. globosa*, are uncommon. *Wolffiella lingulata* is more common than *Wolffiella oblonga*.

Stands of floating-leaved hydrophytes tend to have established, perennial-rooted species such as *Potamogeton*, *Sparganium*, or *Nuphar* intermixed with small annual *Lemna* spp. or *Wolffia* mats, which wax and wane over the seasons and from year to year. Since many stands contain both annual and perennial plants, the NVCS has determined that they should be treated inclusively, with early seral or non-permanent water typically dominated by the small annual detached floating species.

More complex stands tend to occur in small lakes and ponds of higher elevations. These include shallow-rooting emergent herbs such as *Carex* spp. and *Scirpus* spp., and are transitional to wet meadows or marshes. Some stands include species such as *Menyanthes* and *Utricularia* spp., which are characteristic plants in low-nutrient, acidic fens.

Sonoma County

A few small ponds or ox-bow lakes with *Nuphar* spp., *Brasenia schreberi*, or mixtures of other species characteristic of this alliance have been sampled in the county. All have been close to the coast in the summer fog zone. Higher elevation inland stands, such as occur in the higher Inner North Coast Ranges, have not been observed locally. *Utricularia macrorhiza* was associated with a single stand in a sag pond along the San Andreas Fault line near Stewarts Point.

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**Local Alliance Summary (n = 3)**

**Elevation:** 34–1102 ft, mean 501 ft

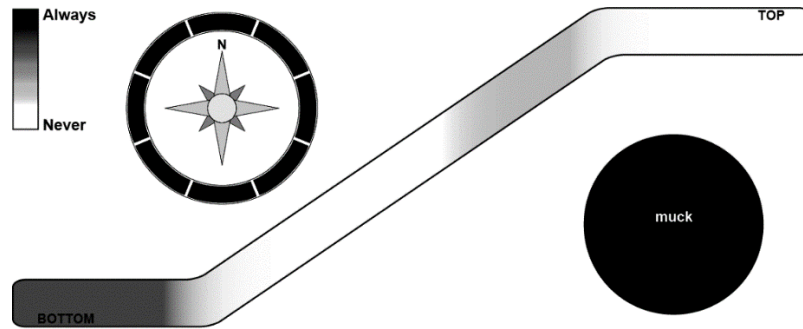
**SCV Global/State Rank:** G5/S3<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 61.7         | 30–90         | –          |
| <b>Herb</b>                          | 61.3         | 29–90         | <0.5–2     |
| <b>Shrub</b>                         | 0.1          | 0–0.2         | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 2–5        |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 2–5        |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0–0°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 0.0%  | 0–0%  |
| <b>Bare ground cover</b> | 24.3% | 0–73% |
| <b>Litter cover</b>      | 3.3%  | 0–10% |

**Associations within this Alliance:**

- Brasenia schreberi* Provisional Association
- Nuphar lutea* ssp. *polysepala* Provisional Association

**STAND TABLE**

***Nuphar* spp. – *Potamogeton* spp. – *Lemna* spp. Freshwater Aquatic Provisional Alliance**

n = 3

| Lifeform     | Code   | Botanical Name                                   | Con | Avg  | Min  | Max  |
|--------------|--------|--|-----|------|------|------|
| <b>Tree</b>  |        |  |     |      |      |      |
|              | ALRU2  | <i>Alnus rubra</i>                               | 33  | 0.2  | 0.2  | 0.2  |
| <b>Shrub</b> |        |  |     |      |      |      |
|              | MOCA6  | <i>Morella californica</i>                       | 33  | 0.2  | 0.2  | 0.2  |
|              | RHOC   | <i>Rhododendron occidentale</i>                  | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  |        |  |     |      |      |      |
|              | NULUP  | <i>Nuphar lutea</i> ssp. <i>polysepala</i>       | 67  | 39.0 | 28.0 | 50.0 |
|              | BRSC   | <i>Brasenia schreberi</i>                        | 33  | 65.0 | 65.0 | 65.0 |
|              | HIVU2  | <i>Hippuris vulgaris</i>                         | 33  | 17.0 | 17.0 | 17.0 |
|              | POPUP4 | <i>Polygonum punctatum</i> var. <i>punctatum</i> | 33  | 10.0 | 10.0 | 10.0 |
|              | SOLAN  | <i>Solanum</i>                                   | 33  | 10.0 | 10.0 | 10.0 |
|              | OESA   | <i>Oenanthe sarmentosa</i>                       | 33  | 2.0  | 2.0  | 2.0  |
|              | ALLA2  | <i>Alisma lanceolatum</i>                        | 33  | 1.0  | 1.0  | 1.0  |

**STAND TABLE** continued

***Nuphar* spp. – *Potamogeton* spp. – *Lemna* spp. Freshwater Aquatic Provisional Alliance**

n = 3

| Lifeform            | Code   | Botanical Name               | Con | Avg  | Min  | Max  |
|---------------------|--------|------------------------------|-----|------|------|------|
| <b>Herb</b>         |        |                              |     |      |      |      |
|                     | CABA4  | <i>Carex barbarae</i>        | 33  | 1.0  | 1.0  | 1.0  |
|                     | PONA4  | <i>Potamogeton natans</i>    | 33  | 1.0  | 1.0  | 1.0  |
|                     | RARE3  | <i>Ranunculus repens</i>     | 33  | 1.0  | 1.0  | 1.0  |
|                     | ATFI   | <i>Athyrium filix-femina</i> | 33  | 0.2  | 0.2  | 0.2  |
|                     | CAOB3  | <i>Carex obnupta</i>         | 33  | 0.2  | 0.2  | 0.2  |
|                     | ERGL11 | <i>Erechtites glomeratus</i> | 33  | 0.2  | 0.2  | 0.2  |
|                     | TYPHA  | <i>Typha</i>                 | 33  | 0.2  | 0.2  | 0.2  |
|                     | TYLA   | <i>Typha latifolia</i>       | 33  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |                              |     |      |      |      |
|                     | 2ALGA  | Alga                         | 33  | 16.0 | 16.0 | 16.0 |
|                     | 2MOSS  | Moss                         | 33  | 0.2  | 0.2  | 0.2  |

***Brasenia shreberi* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 65.0         | 65            | –          |
| <b>Herb</b>                          | 65.0         | 65            | <0.5–0.5   |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1)

**Macrotopography:** upper 1/3 of slope (1)

**Microtopography:** flat (1)

**Parent material:** sandstone (1)

**Soil texture:** no data

**Slope steepness:** flat/0° (1)

|                          | Mean     | Range    |
|--------------------------|----------|----------|
| <b>Elevation</b>         | 1102 ft. | 1102 ft. |
| <b>Slope</b>             | 0.0°     | 0°       |
| <b>Large rock cover</b>  | 0.0%     | 0%       |
| <b>Small rock cover</b>  | 0.0%     | 0%       |
| <b>Bare ground cover</b> | 0.0%     | 0%       |
| <b>Litter cover</b>      | 0.0%     | 0%       |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO2185  
**Relevés:** none

**SCV Global/State Rank:** G4?/S2?¹

**STAND TABLE**

***Brasenia schreberi* Provisional Association**

n = 1

| Lifeform     | Code  | Botanical Name            | Con | Avg  | Min  | Max  |
|--------------|-------|---------------------------|-----|------|------|------|
| Herb         | BRSC  | <i>Brasenia schreberi</i> | 100 | 65.0 | 65.0 | 65.0 |
| Non-vascular | 2ALGA | Alga                      | 100 | 16.0 | 16.0 | 16.0 |

***Nuphar lutea* ssp. *polysepala* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 60.0         | 30–90         | –          |
| <b>Herb</b>                          | 59.5         | 29–90         | <0.5–2     |
| <b>Shrub</b>                         | 0.1          | 0–0.2         | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.1          | 0–0.2         | 2–5        |
| <b>Hardwood</b>                      | 0.1          | 0–0.2         | 2–5        |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2)

**Macrotopography:** bottom (2)

**Microtopography:** flat (2)

**Parent material:** mixed alluvium (1), sedimentary (1)

**Soil texture:** muck (1)

**Slope steepness:** flat/0° (2)

|                          | Mean    | Range      |
|--------------------------|---------|------------|
| <b>Elevation</b>         | 200 ft. | 34–366 ft. |
| <b>Slope</b>             | 0.0°    | 0–0°       |
| <b>Large rock cover</b>  | 0.0%    | 0–0%       |
| <b>Small rock cover</b>  | 0.0%    | 0–0%       |
| <b>Bare ground cover</b> | 36.5%   | 0–73%      |
| <b>Litter cover</b>      | 5.0%    | 0–10%      |

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Samples Used to Describe Association** (n=2)  
**Rapid Assessments:** SONO0098, SONO0397  
**Relevés:** none

**SCV Global/State Rank:** G5/S3<sup>1</sup>

**STAND TABLE**

***Nuphar lutea* ssp. *polysepala* Provisional Association**

n = 2

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                            | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|--|------------|------------|------------|------------|
| <b>Tree</b>         |             |  |            |            |            |            |
|                     | ALRU2       | <i>Alnus rubra</i>                               | 50         | 0.2        | 0.2        | 0.2        |
| <b>Shrub</b>        |             |  |            |            |            |            |
|                     | MOCA6       | <i>Morella californica</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                     | RHOC        | <i>Rhododendron occidentale</i>                  | 50         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>         |             |  |            |            |            |            |
|                     | NULUP       | <i>Nuphar lutea</i> ssp. <i>polysepala</i>       | 100        | 39.0       | 28.0       | 50.0       |
|                     | HIVU2       | <i>Hippuris vulgaris</i>                         | 50         | 17.0       | 17.0       | 17.0       |
|                     | POPUP4      | <i>Polygonum punctatum</i> var. <i>punctatum</i> | 50         | 10.0       | 10.0       | 10.0       |
|                     | SOLAN       | <i>Solanum</i>                                   | 50         | 10.0       | 10.0       | 10.0       |
|                     | OESA        | <i>Oenanthе sarmentosa</i>                       | 50         | 2.0        | 2.0        | 2.0        |
|                     | ALLA2       | <i>Alisma lanceolatum</i>                        | 50         | 1.0        | 1.0        | 1.0        |
|                     | CABA4       | <i>Carex barbarae</i>                            | 50         | 1.0        | 1.0        | 1.0        |
|                     | PONA4       | <i>Potamogeton natans</i>                        | 50         | 1.0        | 1.0        | 1.0        |
|                     | RARE3       | <i>Ranunculus repens</i>                         | 50         | 1.0        | 1.0        | 1.0        |
|                     | ERGL11      | <i>Erechtites glomeratus</i>                     | 50         | 0.2        | 0.2        | 0.2        |
|                     | TYPHA       | <i>Typha</i>                                     | 50         | 0.2        | 0.2        | 0.2        |
|                     | CAOB3       | <i>Carex obnupta</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                     | ATFI        | <i>Athyrium filix-femina</i>                     | 50         | 0.2        | 0.2        | 0.2        |
|                     | TYLA        | <i>Typha latifolia</i>                           | 50         | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |  |            |            |            |            |
|                     | 2MOSS       | Moss   | 50         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Oenanthe sarmentosa* Alliance**

### **Water-parsley marsh**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Oenanthe sarmentosa* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Eleocharis macrostachya*, *Epilobium ciliatum*, *Festuca arundinacea*, *Galium triflorum*, *Holcus lanatus*, *Hydrocotyle ranunculoides*, *Lemna minuta*, *Rumex conglomeratus*, *Schoenoplectus pungens*, and *Typha latifolia*.

The species is common in freshwater and fresher brackish marshes, such as Southampton Marsh in Benicia, Contra Costa County. At Humboldt Bay National Refuge, the *Oenanthe sarmentosa* Alliance occurs in semi-permanently flooded freshwater to slightly brackish marshes, and stands may retain standing water through the summer (Pickart 2006). The alliance is little sampled and poorly understood across its range of British Columbia, California, Oregon, and Washington (Kagan et al. 2004, NatureServe 2007a). Although *Oenanthe sarmentosa* is found at inland sites, all stands of this alliance currently known in California occur close to the coast. Farther inland, as in Suisun Marsh (Keeler-Wolf and Vaghti 2000), *Oenanthe* tends to mix with *Schoenoplectus americanus* and becomes associated with that alliance.

### Sonoma County

Small stands of *Oenanthe sarmentosa* form on the fringes of ponds and lagoons near the immediate coast, as near the mouth of Salmon Creek in the southwestern portion of the County. These are associated with other wetland alliance stands such as *Hydrocotyle*, *Scirpus microcarpus*, and *Carex obnupta*. The single sampled stand was located in Laguna de Santa Rosa near Sebastopol.

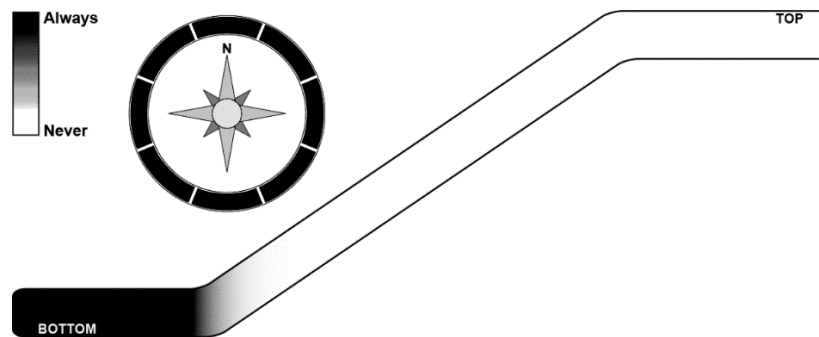
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### **Local Alliance Summary (n = 1)**

**Elevation:** 129 ft

**SCV Global/State Rank:** G4/S2??<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 100.0        | 100           | –          |
| <b>Herb</b>                          | 100.0        | 100           | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.2          | 0.2           | <0.5–0.5   |
| <b>Hardwood</b>                      | 0.2          | 0.2           | 10–15      |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 20.0% | 20%   |
| <b>Litter cover</b>      | 77.0% | 77%   |

**Associations within this Alliance:**

*Oenanthe sarmentosa* Association

**STAND TABLE**

***Oenanthe sarmentosa* Alliance**

n = 1

| Lifeform                               | Code   | Botanical Name                              | Con | Avg  | Min  | Max  |
|--|--------|---|-----|------|------|------|
| <b>Tree</b>                            |        |   |     |      |      |      |
|  | SALUL  | <i>Salix lucida</i> ssp. <i>lasiandra</i>   | 100 | 0.2  | 0.2  | 0.2  |
| <b>Regenerating or Understory Tree</b> |        |   |     |      |      |      |
|  | FRLA   | <i>Fraxinus latifolia</i>                   | 100 | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>                            |        |   |     |      |      |      |
|  | OESA   | <i>Oenanthe sarmentosa</i>                  | 100 | 90.0 | 90.0 | 90.0 |
|  | POLYG4 | <i>Polygonum</i>                            | 100 | 5.0  | 5.0  | 5.0  |
|  | 2FEAR3 | <i>Festuca arundinacea</i>                  | 100 | 2.0  | 2.0  | 2.0  |
|  | RUMEX  | <i>Rumex</i>                                | 100 | 2.0  | 2.0  | 2.0  |
|  | SOLID  | <i>Solidago</i>                             | 100 | 2.0  | 2.0  | 2.0  |
|  | ELMA5  | <i>Eleocharis macrostachya</i>              | 100 | 1.0  | 1.0  | 1.0  |
|  | HOLA   | <i>Holcus lanatus</i>                       | 100 | 1.0  | 1.0  | 1.0  |
|  | LETR5  | <i>Leymus triticoides</i>                   | 100 | 1.0  | 1.0  | 1.0  |
|  | ALISM  | <i>Alisma</i>                               | 100 | 0.2  | 0.2  | 0.2  |
|  | CIVU   | <i>Cirsium vulgare</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|  | EPILO  | <i>Epilobium</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|  | EQUIS  | <i>Equisetum</i>                            | 100 | 0.2  | 0.2  | 0.2  |
|  | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i> | 100 | 0.2  | 0.2  | 0.2  |
|  | SOAS   | <i>Sonchus asper</i>                        | 100 | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b>                    |        |   |     |      |      |      |
|  | 2LICHN | Lichen                                      | 100 | 0.2  | 0.2  | 0.2  |
|  | 2MOSS  | Moss  | 100 | 0.2  | 0.2  | 0.2  |

## ***Oenanthe sarmentosa* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 100.0               | 100                  | –                 |
| <b>Herb</b>                          | 100.0               | 100                  | 0.5–1             |
| <b>Shrub</b>                         | 0.0                 | 0                    | –                 |
| <b>Regenerating/understory tree*</b> | 0.2                 | 0.2                  | <0.5–0.5          |
| <b>Hardwood</b>                      | 0.2                 | 0.2                  | 10–15             |
| <b>Conifer</b>                       | 0.0                 | 0                    | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (1)

**Macrotopography:** bottom (1)

**Microtopography:** flat (1)

**Parent material:** sedimentary (1)

**Soil texture:** no data

**Slope steepness:** flat/0° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 129 ft.     | 129 ft.      |
| <b>Slope</b>             | 0.0°        | 0°           |
| <b>Large rock cover</b>  | 0.0%        | 0%           |
| <b>Small rock cover</b>  | 0.0%        | 0%           |
| <b>Bare ground cover</b> | 20.0%       | 20%          |
| <b>Litter cover</b>      | 77.0%       | 77%          |

### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** SONO0230

**SCV Global/State Rank:** G4?/S2?<sup>1</sup>

### **STAND TABLE**

#### ***Oenanthe sarmentosa* Association**

n = 1

| <b>Lifeform</b>                        | <b>Code</b> | <b>Botanical Name</b>                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|--|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>                            |             |   |            |            |            |            |
|  | SALUL       | <i>Salix lucida</i> ssp. <i>lasiandra</i> | 100        | 0.2        | 0.2        | 0.2        |
| <b>Regenerating or Understory Tree</b> |             |   |            |            |            |            |
|  | FRLA        | <i>Fraxinus latifolia</i>                 | 100        | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>                            |             |   |            |            |            |            |
|  | OESA        | <i>Oenanthe sarmentosa</i>                | 100        | 90.0       | 90.0       | 90.0       |
|  | POLYG4      | <i>Polygonum</i>                          | 100        | 5.0        | 5.0        | 5.0        |
|  | 2FEAR3      | <i>Festuca arundinacea</i>                | 100        | 2.0        | 2.0        | 2.0        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Oenanthe sarmentosa* Association**

n = 1

| <b>Lifeform</b>     | <b>Code</b> | <b>Botanical Name</b>                       | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|---------------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>         |             |   |            |            |            |            |
|                     | RUMEX       | <i>Rumex</i>                                | 100        | 2.0        | 2.0        | 2.0        |
|                     | SOLID       | <i>Solidago</i>                             | 100        | 2.0        | 2.0        | 2.0        |
|                     | LETR5       | <i>Leymus triticoides</i>                   | 100        | 1.0        | 1.0        | 1.0        |
|                     | HOLA        | <i>Holcus lanatus</i>                       | 100        | 1.0        | 1.0        | 1.0        |
|                     | ELMA5       | <i>Eleocharis macrostachya</i>              | 100        | 1.0        | 1.0        | 1.0        |
|                     | ALISM       | <i>Alisma</i>                               | 100        | 0.2        | 0.2        | 0.2        |
|                     | EPILO       | <i>Epilobium</i>                            | 100        | 0.2        | 0.2        | 0.2        |
|                     | EQUIS       | <i>Equisetum</i>                            | 100        | 0.2        | 0.2        | 0.2        |
|                     | JUEFP       | <i>Juncus effusus</i> var. <i>pacificus</i> | 100        | 0.2        | 0.2        | 0.2        |
|                     | SOAS        | <i>Sonchus asper</i>                        | 100        | 0.2        | 0.2        | 0.2        |
|                     | CIVU        | <i>Cirsium vulgare</i>                      | 100        | 0.2        | 0.2        | 0.2        |
| <b>Non-vascular</b> |             |   |            |            |            |            |
|                     | 2LICHN      | Lichen                                      | 100        | 0.2        | 0.2        | 0.2        |
|                     | 2MOSS       | Moss  | 100        | 0.2        | 0.2        | 0.2        |

***Persicaria lapathifolia* – *Xanthium strumarium* Provisional Alliance**  
**Smartweed – cocklebur patches**

Statewide (Sawyer et al. 2009)

*Persicaria lapathifolia*, *Xanthium strumarium* and/or other *Persicaria* spp. or semi-aquatic *Polygonum* spp. are dominant or co-dominant in the herbaceous layer with *Bidens frondosa*, *Cuscuta pentagona*, *Echinochloa* spp., *Eleocharis macrostachya*, *Euthamia occidentalis*, *Fallopia* spp., and *Phyla nodiflora*.

This alliance is characteristic of freshwater mudflats and seasonally flooded depressions which tend to demonstrate rapid draw-down or fluctuation of water levels. Stands occur at the margins of reservoirs and managed wetlands, or natural ponds and ox-bow lakes. The rapidly fluctuating water levels tend to foster the growth of the ruderal wetland species that characterize this alliance. The alliance concept is broad, and includes several species with similar life histories that are adapted to such situations.

Sonoma County

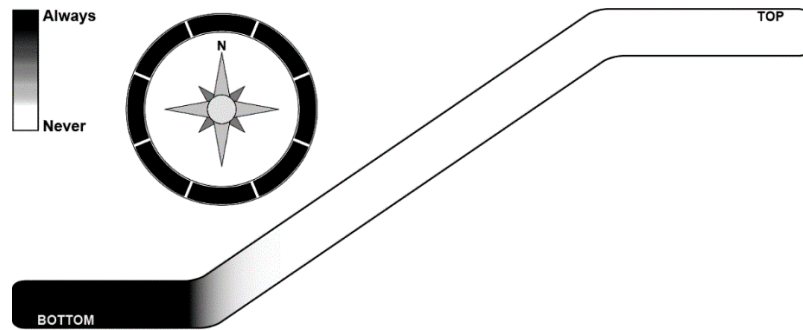
A single *Persicaria lapathifolia* – *Xanthium strumarium* stand, dominated by the aquatic ruderal *Bidens frondosa*, was sampled in the county.

**Local Alliance Summary (n = 1)**

**Elevation:** 62 ft

**SCV Global/State Rank:** G4/S4<sup>1</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 100.0        | 100           | –          |
| <b>Herb</b>                          | 100.0        | 100           | 1–2        |
| <b>Shrub</b>                         | 0.0          | 0             | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0             | –          |
| <b>Hardwood</b>                      | 0.0          | 0             | –          |
| <b>Conifer</b>                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 0.0°  | 0°    |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 0.0%  | 0%    |
| Bare ground cover | 5.0%  | 5%    |
| Litter cover      | 92.0% | 92%   |

**Associations within this Alliance:**

*Bidens frondosa* Provisional Association

**STAND TABLE**

*Persicaria lapathifolia* – *Xanthium strumarium* Provisional Alliance

n = 1

| Lifeform | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|-------|--------------------------------|-----|------|------|------|
| Herb     |       |                                |     |      |      |      |
|          | BIFR  | <i>Bidens frondosa</i>         | 100 | 95.0 | 95.0 | 95.0 |
|          | POPE2 | <i>Polygonum pensylvanicum</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | XAST  | <i>Xanthium strumarium</i>     | 100 | 2.0  | 2.0  | 2.0  |

***Bidens frondosa* Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 100.0        | 100           | –          |
| Herb                          | 100.0        | 100           | 1–2        |
| Shrub                         | 0.0          | 0             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (1)

**Macrotopography:** bottom (1)

**Microtopography:** flat (1)

**Parent material:** sedimentary (1)

**Soil texture:** no data

**Slope steepness:** flat/0° (1)

|                   | Mean   | Range  |
|-------------------|--------|--------|
| Elevation         | 62 ft. | 62 ft. |
| Slope             | 0.0°   | 0°     |
| Large rock cover  | 0.0%   | 0%     |
| Small rock cover  | 0.0%   | 0%     |
| Bare ground cover | 5.0%   | 5%     |
| Litter cover      | 92.0%  | 92%    |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0826

**Relevés:** none

**SCV Global/State Rank:** Not ranked because there are too few examples of this association in the state.

**STAND TABLE**

***Bidens frondosa* Provisional Association**

n = 1

| Lifeform | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|-------|--------------------------------|-----|------|------|------|
| Herb     |       |                                |     |      |      |      |
|          | BIFR  | <i>Bidens frondosa</i>         | 100 | 95.0 | 95.0 | 95.0 |
|          | POPE2 | <i>Polygonum pensylvanicum</i> | 100 | 3.0  | 3.0  | 3.0  |
|          | XAST  | <i>Xanthium strumarium</i>     | 100 | 2.0  | 2.0  | 2.0  |

***Phalaris aquatica* Semi-Natural Alliance**  
Harding grass swards

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Phalaris aquatica* is dominant in the herbaceous layer. *Phalaris arundinacea*, *Elytrigia pontica*, and other non-native grasses may be present or dominant. Scattered emergent shrubs may be present at low cover, including *Baccharis pilularis* or *Ceanothus cuneatus*.

Stands of *Phalaris aquatica* have invaded many inland settings, especially grasslands with past disturbance (such as clearing) or from nearby intentional plantings. *P. aquatica* forms dense patches that prevent the germination of other species (Silveira 2000). Native species richness drops because of a thick surface litter and thatch build-up. In wetlands, land managers plant *Phalaris aquatica* for waterfowl food (Silveira 2000). Other *Phalaris* species are less invasive, but locally found in wildlands: *P. arundinacea*, *P. brachystachys*, *P. canariensis*, *P. caroliniana*, *P. minor*, and *P. paradoxa*. See DiTomaso and Healy (2007) for details.

Sonoma County

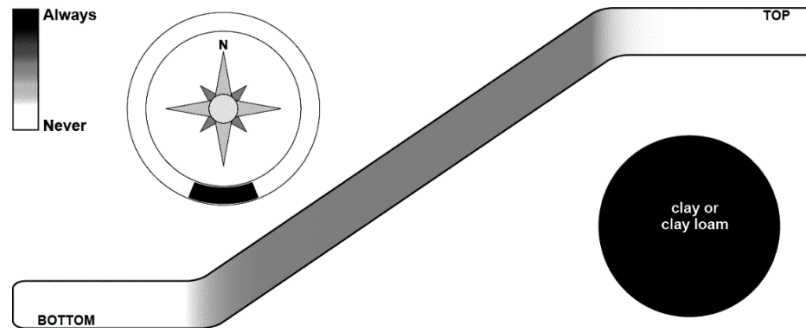
Two *Phalaris aquatica* stands have been sampled in the county. Both are associated with pasture lands and were probably introduced intentionally as cattle forage.

**Local Alliance Summary (n = 2)**

**Elevation:** 679–1455 ft, mean 1067 ft

**SCV Global/State Rank:** Not ranked – semi-natural alliance

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 79.5         | 60–99         | –          |
| <b>Herb</b>                          | 79.5         | 60–99         | 0.5–1      |
| <b>Shrub</b>                         | 0.5          | 0–1           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

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**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 9.0°  | 4–14°  |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.5%  | 0–1%   |
| Bare ground cover | 2.0%  | 1–3%   |
| Litter cover      | 92.0% | 91–93% |

**Associations within this Alliance:**

*Phalaris aquatica* Provisional Semi-Natural Association

**STAND TABLE**

***Phalaris aquatica* Semi-Natural Alliance**

n = 2

| Lifeform | Code   | Botanical Name                               | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Shrub    | BAPI   | <i>Baccharis pilularis</i>                   | 50  | 0.2  | 0.2  | 0.2  |
| Herb     | PHAQ   | <i>Phalaris aquatica</i>                     | 100 | 48.5 | 38.0 | 59.0 |
|          | ANAR   | <i>Anagallis arvensis</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|          | GEDI   | <i>Geranium dissectum</i>                    | 100 | 0.2  | 0.2  | 0.2  |
|          | LASE   | <i>Lactuca serriola</i>                      | 100 | 0.2  | 0.2  | 0.2  |
|          | VISA   | <i>Vicia sativa</i>                          | 100 | 0.2  | 0.2  | 0.2  |
|          | CAPY2  | <i>Carduus pycnocephalus</i>                 | 50  | 68.0 | 68.0 | 68.0 |
|          | AVBA   | <i>Avena barbata</i>                         | 50  | 3.0  | 3.0  | 3.0  |
|          | DACA3  | <i>Danthonia californica</i>                 | 50  | 3.0  | 3.0  | 3.0  |
|          | GADI   | <i>Galium divaricatum</i>                    | 50  | 3.0  | 3.0  | 3.0  |
|          | RUPU3  | <i>Rumex pulcher</i>                         | 50  | 3.0  | 3.0  | 3.0  |
|          | VUBR   | <i>Vulpia bromoides</i>                      | 50  | 3.0  | 3.0  | 3.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                     | 50  | 1.0  | 1.0  | 1.0  |
|          | AICA   | <i>Aira caryophyllea</i>                     | 50  | 0.2  | 0.2  | 0.2  |
|          | AMSIN  | <i>Amsinckia</i>                             | 50  | 0.2  | 0.2  | 0.2  |
|          | BRMA   | <i>Briza maxima</i>                          | 50  | 0.2  | 0.2  | 0.2  |
|          | BRMI2  | <i>Briza minor</i>                           | 50  | 0.2  | 0.2  | 0.2  |
|          | BRDI3  | <i>Bromus diandrus</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|          | CAREX  | <i>Carex</i>                                 | 50  | 0.2  | 0.2  | 0.2  |
|          | CEGL2  | <i>Cerastium glomeratum</i>                  | 50  | 0.2  | 0.2  | 0.2  |
|          | CIVU   | <i>Cirsium vulgare</i>                       | 50  | 0.2  | 0.2  | 0.2  |
|          | CRSE11 | <i>Croton setigerus</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | EPBR3  | <i>Epilobium brachycarpum</i>                | 50  | 0.2  | 0.2  | 0.2  |
|          | GERAN  | <i>Geranium</i>                              | 50  | 0.2  | 0.2  | 0.2  |
|          | HOMUL  | <i>Hordeum murinum</i> ssp. <i>leporinum</i> | 50  | 0.2  | 0.2  | 0.2  |
|          | HYGL2  | <i>Hypochaeris glabra</i>                    | 50  | 0.2  | 0.2  | 0.2  |
|          | HYRA3  | <i>Hypochaeris radicata</i>                  | 50  | 0.2  | 0.2  | 0.2  |
|          | JUTE   | <i>Juncus tenuis</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|          | LOPE   | <i>Lolium perenne</i>                        | 50  | 0.2  | 0.2  | 0.2  |
|          | MEPO3  | <i>Medicago polymorpha</i>                   | 50  | 0.2  | 0.2  | 0.2  |
|          | RUAC3  | <i>Rumex acetosella</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | RUCR   | <i>Rumex crispus</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|          | SIMA3  | <i>Silybum marianum</i>                      | 50  | 0.2  | 0.2  | 0.2  |
|          | SOAS   | <i>Sonchus asper</i>                         | 50  | 0.2  | 0.2  | 0.2  |
|          | SOOL   | <i>Sonchus oleraceus</i>                     | 50  | 0.2  | 0.2  | 0.2  |



**STAND TABLE** continued

***Phalaris aquatica* Semi-Natural Alliance**

n = 2

| Lifeform | Code  | Botanical Name                    | Con | Avg | Min | Max |
|----------|-------|-----------------------------------|-----|-----|-----|-----|
| Herb     |       |                                   |     |     |     |     |
|          | TACA8 | <i>Taeniatherum caput-medusae</i> | 50  | 0.2 | 0.2 | 0.2 |
|          | TRDU2 | <i>Trifolium dubium</i>           | 50  | 0.2 | 0.2 | 0.2 |
|          | VERBA | <i>Verbascum</i>                  | 50  | 0.2 | 0.2 | 0.2 |
|          | VITE  | <i>Vicia tetrasperma</i>          | 50  | 0.2 | 0.2 | 0.2 |

***Phalaris aquatica* Provisional Semi-Natural Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Central Franciscan/M261Bb (1) and Coastal Franciscan/263Ag (1) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 79.5         | 60–99         | –          |
| Herb                          | 79.5         | 60–99         | 0.5–1      |
| Shrub                         | 0.5          | 0–1           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** SE (1), SW (1)

**Macrotopography:** lower to middle 1/3 of slope (1), upper 1/3 of slope (1)

**Microtopography:** undulating (2)

**Parent material:** Franciscan melange (1), metasedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1), moderate/6-25° (1)

|                   | Mean     | Range        |
|-------------------|----------|--------------|
| Elevation         | 1067 ft. | 679–1455 ft. |
| Slope             | 9.0°     | 4–14°        |
| Large rock cover  | 0.0%     | 0–0%         |
| Small rock cover  | 0.5%     | 0–1%         |
| Bare ground cover | 2.0%     | 1–3%         |
| Litter cover      | 92.0%    | 91–93%       |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** none

**Relevés:** HEAD0192, SONO0930

**SCV Global/State Rank:** Not ranked – semi-natural association.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**STAND TABLE**

***Phalaris aquatica* Provisional Semi-Natural Association**

n = 2

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Shrub</b>    | BAPI        | <i>Baccharis pilularis</i>                   | 50         | 0.2        | 0.2        | 0.2        |
| <b>Herb</b>     | PHAQ        | <i>Phalaris aquatica</i>                     | 100        | 48.5       | 38.0       | 59.0       |
|                 | GEDI        | <i>Geranium dissectum</i>                    | 100        | 0.2        | 0.2        | 0.2        |
|                 | LASE        | <i>Lactuca serriola</i>                      | 100        | 0.2        | 0.2        | 0.2        |
|                 | VISA        | <i>Vicia sativa</i>                          | 100        | 0.2        | 0.2        | 0.2        |
|                 | ANAR        | <i>Anagallis arvensis</i>                    | 100        | 0.2        | 0.2        | 0.2        |
|                 | CAPY2       | <i>Carduus pycnocephalus</i>                 | 50         | 68.0       | 68.0       | 68.0       |
|                 | RUPU3       | <i>Rumex pulcher</i>                         | 50         | 3.0        | 3.0        | 3.0        |
|                 | AVBA        | <i>Avena barbata</i>                         | 50         | 3.0        | 3.0        | 3.0        |
|                 | VUBR        | <i>Vulpia bromoides</i>                      | 50         | 3.0        | 3.0        | 3.0        |
|                 | DACA3       | <i>Danthonia californica</i>                 | 50         | 3.0        | 3.0        | 3.0        |
|                 | GADI        | <i>Galium divaricatum</i>                    | 50         | 3.0        | 3.0        | 3.0        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                     | 50         | 1.0        | 1.0        | 1.0        |
|                 | LOPE        | <i>Lolium perenne</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                 | VERBA       | <i>Verbascum</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                 | AMSIN       | <i>Amsinckia</i>                             | 50         | 0.2        | 0.2        | 0.2        |
|                 | TRDU2       | <i>Trifolium dubium</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|                 | VITE        | <i>Vicia tetrasperma</i>                     | 50         | 0.2        | 0.2        | 0.2        |
|                 | TACA8       | <i>Taeniatherum caput-medusae</i>            | 50         | 0.2        | 0.2        | 0.2        |
|                 | SOOL        | <i>Sonchus oleraceus</i>                     | 50         | 0.2        | 0.2        | 0.2        |
|                 | SOAS        | <i>Sonchus asper</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|                 | SIMA3       | <i>Silybum marianum</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|                 | RUCR        | <i>Rumex crispus</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|                 | RUAC3       | <i>Rumex acetosella</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|                 | MEPO3       | <i>Medicago polymorpha</i>                   | 50         | 0.2        | 0.2        | 0.2        |
|                 | JUTE        | <i>Juncus tenuis</i>                         | 50         | 0.2        | 0.2        | 0.2        |
|                 | HYRA3       | <i>Hypochaeris radicata</i>                  | 50         | 0.2        | 0.2        | 0.2        |
|                 | HYGL2       | <i>Hypochaeris glabra</i>                    | 50         | 0.2        | 0.2        | 0.2        |
|                 | HOMUL       | <i>Hordeum murinum</i> ssp. <i>leporinum</i> | 50         | 0.2        | 0.2        | 0.2        |
|                 | GERAN       | <i>Geranium</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|                 | EPBR3       | <i>Epilobium brachycarpum</i>                | 50         | 0.2        | 0.2        | 0.2        |
|                 | CRSE11      | <i>Croton setigerus</i>                      | 50         | 0.2        | 0.2        | 0.2        |
|                 | CIVU        | <i>Cirsium vulgare</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                 | CEGL2       | <i>Cerastium glomeratum</i>                  | 50         | 0.2        | 0.2        | 0.2        |
|                 | BRMA        | <i>Briza maxima</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                 | AICA        | <i>Aira caryophyllea</i>                     | 50         | 0.2        | 0.2        | 0.2        |
|                 | BRMI2       | <i>Briza minor</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                 | BRDI3       | <i>Bromus diandrus</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                 | CAREX       | <i>Carex</i>                                 | 50         | 0.2        | 0.2        | 0.2        |

***Plagiobothrys nothofulvus* Alliance**  
**Popcorn flower fields**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Plagiobothrys nothofulvus* is characteristically present or dominant in the herbaceous layer with *Amsinckia menziesii*, *Avena* spp., *Bromus* spp., *Calochortus luteus*, *Castilleja attenuata*, *Castilleja exserta*, *Clarkia* spp., *Daucus pusillus*, *Dichelostemma capitatum*, *Erodium* spp., *Eschscholzia californica*, *Eschscholzia lobbii*, *Holocarpha virgata*, *Hordeum murinum*, *Lasthenia californica*, *Lotus* spp., *Lupinus* spp., *Phacelia ramosissima*, *Plagiobothrys collinus*, *Plagiobothrys fulvus*, and *Trifolium* spp. Emergent shrubs may be present at low cover.

Stands are widespread and seasonally abundant in upland annual grasslands on the Central Coast, in the Sierra Nevada foothills, and elsewhere where grazing, fire, and other disturbances are moderately frequent. Stands radically shift in appearance and size, depending primarily on the amount and timing of precipitation from year to year. Annual grasses such as *Bromus hordeaceus* mask native plants such as *Plagiobothrys nothofulvus* in some years (Bartolome et al. 2007a).

Stands of *Plagiobothrys* spp. form a distinctive component of the native California annual herbaceous vegetation and range from relatively high rainfall areas in the North Coast to semi-desert edges in southern California. Ecologically, the *Plagiobothrys nothofulvus* Alliance is most similar to the *Amsinckia (menziesii, tessellata)* Alliance, but tolerates less soil disturbance. Popcorn flower fields occur in relatively well drained, deeper soils compared to *Eschscholzia* spp. or *Lupinus* spp. (on shallower or steeper soils), or *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance (on very shallow or nutrient-poor soils).

Sonoma County

A few small *Plagiobothrys nothofulvus* stands were sampled in open herbaceous areas on moderate to steep slopes in the interior portion of the county (Austin Creek State Recreation Area, Sugarloaf Mountain State Park). These were on upper convex slopes.

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**Local Alliance Summary (n = 2)**

**Elevation:** 2657–2729 ft, mean 2693 ft

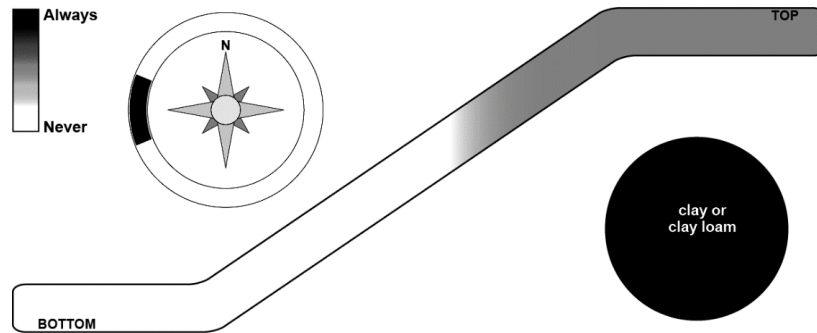
**SCV Global/State Rank:** G4/S4<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 20.5         | 20–21         | –          |
| <b>Herb</b>                          | 20.5         | 20–21         | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 10.0° | 7–13°  |
| <b>Large rock cover</b>  | 0.1%  | 0–0.2% |
| <b>Small rock cover</b>  | 28.1% | 6–50%  |
| <b>Bare ground cover</b> | 26.5% | 13–40% |
| <b>Litter cover</b>      | 42.5% | 35–50% |

**Associations within this Alliance:**

*Plagiobothrys nothofulvus* – *Daucus pusillus* – *Trifolium microcephalum* Provisional Association

**STAND TABLE**

***Plagiobothrys nothofulvus* Alliance**

n = 2

| Lifeform | Code   | Botanical Name                                       | Con | Avg | Min | Max  |
|----------|--------|--|-----|-----|-----|------|
| Herb     | PLNO   | <i>Plagiobothrys nothofulvus</i>                     | 100 | 9.5 | 7.0 | 12.0 |
|          | ERCI6  | <i>Erodium cicutarium</i>                            | 100 | 2.5 | 2.0 | 3.0  |
|          | AVBA   | <i>Avena barbata</i>                                 | 100 | 2.0 | 2.0 | 2.0  |
|          | BRMA3  | <i>Bromus madritensis</i>                            | 100 | 2.0 | 1.0 | 3.0  |
|          | BRDI3  | <i>Bromus diandrus</i>                               | 100 | 1.5 | 1.0 | 2.0  |
|          | BRHO2  | <i>Bromus hordeaceus</i>                             | 100 | 1.5 | 1.0 | 2.0  |
|          | ERNU3  | <i>Eriogonum nudum</i>                               | 100 | 0.6 | 0.2 | 1.0  |
|          | ESCA2  | <i>Eschscholzia californica</i>                      | 100 | 0.6 | 0.2 | 1.0  |
|          | CRFL4  | <i>Cryptantha flaccida</i>                           | 100 | 0.2 | 0.2 | 0.2  |
|          | DICAC5 | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 100 | 0.2 | 0.2 | 0.2  |
|          | LUBI   | <i>Lupinus bicolor</i>                               | 100 | 0.2 | 0.2 | 0.2  |
|          | MEBU   | <i>Melica bulbosa</i>                                | 100 | 0.2 | 0.2 | 0.2  |

**STAND TABLE** continued

***Plagiobothrys nothofulvus* Alliance**

n = 2

| Lifeform | Code  | Botanical Name                 | Con | Avg | Min | Max |
|----------|-------|--------------------------------|-----|-----|-----|-----|
| Herb     |       |                                |     |     |     |     |
|          | PEDU2 | <i>Petrorhagia dubia</i>       | 100 | 0.2 | 0.2 | 0.2 |
|          | PHCA  | <i>Phacelia californica</i>    | 50  | 1.0 | 1.0 | 1.0 |
|          | AMTE3 | <i>Amsinckia tessellata</i>    | 50  | 0.2 | 0.2 | 0.2 |
|          | EPCA3 | <i>Epilobium canum</i>         | 50  | 0.2 | 0.2 | 0.2 |
|          | ERBO  | <i>Erodium botrys</i>          | 50  | 0.2 | 0.2 | 0.2 |
|          | HYRA3 | <i>Hypochaeris radicata</i>    | 50  | 0.2 | 0.2 | 0.2 |
|          | LODA  | <i>Lomatium dasycarpum</i>     | 50  | 0.2 | 0.2 | 0.2 |
|          | SHAR2 | <i>Sherardia arvensis</i>      | 50  | 0.2 | 0.2 | 0.2 |
|          | THCU  | <i>Thysanocarpus curvipes</i>  | 50  | 0.2 | 0.2 | 0.2 |
|          | TRMI4 | <i>Trifolium microcephalum</i> | 50  | 0.2 | 0.2 | 0.2 |
|          | TRWI3 | <i>Trifolium willdenovii</i>   | 50  | 0.2 | 0.2 | 0.2 |

***Plagiobothrys nothofulvus* – *Daucus pusillus* – *Trifolium microcephalum*  
Provisional Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 20.5         | 20–21         | –          |
| Herb                          | 20.5         | 20–21         | 0.5–1      |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** NW (2)

**Macrotopography:** ridge top (1), upper 1/3 of slope (1)

**Microtopography:** convex (2)

**Parent material:** Franciscan melange (2)

**Soil texture:** clay or clay loam (2)

**Slope steepness:** moderate/6-25° (2)

|                   | Mean     | Range         |
|-------------------|----------|---------------|
| Elevation         | 2693 ft. | 2657–2729 ft. |
| Slope             | 10.0°    | 7–13°         |
| Large rock cover  | 0.1%     | 0–0.2%        |
| Small rock cover  | 28.1%    | 6–50%         |
| Bare ground cover | 26.5%    | 13–40%        |
| Litter cover      | 42.5%    | 35–50%        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Samples Used to Describe Association** (n=2)

**Rapid Assessments:** none

**Relevés:** SONO0522, SONO0523

**SCV Global/State Rank:** G3G4?/S3S4?<sup>1</sup>

**STAND TABLE**

***Plagiobothrys nothofulvus* – *Daucus pusillus* – *Trifolium microcephalum* Provisional Association**

n = 2

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | PLNO        | <i>Plagiobothrys nothofulvus</i>                     | 100        | 9.5        | 7.0        | 12.0       |
|                 | ERCI6       | <i>Erodium cicutarium</i>                            | 100        | 2.5        | 2.0        | 3.0        |
|                 | AVBA        | <i>Avena barbata</i>                                 | 100        | 2.0        | 2.0        | 2.0        |
|                 | BRMA3       | <i>Bromus madritensis</i>                            | 100        | 2.0        | 1.0        | 3.0        |
|                 | BRDI3       | <i>Bromus diandrus</i>                               | 100        | 1.5        | 1.0        | 2.0        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                             | 100        | 1.5        | 1.0        | 2.0        |
|                 | ERNU3       | <i>Eriogonum nudum</i>                               | 100        | 0.6        | 0.2        | 1.0        |
|                 | ESCA2       | <i>Eschscholzia californica</i>                      | 100        | 0.6        | 0.2        | 1.0        |
|                 | PEDU2       | <i>Petrorhagia dubia</i>                             | 100        | 0.2        | 0.2        | 0.2        |
|                 | CRFL4       | <i>Cryptantha flaccida</i>                           | 100        | 0.2        | 0.2        | 0.2        |
|                 | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 100        | 0.2        | 0.2        | 0.2        |
|                 | LUBI        | <i>Lupinus bicolor</i>                               | 100        | 0.2        | 0.2        | 0.2        |
|                 | MEBU        | <i>Melica bulbosa</i>                                | 100        | 0.2        | 0.2        | 0.2        |
|                 | PHCA        | <i>Phacelia californica</i>                          | 50         | 1.0        | 1.0        | 1.0        |
|                 | AMTE3       | <i>Amsinckia tessellata</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                 | EPCA3       | <i>Epilobium canum</i>                               | 50         | 0.2        | 0.2        | 0.2        |
|                 | ERBO        | <i>Erodium botrys</i>                                | 50         | 0.2        | 0.2        | 0.2        |
|                 | HYRA3       | <i>Hypochaeris radicata</i>                          | 50         | 0.2        | 0.2        | 0.2        |
|                 | LODA        | <i>Lomatium dasycarpum</i>                           | 50         | 0.2        | 0.2        | 0.2        |
|                 | SHAR2       | <i>Sherardia arvensis</i>                            | 50         | 0.2        | 0.2        | 0.2        |
|                 | THCU        | <i>Thysanocarpus curvipes</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                 | TRMI4       | <i>Trifolium microcephalum</i>                       | 50         | 0.2        | 0.2        | 0.2        |
|                 | TRWI3       | <i>Trifolium willdenovii</i>                         | 50         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Sarcocornia pacifica* (*Salicornia depressa*) Alliance**

### **Pickleweed mats**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Salicornia depressa* or *Sarcocornia pacifica* is dominant or co-dominant in the subshrub and herbaceous layers with algae and *Atriplex patula*, *Atriplex prostrata*, *Batis maritima*, *Bolboschoenus maritimus*, *Cotula coronopifolia*, *Crypsis schoenoides*, *Cuscuta salina*, *Distichlis spicata*, *Echinochloa crus-galli*, *Frankenia salina*, *Grindelia stricta*, *Jaumea carnosa*, *Juncus* spp., *Lepidium latifolium*, *Limonium californicum*, *Monanthochloe littoralis*, *Persicaria lapathifolia*, *Sesuvium verrucosum*, *Spartina foliosa*, *Suaeda esteroa*, *Suaeda taxifolia*, *Triglochin maritima*, and *Xanthium strumarium*.

In northern California, *Sarcocornia pacifica* co-dominates with *Cuscuta salina* in the high marsh zone, slightly above the zones dominated by the non-native grass *Spartina densiflora*. In central California, *Sarcocornia pacifica* dominates in high- and mid-marsh zones above the zones dominated by the native grass *Spartina foliosa*. In southern California, Zedler et al. (1999) stated that elevation profiles and vegetation patterns do not have discrete zonation, but they recognize three habitats: high marsh, marsh plain, and cordgrass habitat. In the high marsh, *Sarcocornia pacifica* is associated with *Arthrocnemum subterminale* and *Cuscuta salina*; the marsh plain is dominated by *Batis maritima*, *Distichlis spicata*, *Monanthochloe littoralis*, and *Sarcocornia pacifica*. General descriptions are found in Grewell et al. (2007).

### Sonoma County

*Sarcocornia pacifica* is the principle dominant in all *Sarcocornia pacifica* (*Salicornia depressa*) Alliance stands sampled in the county. Most stands occur in the inland areas of the county, adjacent to San Pablo Bay or the tidal portions of Petaluma Creek. Stands also occur on the coast, as at Bodega Bay and Estero Americano. In some stands, *Sarcocornia pacifica* co-dominates with *Grindelia stricta*, and though these stands are visually distinctive, they are still considered members of the *Sarcocornia pacifica* (*Salicornia depressa*) Alliance.

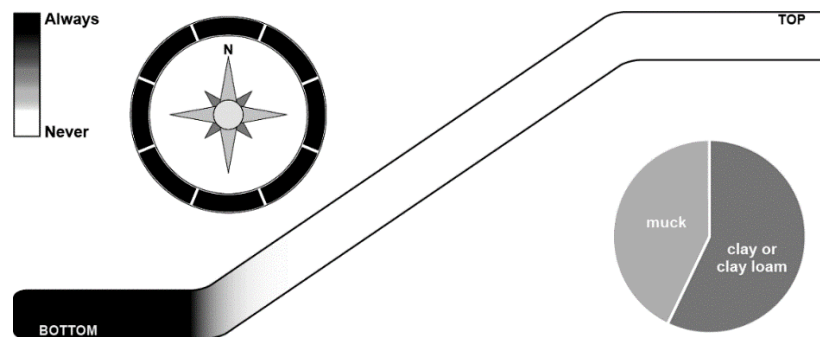
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### **Local Alliance Summary (n = 11)**

**Elevation:** 0–8 ft, mean 4 ft

**SCV Global/State Rank:** G4/S3<sup>2</sup>

### **Observed Aspect, Topographic Slope Position, and Soil Texture**



<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 54.2         | 35–75         | –          |
| Herb                          | 54.2         | 35–75         | <0.5–1     |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range |
|-------------------|-------|-------|
| Slope             | 0.1°  | 0–1°  |
| Large rock cover  | 0.0%  | 0–0%  |
| Small rock cover  | 0.0%  | 0–0%  |
| Bare ground cover | 45.5% | 0–95% |
| Litter cover      | 38.5% | 2–97% |

**Associations within this Alliance:**

*Sarcocornia pacifica* – *Jaumea carnosa* – *Distichlis spicata* Association

*Sarcocornia pacifica* – *Lepidium latifolium* Association

*Sarcocornia pacifica* Association

**STAND TABLE**

***Sarcocornia pacifica* (*Salicornia depressa*) Alliance**

n = 11

| Lifeform | Code   | Botanical Name              | Con | Avg  | Min | Max  |
|----------|--------|-----------------------------|-----|------|-----|------|
| Herb     |        |                             |     |      |     |      |
|          | SAPA30 | <i>Sarcocornia pacifica</i> | 91  | 41.4 | 5.0 | 66.0 |
|          | JACA4  | <i>Jaumea carnosa</i>       | 36  | 11.4 | 0.2 | 44.0 |
|          | FRSA   | <i>Frankenia salina</i>     | 36  | 3.6  | 0.2 | 8.0  |
|          | DISP   | <i>Distichlis spicata</i>   | 27  | 3.4  | 0.2 | 9.0  |
|          | ATPR   | <i>Atriplex prostrata</i>   | 27  | 0.2  | 0.2 | 0.2  |

***Sarcocornia pacifica* – *Jaumea carnosa* – *Distichlis spicata* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 65.0         | 65            | –          |
| Herb                          | 65.0         | 65            | <0.5–0.5   |
| Shrub                         | 0.0          | 0             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings



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**Summary of Environmental Data**

**Aspect:** flat (1)  
**Macrotopography:** bottom (1)  
**Microtopography:** flat (1)  
**Parent material:** sedimentary (1)  
**Soil texture:** muck (1)  
**Slope steepness:** flat/0° (1)

|                   | Mean  | Range |
|-------------------|-------|-------|
| Elevation         | 5 ft. | 5 ft. |
| Slope             | 0.0°  | 0°    |
| Large rock cover  | 0.0%  | 0%    |
| Small rock cover  | 0.0%  | 0%    |
| Bare ground cover | 64.0% | 64%   |
| Litter cover      | 4.0%  | 4%    |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO0378

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Sarcocornia pacifica* – *Jaumea carnosa* – *Distichlis spicata* Association**

n = 1

| Lifeform | Code   | Botanical Name              | Con | Avg  | Min  | Max  |
|----------|--------|-----------------------------|-----|------|------|------|
| Herb     | JACA4  | <i>Jaumea carnosa</i>       | 100 | 44.0 | 44.0 | 44.0 |
|          | SAPA30 | <i>Sarcocornia pacifica</i> | 100 | 12.0 | 12.0 | 12.0 |
|          | DISP   | <i>Distichlis spicata</i>   | 100 | 9.0  | 9.0  | 9.0  |
|          | FRSA   | <i>Frankenia salina</i>     | 100 | 0.2  | 0.2  | 0.2  |

***Sarcocornia pacifica* – *Lepidium latifolium* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 43.0         | 43            | –          |
| Herb                          | 43.0         | 43            | 0.5–1      |
| Shrub                         | 0.0          | 0             | –          |
| Regenerating/understory tree* | 0.0          | 0             | –          |
| Hardwood                      | 0.0          | 0             | –          |
| Conifer                       | 0.0          | 0             | –          |

\*Includes seedlings and saplings

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Summary of Environmental Data**

**Aspect:** flat (1)  
**Macrotopography:** bottom (1)  
**Microtopography:** flat (1)  
**Parent material:** mixed alluvium (1)  
**Soil texture:** no data  
**Slope steepness:** flat/0° (1)

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Elevation</b>         | 3 ft. | 3 ft. |
| <b>Slope</b>             | 0.0°  | 0°    |
| <b>Large rock cover</b>  | 0.0%  | 0%    |
| <b>Small rock cover</b>  | 0.0%  | 0%    |
| <b>Bare ground cover</b> | 43.0% | 43%   |
| <b>Litter cover</b>      | 55.0% | 55%   |

**Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none  
**Relevés:** SONO0672

**SCV Global/State Rank:** G3?/S3?¹

**STAND TABLE**

***Sarcocornia pacifica* – *Lepidium latifolium* Association**

n = 1

| Lifeform | Code   | Botanical Name              | Con | Avg  | Min  | Max  |
|----------|--------|-----------------------------|-----|------|------|------|
| Herb     | SAPA30 | <i>Sarcocornia pacifica</i> | 100 | 43.0 | 43.0 | 43.0 |
|          | LELA2  | <i>Lepidium latifolium</i>  | 100 | 25.0 | 25.0 | 25.0 |
|          | GRST3  | <i>Grindelia stricta</i>    | 100 | 0.2  | 0.2  | 0.2  |

***Sarcocornia pacifica* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (8) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 55.4         | 35–75         | –          |
| <b>Herb</b>                          | 55.4         | 35–75         | <0.5–1     |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

¹ Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Environmental Data**

**Aspect:** flat (8)

**Macrotopography:** bottom (8)

**Microtopography:** concave (1), flat (6), undulating (1)

**Parent material:** clayey alluvium (1), mixed alluvium (2), sandy alluvium (2), sedimentary (2), silty alluvium (1)

**Soil texture:** clay or clay loam (3), muck (2)

**Slope steepness:** flat/0° (7), gentle/1-5° (1)

|                          | Mean  | Range   |
|--------------------------|-------|---------|
| <b>Elevation</b>         | 4 ft. | 0–8 ft. |
| <b>Slope</b>             | 0.1°  | 0–1°    |
| <b>Large rock cover</b>  | 0.0%  | 0–0%    |
| <b>Small rock cover</b>  | 0.0%  | 0–0%    |
| <b>Bare ground cover</b> | 45.0% | 0–95%   |
| <b>Litter cover</b>      | 38.8% | 2–97%   |

**Samples Used to Describe Association (n=8)**

**Rapid Assessments:** none

**Relevés:** SONO0119, SONO0280, SONO0376, SONO0422, SONO0425, SONO0429, SONO0647, SONO0665

**SCV Global/State Rank:** G4/S3<sup>1</sup>

**STAND TABLE**

***Sarcocornia pacifica* Association**

n = 8

| Lifeform | Code   | Botanical Name                 | Con | Avg  | Min  | Max  |
|----------|--------|--------------------------------|-----|------|------|------|
| Herb     | SAPA30 | <i>Sarcocornia pacifica</i>    | 88  | 50.6 | 35.0 | 66.0 |
|          | ATPR   | <i>Atriplex prostrata</i>      | 38  | 0.2  | 0.2  | 0.2  |
|          | FRSA   | <i>Frankenia salina</i>        | 25  | 4.1  | 0.2  | 8.0  |
|          | DISP   | <i>Distichlis spicata</i>      | 25  | 0.6  | 0.2  | 1.0  |
|          | JACA4  | <i>Jaumea carnosa</i>          | 25  | 0.2  | 0.2  | 0.2  |
|          | BOMA7  | <i>Bolboschoenus maritimus</i> | 25  | 0.2  | 0.2  | 0.2  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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## ***Schoenoplectus acutus* Alliance**

### **Hardstem bulrush marsh**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Schoenoplectus acutus* is dominant or co-dominant in the herbaceous layer with *Azolla filiculoides*, *Calystegia sepium*, *Eichhornia crassipes*, *Hibiscus lasiocarpus*, *Hoita macrostachya*, *Hydrocotyle ranunculoides*, *Leersia oryzoides*, *Ludwigia peploides*, *Lycopus americanus*, *Phragmites australis*, *Schoenoplectus californicus*, *Sparganium eurycarpum*, *Triglochin* spp., *Typha angustifolia*, *Typha latifolia*, and *Urtica dioica*. Emergent trees and shrubs may be present at low cover, including trees: *Alnus rhombifolia*, *Populus fremontii*, or *Salix gooddingii*, and shrubs: *Cephalanthus occidentalis*, *Rubus armeniacus*, *Salix exigua*, or *Salix lasiolepis*.

The alliance is a widespread, freshwater to slightly brackish marsh type, typical of marshes throughout much of North America (NatureServe 2007a). *Schoenoplectus acutus* is less tolerant of brackish conditions than is *Schoenoplectus californicus*, and this alliance is not found regularly on the edges of large stretches of open water (Grewell et al. 2007). Mixed stands of *Schoenoplectus acutus* and *S. californicus* are placed in the *Schoenoplectus californicus* Alliance. This decision was based on analysis and interpretation of a large data set, including data from Suisun Marsh (Keeler-Wolf and Vaghti 2000) and the Sacramento–San Joaquin River Delta (Hickson and Keeler-Wolf 2007).

#### Sonoma County

All *Schoenoplectus acutus* stands sampled locally are associated with small lakes and ponds in the interior of the county.

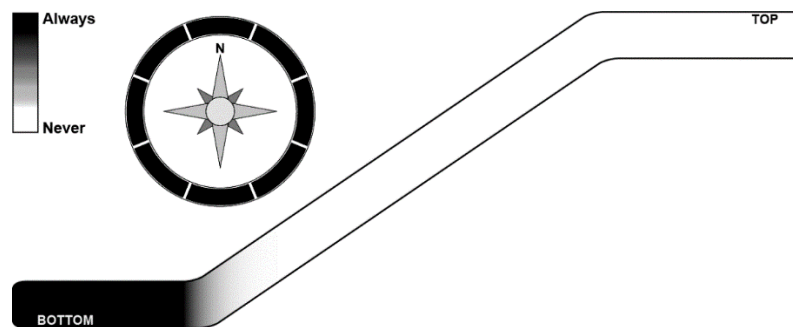
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#### **Local Alliance Summary (n = 4)**

**Elevation:** 0–1591 ft, mean 416 ft

**SCV Global/State Rank:** G5/S4<sup>2</sup>

#### **Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 44.8         | 14–100        | –          |
| <b>Herb</b>                          | 44.8         | 14–100        | 1–5        |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0–0°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 0.0%  | 0–0%  |
| <b>Bare ground cover</b> | 4.8%  | 0–10% |
| <b>Litter cover</b>      | 48.0% | 0–93% |

**Associations within this Alliance:**

*Schoenoplectus acutus* Association

**STAND TABLE**

***Schoenoplectus acutus* Alliance**

n = 4

| Lifeform | Code   | Botanical Name                                 | Con | Avg  | Min  | Max  |
|----------|--------|--|-----|------|------|------|
| Herb     | SCAC3  | <i>Schoenoplectus acutus</i>                   | 75  | 49.3 | 19.0 | 90.0 |
|          | TYLA   | <i>Typha latifolia</i>                         | 50  | 2.0  | 1.0  | 3.0  |
|          | SCHOE6 | <i>Schoenoplectus</i>                          | 25  | 14.0 | 14.0 | 14.0 |
|          | SPEU   | <i>Sparganium eurycarpum</i>                   | 25  | 10.0 | 10.0 | 10.0 |
|          | URDI   | <i>Urtica dioica</i>                           | 25  | 4.0  | 4.0  | 4.0  |
|          | DRAR3  | <i>Dryopteris arguta</i>                       | 25  | 1.0  | 1.0  | 1.0  |
|          | AGROS2 | <i>Agrostis</i>                                | 25  | 0.2  | 0.2  | 0.2  |
|          | ARDO3  | <i>Artemisia douglasiana</i>                   | 25  | 0.2  | 0.2  | 0.2  |
|          | ATPR   | <i>Atriplex prostrata</i>                      | 25  | 0.2  | 0.2  | 0.2  |
|          | COAR4  | <i>Convolvulus arvensis</i>                    | 25  | 0.2  | 0.2  | 0.2  |
|          | EPTO4  | <i>Epilobium torreyi</i>                       | 25  | 0.2  | 0.2  | 0.2  |
|          | EQTEB  | <i>Equisetum telmateia</i> var. <i>braunii</i> | 25  | 0.2  | 0.2  | 0.2  |
|          | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>    | 25  | 0.2  | 0.2  | 0.2  |
|          | JUPH   | <i>Juncus phaeocephalus</i>                    | 25  | 0.2  | 0.2  | 0.2  |
|          | LASE   | <i>Lactuca serriola</i>                        | 25  | 0.2  | 0.2  | 0.2  |
|          | LELA2  | <i>Lepidium latifolium</i>                     | 25  | 0.2  | 0.2  | 0.2  |
|          | RASA2  | <i>Raphanus sativus</i>                        | 25  | 0.2  | 0.2  | 0.2  |
|          | RUCR   | <i>Rumex crispus</i>                           | 25  | 0.2  | 0.2  | 0.2  |
|          | SCCA11 | <i>Schoenoplectus californicus</i>             | 25  | 0.2  | 0.2  | 0.2  |
|          | TYPHA  | <i>Typha</i>                                   | 25  | 0.2  | 0.2  | 0.2  |
|          | TYDO   | <i>Typha domingensis</i>                       | 25  | 0.2  | 0.2  | 0.2  |

## ***Schoenoplectus acutus* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (3) USDA Ecological Subsections (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 44.8                | 14–100               | –                 |
| <b>Herb</b>                          | 44.8                | 14–100               | 1–5               |
| <b>Shrub</b>                         | 0.0                 | 0–0                  | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (4)

**Macrotopography:** bottom (4)

**Microtopography:** flat (3), undulating (1)

**Parent material:** mixed alluvium (2), sedimentary (1), volcanic (1)

**Soil texture:** no data

**Slope steepness:** flat/0° (4)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 416 ft.     | 0–1591 ft.   |
| <b>Slope</b>             | 0.0°        | 0–0°         |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 0.0%        | 0–0%         |
| <b>Bare ground cover</b> | 4.8%        | 0–10%        |
| <b>Litter cover</b>      | 48.0%       | 0–93%        |

### **Samples Used to Describe Association (n=4)**

**Rapid Assessments:** SONO0233, SONO0321, SONO0374

**Relevés:** SONO0648

**SCV Global/State Rank:** G5/S4<sup>1</sup>

### **STAND TABLE**

#### ***Schoenoplectus acutus* Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                              |            |            |            |            |
|                 | SCAC3       | <i>Schoenoplectus acutus</i> | 75         | 49.3       | 19.0       | 90.0       |
|                 | TYLA        | <i>Typha latifolia</i>       | 50         | 2.0        | 1.0        | 3.0        |
|                 | SCHOE6      | <i>Schoenoplectus</i>        | 25         | 14.0       | 14.0       | 14.0       |
|                 | SPEU        | <i>Sparganium eurycarpum</i> | 25         | 10.0       | 10.0       | 10.0       |
|                 | URDI        | <i>Urtica dioica</i>         | 25         | 4.0        | 4.0        | 4.0        |
|                 | DRAR3       | <i>Dryopteris arguta</i>     | 25         | 1.0        | 1.0        | 1.0        |
|                 | JUPH        | <i>Juncus phaeocephalus</i>  | 25         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Schoenoplectus acutus* Association**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | AGROS2      | <i>Agrostis</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | ATPR        | <i>Atriplex prostrata</i>                      | 25         | 0.2        | 0.2        | 0.2        |
|                 | EPTO4       | <i>Epilobium torreyi</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | JUEFP       | <i>Juncus effusus</i> var. <i>pacificus</i>    | 25         | 0.2        | 0.2        | 0.2        |
|                 | ARDO3       | <i>Artemisia douglasiana</i>                   | 25         | 0.2        | 0.2        | 0.2        |
|                 | LASE        | <i>Lactuca serriola</i>                        | 25         | 0.2        | 0.2        | 0.2        |
|                 | LELA2       | <i>Lepidium latifolium</i>                     | 25         | 0.2        | 0.2        | 0.2        |
|                 | RASA2       | <i>Raphanus sativus</i>                        | 25         | 0.2        | 0.2        | 0.2        |
|                 | RUCR        | <i>Rumex crispus</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                 | SCCA11      | <i>Schoenoplectus californicus</i>             | 25         | 0.2        | 0.2        | 0.2        |
|                 | TYPHA       | <i>Typha</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                 | TYDO        | <i>Typha domingensis</i>                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | EQTEB       | <i>Equisetum telmateia</i> var. <i>braunii</i> | 25         | 0.2        | 0.2        | 0.2        |
|                 | COAR4       | <i>Convolvulus arvensis</i>                    | 25         | 0.2        | 0.2        | 0.2        |

***Schoenoplectus californicus* Alliance**  
**California bulrush marsh**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Schoenoplectus californicus* is dominant or co-dominant in the herbaceous layer with *Apocynum cannabinum*, *Bolboschoenus maritimus*, *Eichhornia crassipes*, *Euthamia occidentalis*, *Ludwigia peploides*, *Persicaria punctata*, *Phragmites australis*, *Schoenoplectus acutus*, *Typha angustifolia*, *Typha domingensis*, and *Typha latifolia*. Emergent shrubs may be present at low cover, including *Cephalanthus occidentalis*, *Rosa californica*, or *Salix lasiolepis*.

The alliance is a widespread emergent marsh type. Although *Schoenoplectus acutus* and *S. californicus* commonly occur in the same area, *Schoenoplectus californicus* tends to dominate on the outer, more exposed edges of marshes adjacent to open water, and appears to be more tolerant of brackish water than *S. acutus*. Mixed stands of *Schoenoplectus acutus* and *S. californicus* are placed in this alliance based on analysis and interpretation of a large data set, including data from Suisun Marsh (Keeler-Wolf and Vaghti 2000) and the Sacramento–San Joaquin River Delta (Hickson and Keeler-Wolf 2007).

Sonoma County

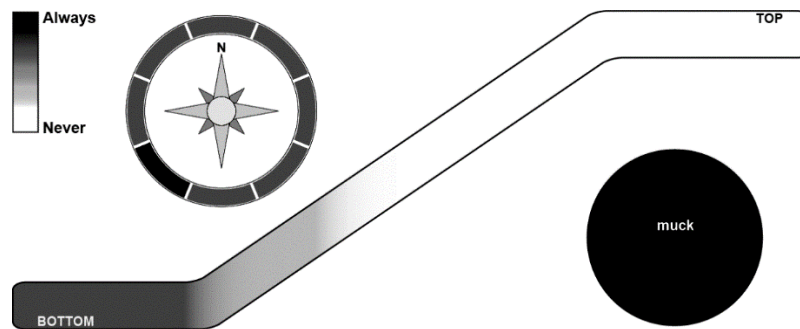
Stands of the *Schoenoplectus californicus* Alliance are restricted to the edges of open water, as at Petaluma Creek near Petaluma Marsh. Most of these stands appear to be strongly dominated by *S. californicus*.

**Local Alliance Summary (n = 3)**

**Elevation:** 233–2074 ft, mean 1163 ft

**SCV Global/State Rank:** G5/S4?<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 70.0         | 45–95         | –          |
| <b>Herb</b>             | 70.0         | 45–95         | 2–5        |
| <b>Shrub</b>            | 0.0          | 0–0           | –          |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.3          | 0–1           | 2–5        |
| Hardwood                      | 0.3          | 0–1           | 5–10       |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 0.3°  | 0–1°   |
| Large rock cover  | 0.1%  | 0–0.2% |
| Small rock cover  | 0.1%  | 0–0.2% |
| Bare ground cover | 58.0% | 0–93%  |
| Litter cover      | 29.3% | 3–70%  |

**Associations within this Alliance:**

*Schoenoplectus californicus* Association

**STAND TABLE**

***Schoenoplectus californicus* Alliance**

n = 3

| Lifeform | Code   | Botanical Name                            | Con | Avg  | Min  | Max  |
|----------|--------|---|-----|------|------|------|
| Tree     |        |   |     |      |      |      |
|          | SALUL  | <i>Salix lucida</i> ssp. <i>lasiandra</i> | 33  | 1.0  | 1.0  | 1.0  |
| Shrub    |        |   |     |      |      |      |
|          | SALA6  | <i>Salix lasiolepis</i>                   | 33  | 1.0  | 1.0  | 1.0  |
| Herb     |        |   |     |      |      |      |
|          | SCCA11 | <i>Schoenoplectus californicus</i>        | 100 | 53.3 | 20.0 | 95.0 |
|          | AZFI   | <i>Azolla filiculoides</i>                | 33  | 60.0 | 60.0 | 60.0 |
|          | POLYG4 | <i>Polygonum</i>                          | 33  | 0.2  | 0.2  | 0.2  |

***Schoenoplectus californicus* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (1) and Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsections (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Total vegetation              | 70.0         | 45–95         | –          |
| Herb                          | 70.0         | 45–95         | 2–5        |
| Shrub                         | 0.0          | 0–0           | –          |
| Regenerating/understory tree* | 0.3          | 0–1           | 2–5        |
| Hardwood                      | 0.3          | 0–1           | 5–10       |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2), SW (1)

**Macrotopography:** bottom (2), lower 1/3 of slope (1)

**Microtopography:** flat (3)

**Parent material:** sandstone (1), volcanic (2)

**Summary of Environmental Data, continued**

**Soil texture:** muck (1)

**Slope steepness:** flat/0° (2), gentle/1-5° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 1163 ft.    | 233–2074 ft. |
| <b>Slope</b>             | 0.3°        | 0–1°         |
| <b>Large rock cover</b>  | 0.1%        | 0–0.2%       |
| <b>Small rock cover</b>  | 0.1%        | 0–0.2%       |
| <b>Bare ground cover</b> | 58.0%       | 0–93%        |
| <b>Litter cover</b>      | 29.3%       | 3–70%        |

**Samples Used to Describe Association (n=3)**

**Rapid Assessments:** SONO0637

**Relevés:** SONO0331, SONO0369

**SCV Global/State Rank:** G4?/S3?<sup>1</sup>

**STAND TABLE**

***Schoenoplectus californicus* Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                     | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Tree</b>     |             |   |            |            |            |            |
|                 | SALUL       | <i>Salix lucida</i> ssp. <i>lasiandra</i> | 33         | 1.0        | 1.0        | 1.0        |
| <b>Shrub</b>    |             |   |            |            |            |            |
|                 | SALA6       | <i>Salix lasiolepis</i>                   | 33         | 1.0        | 1.0        | 1.0        |
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | SCCA11      | <i>Schoenoplectus californicus</i>        | 100        | 53.3       | 20.0       | 95.0       |
|                 | AZFI        | <i>Azolla filiculoides</i>                | 33         | 60.0       | 60.0       | 60.0       |
|                 | POLYG4      | <i>Polygonum</i>                          | 33         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

***Scirpus microcarpus* Alliance**  
**Small-fruited bulrush marsh**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Scirpus microcarpus* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Carex* spp., *Epilobium* spp., *Geum macrophyllum*, *Glyceria elata*, *Holcus lanatus*, *Oenanthe sarmentosa*, *Oxypolis occidentalis*, *Rumex conglomeratus*, *Scirpus congdonii*, and *Viola macloskeyi*.

*Scirpus microcarpus* occurs in many wetlands throughout California and it can be a common understory component of riparian forests. The National Vegetation Classification (NatureServe 2007a) also notes the *Scirpus microcarpus* Alliance from British Columbia, Oregon, and Washington. Potter (2005) considered *Scirpus microcarpus* and *S. congdonii* to be ecological equivalents and he placed them in a bulrush alliance; they are treated as the *Scirpus microcarpus* – *Scirpus congdonii* Association here.

Sonoma County

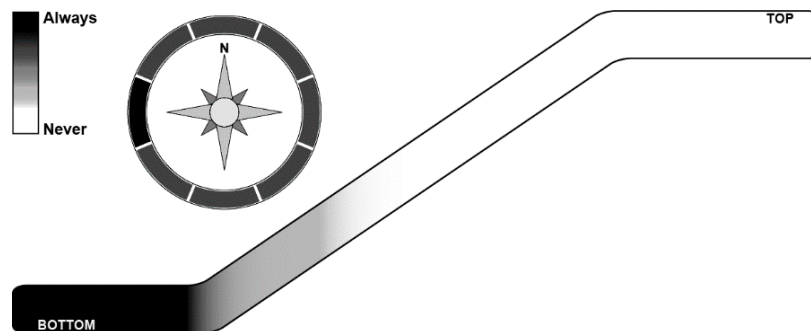
Locally, *Scirpus microcarpus* stands are associated with cool water marshes or seeps near the coast. In the moisture gradient of these sites, *Scirpus microcarpus* tends to dominate the sites that are permanently wet but without long-standing water. This separates *Scirpus microcarpus* stands from *Oenanthe sarmentosa* Alliance stands, which can tolerate standing water, and *Carex obnupta* Alliance stands, which tend to tolerate drying conditions later in the growing season.

**Local Alliance Summary (n = 3)**

**Elevation:** 11–37 ft, mean 24 ft

**SCV Global/State Rank:** G4/S2<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                         | Mean % Cover | Range % Cover | Height (m) |
|-------------------------|--------------|---------------|------------|
| <b>Total vegetation</b> | 60.0         | 44–81         | –          |
| <b>Herb</b>             | 58.3         | 44–81         | 0.5–2      |
| <b>Shrub</b>            | 1.4          | 0–4           | 1–2        |

<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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|                               | Mean % Cover | Range % Cover | Height (m) |
|-------------------------------|--------------|---------------|------------|
| Regenerating/understory tree* | 0.0          | 0–0           | –          |
| Hardwood                      | 0.0          | 0–0           | –          |
| Conifer                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

Summary of Environmental Data

|                   | Mean  | Range  |
|-------------------|-------|--------|
| Slope             | 0.3°  | 0–1°   |
| Large rock cover  | 0.0%  | 0–0%   |
| Small rock cover  | 0.0%  | 0–0%   |
| Bare ground cover | 3.3%  | 1–8%   |
| Litter cover      | 88.0% | 80–96% |

Associations within this Alliance:

*Scirpus microcarpus* Association

**STAND TABLE**

*Scirpus microcarpus* Alliance

n = 3

| Lifeform     | Code   | Botanical Name                                      | Con | Avg  | Min  | Max  |
|--------------|--------|---|-----|------|------|------|
| <b>Shrub</b> |        |   |     |      |      |      |
|              | RUUR   | <i>Rubus ursinus</i>                                | 33  | 3.0  | 3.0  | 3.0  |
|              | BAPI   | <i>Baccharis pilularis</i>                          | 33  | 1.0  | 1.0  | 1.0  |
|              | LOINL  | <i>Lonicera involucrata</i> var. <i>ledebourii</i>  | 33  | 0.2  | 0.2  | 0.2  |
|              | RIBES  | <i>Ribes</i>  | 33  | 0.2  | 0.2  | 0.2  |
|              | RUSP   | <i>Rubus spectabilis</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|              | TODI   | <i>Toxicodendron diversilobum</i>                   | 33  | 0.2  | 0.2  | 0.2  |
| <b>Herb</b>  |        |   |     |      |      |      |
|              | SCMI2  | <i>Scirpus microcarpus</i>                          | 100 | 49.3 | 38.0 | 70.0 |
|              | COMA2  | <i>Conium maculatum</i>                             | 67  | 2.0  | 1.0  | 3.0  |
|              | OESA   | <i>Oenanthe sarmentosa</i>                          | 67  | 0.2  | 0.2  | 0.2  |
|              | HEMA80 | <i>Heracleum maximum</i>                            | 33  | 11.0 | 11.0 | 11.0 |
|              | URDI   | <i>Urtica dioica</i>                                | 33  | 10.0 | 10.0 | 10.0 |
|              | LAVE2  | <i>Lathyrus vestitus</i>                            | 33  | 6.0  | 6.0  | 6.0  |
|              | BADO   | <i>Baccharis douglasii</i>                          | 33  | 5.0  | 5.0  | 5.0  |
|              | POGLG4 | <i>Potentilla glandulosa</i> ssp. <i>glandulosa</i> | 33  | 4.0  | 4.0  | 4.0  |
|              | JULE   | <i>Juncus lesueurii</i>                             | 33  | 2.0  | 2.0  | 2.0  |
|              | ATFI   | <i>Athyrium filix-femina</i>                        | 33  | 1.0  | 1.0  | 1.0  |
|              | CAOB3  | <i>Carex obnupta</i>                                | 33  | 1.0  | 1.0  | 1.0  |
|              | JUPA2  | <i>Juncus patens</i>                                | 33  | 1.0  | 1.0  | 1.0  |
|              | BRRAR  | <i>Brassica rapa</i> var. <i>rapa</i>               | 33  | 0.2  | 0.2  | 0.2  |
|              | EQHY   | <i>Equisetum hyemale</i>                            | 33  | 0.2  | 0.2  | 0.2  |
|              | EQTEB  | <i>Equisetum telmateia</i> var. <i>braunii</i>      | 33  | 0.2  | 0.2  | 0.2  |
|              | GAAP2  | <i>Galium aparine</i>                               | 33  | 0.2  | 0.2  | 0.2  |
|              | JUNCU  | <i>Juncus</i>                                       | 33  | 0.2  | 0.2  | 0.2  |
|              | JUEFP  | <i>Juncus effusus</i> var. <i>pacificus</i>         | 33  | 0.2  | 0.2  | 0.2  |
|              | VITE   | <i>Vicia tetrasperma</i>                            | 33  | 0.2  | 0.2  | 0.2  |

## ***Scirpus microcarpus* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Hills-Santa Rosa Plain/263Aj (3) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 60.0                | 44–81                | –                 |
| <b>Herb</b>                          | 58.3                | 44–81                | 0.5–2             |
| <b>Shrub</b>                         | 1.4                 | 0–4                  | 1–2               |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0–0                  | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0–0                  | –                 |
| <b>Conifer</b>                       | 0.0                 | 0–0                  | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (2), SW (1)

**Macrotopography:** bottom (2), bottom to lower 1/3 of slope (1)

**Microtopography:** concave (1), flat (2)

**Parent material:** sedimentary (3)

**Soil texture:** muck (2), sand (1)

**Slope steepness:** flat/0° (2), gentle/1–5° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 24 ft.      | 11–37 ft.    |
| <b>Slope</b>             | 0.3°        | 0–1°         |
| <b>Large rock cover</b>  | 0.0%        | 0–0%         |
| <b>Small rock cover</b>  | 0.0%        | 0–0%         |
| <b>Bare ground cover</b> | 3.3%        | 1–8%         |
| <b>Litter cover</b>      | 88.0%       | 80–96%       |

### **Samples Used to Describe Association (n=3)**

**Rapid Assessments:** none

**Relevés:** SONO0030, SONO0392, SONO0395

**SCV Global/State Rank:** G4/S3<sup>1</sup>

### **STAND TABLE**

#### ***Scirpus microcarpus* Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                              | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Shrub</b>    |             |  |            |            |            |            |
|                 | RUUR        | <i>Rubus ursinus</i>                               | 33         | 3.0        | 3.0        | 3.0        |
|                 | BAPI        | <i>Baccharis pilularis</i>                         | 33         | 1.0        | 1.0        | 1.0        |
|                 | RIBES       | <i>Ribes</i>                                       | 33         | 0.2        | 0.2        | 0.2        |
|                 | RUSP        | <i>Rubus spectabilis</i>                           | 33         | 0.2        | 0.2        | 0.2        |
|                 | TODI        | <i>Toxicodendron diversilobum</i>                  | 33         | 0.2        | 0.2        | 0.2        |
|                 | LOINL       | <i>Lonicera involucrata</i> var. <i>ledebourii</i> | 33         | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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**STAND TABLE** continued

***Scirpus microcarpus* Association**

n = 3

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                               | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|---|------------|------------|------------|------------|
| <b>Herb</b>     |             |   |            |            |            |            |
|                 | SCMI2       | <i>Scirpus microcarpus</i>                          | 100        | 49.3       | 38.0       | 70.0       |
|                 | COMA2       | <i>Conium maculatum</i>                             | 67         | 2.0        | 1.0        | 3.0        |
|                 | OESA        | <i>Oenanthe sarmentosa</i>                          | 67         | 0.2        | 0.2        | 0.2        |
|                 | HEMA80      | <i>Heracleum maximum</i>                            | 33         | 11.0       | 11.0       | 11.0       |
|                 | URDI        | <i>Urtica dioica</i>                                | 33         | 10.0       | 10.0       | 10.0       |
|                 | LAVE2       | <i>Lathyrus vestitus</i>                            | 33         | 6.0        | 6.0        | 6.0        |
|                 | BADO        | <i>Baccharis douglasii</i>                          | 33         | 5.0        | 5.0        | 5.0        |
|                 | POGLG4      | <i>Potentilla glandulosa</i> ssp. <i>glandulosa</i> | 33         | 4.0        | 4.0        | 4.0        |
|                 | JULE        | <i>Juncus lesueurii</i>                             | 33         | 2.0        | 2.0        | 2.0        |
|                 | ATFI        | <i>Athyrium filix-femina</i>                        | 33         | 1.0        | 1.0        | 1.0        |
|                 | CAOB3       | <i>Carex obnupta</i>                                | 33         | 1.0        | 1.0        | 1.0        |
|                 | JUPA2       | <i>Juncus patens</i>                                | 33         | 1.0        | 1.0        | 1.0        |
|                 | EQTEB       | <i>Equisetum telmateia</i> var. <i>braunii</i>      | 33         | 0.2        | 0.2        | 0.2        |
|                 | VITE        | <i>Vicia tetrasperma</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | JUEFP       | <i>Juncus effusus</i> var. <i>pacificus</i>         | 33         | 0.2        | 0.2        | 0.2        |
|                 | GAAP2       | <i>Galium aparine</i>                               | 33         | 0.2        | 0.2        | 0.2        |
|                 | EQHY        | <i>Equisetum hyemale</i>                            | 33         | 0.2        | 0.2        | 0.2        |
|                 | BRRAR       | <i>Brassica rapa</i> var. <i>rapa</i>               | 33         | 0.2        | 0.2        | 0.2        |
|                 | JUNCU       | <i>Juncus</i>                                       | 33         | 0.2        | 0.2        | 0.2        |

## ***Selaginella wallacei* Alliance**

### **Wallace's spikemoss mats**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Selaginella wallacei* is dominant or conspicuous as rhizomatous mats in the herbaceous layer with *Aira caryophyllea*, *Avena barbata*, *Bromus diandrus*, *Bromus rubens*, *Corethrogyne filaginifolia*, *Logfia filaginoides*, *Melica imperfecta*, *Mirabilis laevis* var. *crassifolia*, *Plantago erecta*, and *Vulpia microstachys*. Emergent shrubs may be present at low cover, including *Adenostoma fasciculatum*, *Artemisia californica*, *Ceanothus crassifolius*, *Diplacus aurantiacus*, *Eriogonum fasciculatum*, *Eriogonum wrightii*, or *Hesperoyucca whipplei*.

The *Selaginella wallacei* Alliance is characteristic of outcrops in much of cismontane California. It typically occurs on gently to moderately sloping slabs of rock and, over time, may form thick mats of intertwined roots and rhizomes. The alliance is widespread in southern California, including the Channel Islands and Baja California. Surveys come from inland San Diego County north to San Benito County. In the northern Sierra Nevada foothills, Klein et al. (2007) placed stands with high cover of *Selaginella hansenii* in the *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance. The relationships between *Selaginella*-dominated and annual herb-dominated vegetation can be better understood with further sampling in the southern foothills and other parts of California. The *Selaginella* (*tortipila*, *rupestris*) Alliance exists in the southeastern United States (NatureServe 2007a).

#### Sonoma County

The largest *Selaginella wallacei* stands known from the county are barely 0.5 ha and were sampled among large rock outcrops in the interior of the county, from Austin Creek Recreation Area to the Lake Sonoma area. Most outcrops in this area are metamorphic, but it is possible that *Selaginella wallacei* stands also exist on volcanic or serpentine outcrops. They exist in a matrix of other small edaphically determined alliance stands including the *Lasthenia californica* – *Plantago erecta* – *Vulpia microstachys* Alliance, *Sedum spathulifolium* Provisional Alliance, and *Mimulus guttatus* Alliance stands (localized on rocky seeps). Mapping difficulties may arise in these instances and it is likely the *Selaginella wallacei* Alliance will be mapped as part of the Central California Coast Ranges Cliff and Canyon Group.

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#### **Local Alliance Summary (n = 4)**

**Elevation:** 441–1879 ft, mean 913 ft

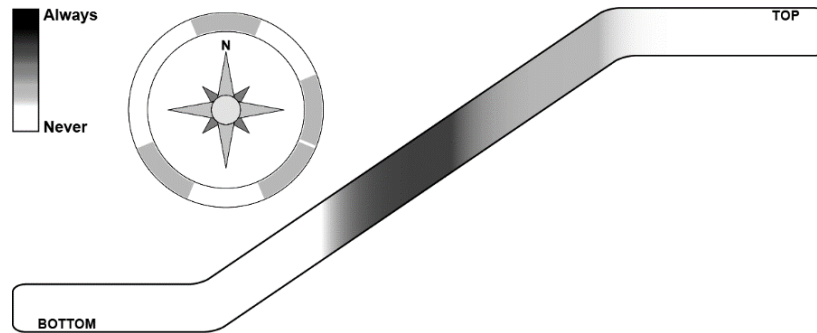
**SCV Global/State Rank:** G4/S3<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 18.3         | 6–38          | –          |
| <b>Herb</b>                          | 17.5         | 6–38          | <0.5–0.5   |
| <b>Shrub</b>                         | 0.6          | 0.2–1         | 0.5–1      |
| <b>Regenerating/understory tree*</b> | 0.8          | 0–3           | 2–5        |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 41.8° | 29–58° |
| <b>Large rock cover</b>  | 60.0% | 45–83% |
| <b>Small rock cover</b>  | 21.8% | 7–28%  |
| <b>Bare ground cover</b> | 11.3% | 3–25%  |
| <b>Litter cover</b>      | 5.8%  | 1–15%  |

**Associations within this Alliance:** none

**STAND TABLE**

***Selaginella wallacei* Alliance**

n = 4

| Lifeform                               | Code  | Botanical Name                                      | Con | Avg  | Min | Max  |
|--|-------|---|-----|------|-----|------|
| <b>Regenerating or Understory Tree</b> |       |   |     |      |     |      |
|  | QUAG  | <i>Quercus agrifolia</i>                            | 25  | 3.0  | 3.0 | 3.0  |
| <b>Shrub</b>                           |       |   |     |      |     |      |
|  | ADFA  | <i>Adenostoma fasciculatum</i>                      | 50  | 0.2  | 0.2 | 0.2  |
|  | DIAUA | <i>Diplacus aurantiacus</i> ssp. <i>aurantiacus</i> | 50  | 0.2  | 0.2 | 0.2  |
|  | TODI  | <i>Toxicodendron diversilobum</i>                   | 50  | 0.2  | 0.2 | 0.2  |
|  | HODI  | <i>Holodiscus discolor</i>                          | 25  | 1.0  | 1.0 | 1.0  |
|  | LUAR  | <i>Lupinus arboreus</i>                             | 25  | 1.0  | 1.0 | 1.0  |
|  | CECU  | <i>Ceanothus cuneatus</i>                           | 25  | 0.2  | 0.2 | 0.2  |
|  | HEAR5 | <i>Heteromeles arbutifolia</i>                      | 25  | 0.2  | 0.2 | 0.2  |
|  | KECO2 | <i>Keckiella corymbosa</i>                          | 25  | 0.2  | 0.2 | 0.2  |
|  | LOSC2 | <i>Lotus scoparius</i>                              | 25  | 0.2  | 0.2 | 0.2  |
|  | RHCR  | <i>Rhamnus crocea</i>                               | 25  | 0.2  | 0.2 | 0.2  |
| <b>Herb</b>                            |       |   |     |      |     |      |
|  | SEWA  | <i>Selaginella wallacei</i>                         | 100 | 13.0 | 4.0 | 35.0 |



Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Selaginella wallacei* Alliance**

n = 4

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>                                | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--|------------|------------|------------|------------|
| <b>Herb</b>     |             |  |            |            |            |            |
|                 | EPCA3       | <i>Epilobium canum</i>                               | 50         | 2.5        | 1.0        | 4.0        |
|                 | BRMA3       | <i>Bromus madritensis</i>                            | 50         | 1.6        | 0.2        | 3.0        |
|                 | ERNU3       | <i>Eriogonum nudum</i>                               | 50         | 1.1        | 0.2        | 2.0        |
|                 | PETR7       | <i>Pentagramma triangularis</i>                      | 50         | 0.6        | 0.2        | 1.0        |
|                 | AICA        | <i>Aira caryophylla</i>                              | 50         | 0.2        | 0.2        | 0.2        |
|                 | DICAC5      | <i>Dichelostemma capitatum</i> ssp. <i>capitatum</i> | 50         | 0.2        | 0.2        | 0.2        |
|                 | GALIU       | <i>Galium</i>  | 50         | 0.2        | 0.2        | 0.2        |
|                 | THCU        | <i>Thysanocarpus curvipes</i>                        | 50         | 0.2        | 0.2        | 0.2        |
|                 | MIGU        | <i>Mimulus guttatus</i>                              | 25         | 8.0        | 8.0        | 8.0        |
|                 | SAME7       | <i>Saxifraga mertensiana</i>                         | 25         | 3.0        | 3.0        | 3.0        |
|                 | BRHO2       | <i>Bromus hordeaceus</i>                             | 25         | 2.0        | 2.0        | 2.0        |
|                 | MIDO3       | <i>Minuartia douglasii</i>                           | 25         | 2.0        | 2.0        | 2.0        |
|                 | COSP        | <i>Collinsia sparsiflora</i>                         | 25         | 1.0        | 1.0        | 1.0        |
|                 | PEMU        | <i>Pellaea mucronata</i>                             | 25         | 1.0        | 1.0        | 1.0        |
|                 | PEDU2       | <i>Petrorhagia dubia</i>                             | 25         | 1.0        | 1.0        | 1.0        |
|                 | PLNO        | <i>Plagiobothrys nothofulvus</i>                     | 25         | 1.0        | 1.0        | 1.0        |
|                 | PLECT       | <i>Plectritis</i>                                    | 25         | 1.0        | 1.0        | 1.0        |
|                 | PSEUD4      | <i>Pseudognaphalium</i>                              | 25         | 1.0        | 1.0        | 1.0        |
|                 | TOAR        | <i>Torilis arvensis</i>                              | 25         | 1.0        | 1.0        | 1.0        |
|                 | VUMI        | <i>Vulpia microstachys</i>                           | 25         | 1.0        | 1.0        | 1.0        |
|                 | ATPU        | <i>Athysanus pusillus</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | AVENA       | <i>Avena</i>   | 25         | 0.2        | 0.2        | 0.2        |
|                 | AVBA        | <i>Avena barbata</i>                                 | 25         | 0.2        | 0.2        | 0.2        |
|                 | BRDI3       | <i>Bromus diandrus</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|                 | CAOL        | <i>Cardamine oligosperma</i>                         | 25         | 0.2        | 0.2        | 0.2        |
|                 | CLARK       | <i>Clarkia</i>                                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | DENU        | <i>Delphinium nudicaule</i>                          | 25         | 0.2        | 0.2        | 0.2        |
|                 | DUDLE       | <i>Dudleya</i>                                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | DUFA        | <i>Dudleya farinosa</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | EPMI        | <i>Epilobium minutum</i>                             | 25         | 0.2        | 0.2        | 0.2        |
|                 | ERCI6       | <i>Erodium cicutarium</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | FESTU       | <i>Festuca</i>                                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | GAAP2       | <i>Galium aparine</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | GAPA5       | <i>Galium parisiense</i>                             | 25         | 0.2        | 0.2        | 0.2        |
|                 | GIAC2       | <i>Gilia achilleifolia</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                 | HYGL2       | <i>Hypochaeris glabra</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | LAAU        | <i>Lamarckia aurea</i>                               | 25         | 0.2        | 0.2        | 0.2        |
|                 | LEBI8       | <i>Leptosiphon bicolor</i>                           | 25         | 0.2        | 0.2        | 0.2        |
|                 | LOCA19      | <i>Logfia californica</i>                            | 25         | 0.2        | 0.2        | 0.2        |
|                 | LOGA2       | <i>Logfia gallica</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | LOHU2       | <i>Lotus humistratus</i>                             | 25         | 0.2        | 0.2        | 0.2        |
|                 | LUPIN       | <i>Lupinus</i>                                       | 25         | 0.2        | 0.2        | 0.2        |
|                 | MEBU        | <i>Melica bulbosa</i>                                | 25         | 0.2        | 0.2        | 0.2        |
|                 | NAPU4       | <i>Nassella pulchra</i>                              | 25         | 0.2        | 0.2        | 0.2        |
|                 | PEAN2       | <i>Pellaea andromedifolia</i>                        | 25         | 0.2        | 0.2        | 0.2        |
|                 | PETRO       | <i>Petrorhagia</i>                                   | 25         | 0.2        | 0.2        | 0.2        |
|                 | PHCA        | <i>Phacelia californica</i>                          | 25         | 0.2        | 0.2        | 0.2        |

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
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**STAND TABLE** continued

***Selaginella wallacei* Alliance**

n = 4

| Lifeform            | Code   | Botanical Name                  | Con | Avg  | Min  | Max  |
|---------------------|--------|---------------------------------|-----|------|------|------|
| <b>Herb</b>         |        |                                 |     |      |      |      |
|                     | PLCA5  | <i>Platystemon californicus</i> | 25  | 0.2  | 0.2  | 0.2  |
|                     | POA    | <i>Poa</i>                      | 25  | 0.2  | 0.2  | 0.2  |
|                     | POLYP  | <i>Polypodium</i>               | 25  | 0.2  | 0.2  | 0.2  |
|                     | SESP   | <i>Sedum spathulifolium</i>     | 25  | 0.2  | 0.2  | 0.2  |
|                     | TRMI4  | <i>Trifolium microcephalum</i>  | 25  | 0.2  | 0.2  | 0.2  |
|                     | TRWI3  | <i>Trifolium willdenovii</i>    | 25  | 0.2  | 0.2  | 0.2  |
|                     | VISA   | <i>Vicia sativa</i>             | 25  | 0.2  | 0.2  | 0.2  |
|                     | VUMY   | <i>Vulpia myuros</i>            | 25  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |                                 |     |      |      |      |
|                     | 2MOSS  | Moss                            | 75  | 9.7  | 2.0  | 25.0 |
|                     | 2LICHN | Lichen                          | 25  | 12.0 | 12.0 | 12.0 |

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***Spartina foliosa* Alliance**  
**California cordgrass marsh**

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Spartina foliosa* is dominant in the herbaceous layer with algae and *Batis maritima*, *Sarcocornia pacifica*, and *Schoenoplectus californicus*.

The alliance often dominates lower-marsh settings in central and southern California; stands of *Sarcocornia pacifica* or *Salicornia depressa* typically occupy the landward edges of the alliance in mid- to high-marsh settings. For an overview of the state's coastal salt marshes, see Grewell et al. (2007) and MacDonald (1977); for regional descriptions of San Francisco and San Pablo bays, see Josselyn (1983) and Spicher and Josselyn (1985); and for southern California estuaries see J. Zedler (1982) and Zedler et al. (1999).

*Spartina alterniflora*, a highly invasive species, was introduced into San Francisco Bay in the 1970s (Callaway and Josselyn 1992). Early workers assumed that the subsequently invading grass was *Spartina alterniflora* but later work found that the plants invading new sites were hybrids with *S. foliosa* (Ainouche et al. 2004, Ayres et al. 2007). In contrast to the native *Spartina foliosa*, the hybrids grow in upper salt marshes and in deeper water, changing marsh species composition by invading mud flats. These hybrids may eventually eliminate *S. foliosa* (Ayres et al. 2007). See the *Spartina (alterniflora, densiflora)* Semi-Natural Alliance description.

Sonoma County

Small, though distinctive *Spartina foliosa* stands occur at the edges of open water in salty or brackish conditions at Petaluma Marsh and San Pablo Bay. Stands are commonly inundated daily during high tide.

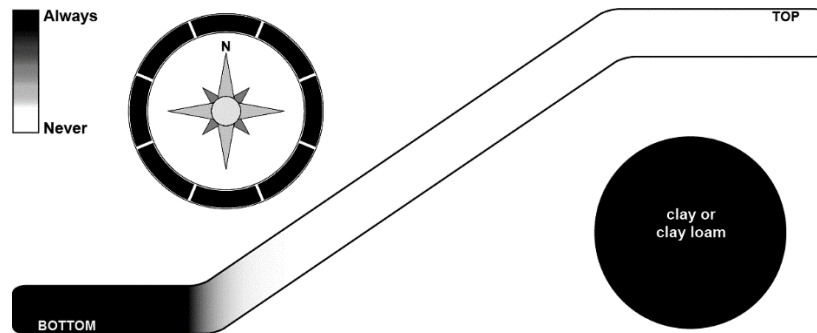
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**Local Alliance Summary (n = 2)**

**Elevation:** 0–6 ft, mean 3 ft

**SCV Global/State Rank:** G3/S3<sup>2</sup>

**Observed Aspect, Topographic Slope Position, and Soil Texture**



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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 19.5         | 13–26         | –          |
| <b>Herb</b>                          | 19.5         | 13–26         | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range |
|--------------------------|-------|-------|
| <b>Slope</b>             | 0.0°  | 0–0°  |
| <b>Large rock cover</b>  | 0.0%  | 0–0%  |
| <b>Small rock cover</b>  | 0.0%  | 0–0%  |
| <b>Bare ground cover</b> | 40.5% | 0–81% |
| <b>Litter cover</b>      | 0.5%  | 0–1%  |

**Associations within this Alliance:**

*Spartina foliosa* Association

**STAND TABLE**

***Spartina foliosa* Alliance**

n = 2

| Lifeform            | Code   | Botanical Name              | Con | Avg  | Min  | Max  |
|---------------------|--------|-----------------------------|-----|------|------|------|
| <b>Herb</b>         |        |                             |     |      |      |      |
|                     | SPFO   | <i>Spartina foliosa</i>     | 100 | 19.5 | 13.0 | 26.0 |
|                     | SAPA30 | <i>Sarcocornia pacifica</i> | 50  | 0.2  | 0.2  | 0.2  |
| <b>Non-vascular</b> |        |                             |     |      |      |      |
|                     | 2ALGA  | Alga                        | 50  | 9.0  | 9.0  | 9.0  |

***Spartina foliosa* Association**

**Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (2) USDA Ecological Subsection (Miles and Goudey 1997).

**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 19.5         | 13–26         | –          |
| <b>Herb</b>                          | 19.5         | 13–26         | 0.5–1      |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

**Aspect:** flat (2)

**Macrotopography:** bottom (2)

**Microtopography:** flat (2)

Classification of the Vegetation Alliances and Associations of Sonoma County, California  
Volume 2 of 2 – Vegetation Descriptions

**Summary of Environmental Data, continued**

**Parent material:** sandy alluvium (1), sedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** flat/0° (2)

|                   | Mean  | Range   |
|-------------------|-------|---------|
| Elevation         | 3 ft. | 0–6 ft. |
| Slope             | 0.0°  | 0–0°    |
| Large rock cover  | 0.0%  | 0–0%    |
| Small rock cover  | 0.0%  | 0–0%    |
| Bare ground cover | 40.5% | 0–81%   |
| Litter cover      | 0.5%  | 0–1%    |

**Samples Used to Describe Association (n=2)**

**Rapid Assessments:** SONO0428

**Relevés:** SONO0421

**SCV Global/State Rank:** G3/S3<sup>1</sup>

**STAND TABLE**

***Spartina foliosa* Association**

n = 2

| Lifeform     | Code   | Botanical Name              | Con | Avg  | Min  | Max  |
|--------------|--------|-----------------------------|-----|------|------|------|
| Herb         |        |                             |     |      |      |      |
|              | SPFO   | <i>Spartina foliosa</i>     | 100 | 19.5 | 13.0 | 26.0 |
|              | SAPA30 | <i>Sarcocornia pacifica</i> | 50  | 0.2  | 0.2  | 0.2  |
| Non-vascular |        |                             |     |      |      |      |
|              | 2ALGA  | Alga                        | 50  | 9.0  | 9.0  | 9.0  |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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

Statewide (Sawyer et al. 2009<sup>1</sup>)

*Typha angustifolia*, *Typha domingensis* or *Typha latifolia* is dominant or co-dominant in the herbaceous layer with *Agrostis stolonifera*, *Argentina egedii*, *Cyperus* spp., *Distichlis spicata*, *Echinochloa crus-galli*, *Eleocharis macrostachya*, *Equisetum telmateia*, *Juncus* spp., *Lemna minuta*, *Lepidium latifolium*, *Oenanthe sarmentosa*, *Persicaria lapathifolia*, *Persicaria punctata*, *Phragmites australis*, *Schoenoplectus americanus*, *Schoenoplectus californicus*, *Typha ×glauca*, and *Xanthium strumarium*. Emergent trees may be present at low cover, including *Salix* spp.

These species require special considerations for correct identification (see Smith 2000), and they commonly hybridize when they grow in mixed stands. Hybrids between *Typha latifolia* and *T. angustifolia* (*T. ×glauca*) are infertile, but plants are vigorous, and rhizome growth creates large clones, especially in eutrophic, disturbed habitats with unstable water levels. Hybrids between *Typha angustifolia* and *T. domingensis* are highly fertile, and colonies are locally common in the state. *T. angustifolia* was probably introduced from Europe. Its range expansion and hybridization with *T. domingensis* make the use of plot database information difficult because of many misidentified herbarium specimens (Smith 2000).

Only a few studies in California include plot data and vegetation analysis. Most studies report mixed stands, so this alliance includes both mixed stands and those with a single dominant. The National Vegetation Classification (NatureServe 2007a) recognizes three *Typha* Alliances for the state. This treatment emphasizes the ecological similarities of the three species, with stand differentiation at the association level. Ecological similarities also exist with stands of larger bulrushes (*Schoenoplectus acutus*, *S. californicus*). Stands where *Typha* and *Schoenoplectus* species share dominance are placed in the *Schoenoplectus* Alliances.

Sonoma County

The two sampled stands are associated with small natural or man-made ponds and lakes in the interior of the county.

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**Local Alliance Summary (n = 2)**

**Elevation:** 5–1273 ft, mean 639 ft

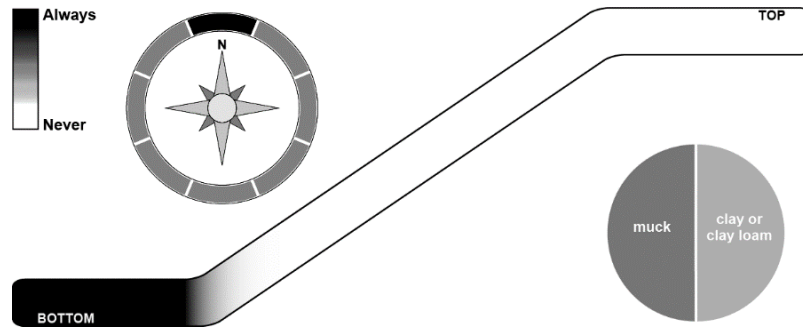
**SCV Global/State Rank:** G5/S5<sup>2</sup>

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<sup>1</sup> All citations for the “Statewide” section can be found in the online *Manual of California Vegetation*.

<sup>2</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

**Observed Aspect, Topographic Slope Position, and Soil Texture**



**Summary of Vegetation Data**

|                                      | Mean % Cover | Range % Cover | Height (m) |
|--------------------------------------|--------------|---------------|------------|
| <b>Total vegetation</b>              | 36.5         | 23–50         | –          |
| <b>Herb</b>                          | 36.5         | 23–50         | 1–5        |
| <b>Shrub</b>                         | 0.0          | 0–0           | –          |
| <b>Regenerating/understory tree*</b> | 0.0          | 0–0           | –          |
| <b>Hardwood</b>                      | 0.0          | 0–0           | –          |
| <b>Conifer</b>                       | 0.0          | 0–0           | –          |

\*Includes seedlings and saplings

**Summary of Environmental Data**

|                          | Mean  | Range  |
|--------------------------|-------|--------|
| <b>Slope</b>             | 1.0°  | 0–2°   |
| <b>Large rock cover</b>  | 0.0%  | 0–0%   |
| <b>Small rock cover</b>  | 0.0%  | 0–0%   |
| <b>Bare ground cover</b> | 57.5% | 22–93% |
| <b>Litter cover</b>      | 39.0% | 4–74%  |

**Associations within this Alliance:**

- Typha domingensis* Association
- Typha latifolia* Association

**STAND TABLE**

***Typha (angustifolia, domingensis, latifolia)* Alliance**

n = 2

| Lifeform    | Code  | Botanical Name                 | Con | Avg  | Min  | Max  |
|-------------|-------|--------------------------------|-----|------|------|------|
| <b>Herb</b> |       |                                |     |      |      |      |
|             | TYPHA | <i>Typha</i>                   | 100 | 22.5 | 20.0 | 25.0 |
|             | TYDO  | <i>Typha domingensis</i>       | 50  | 23.0 | 23.0 | 23.0 |
|             | AZOLL | <i>Azolla</i>                  | 50  | 12.0 | 12.0 | 12.0 |
|             | ALLA2 | <i>Alisma lanceolatum</i>      | 50  | 1.0  | 1.0  | 1.0  |
|             | ELMA5 | <i>Eleocharis macrostachya</i> | 50  | 0.2  | 0.2  | 0.2  |
|             | SCAC3 | <i>Schoenoplectus acutus</i>   | 50  | 0.2  | 0.2  | 0.2  |

## ***Typha domingensis* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Mount St. Helena Flows and Valleys/263Am (1) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 23.0                | 23                   | –                 |
| <b>Herb</b>                          | 23.0                | 23                   | 1–2               |
| <b>Shrub</b>                         | 0.0                 | 0                    | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0                    | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0                    | –                 |
| <b>Conifer</b>                       | 0.0                 | 0                    | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** flat (1)

**Macrotopography:** bottom (1)

**Microtopography:** flat (1)

**Parent material:** sedimentary (1)

**Soil texture:** muck (1)

**Slope steepness:** flat/0° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 5 ft.       | 5 ft.        |
| <b>Slope</b>             | 0.0°        | 0°           |
| <b>Large rock cover</b>  | 0.0%        | 0%           |
| <b>Small rock cover</b>  | 0.0%        | 0%           |
| <b>Bare ground cover</b> | 22.0%       | 22%          |
| <b>Litter cover</b>      | 74.0%       | 74%          |

### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** none

**Relevés:** SONO0380

**SCV Global/State Rank:** G4/S3?<sup>1</sup>

### **STAND TABLE**

#### ***Typha domingensis* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>        | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                              |            |            |            |            |
|                 | TYPHA       | <i>Typha</i>                 | 100        | 25.0       | 25.0       | 25.0       |
|                 | TYDO        | <i>Typha domingensis</i>     | 100        | 23.0       | 23.0       | 23.0       |
|                 | SCAC3       | <i>Schoenoplectus acutus</i> | 100        | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.



## ***Typha latifolia* Association**

### **Distribution in Study Area**

This association was sampled in Sonoma County, within the Coastal Franciscan/263Ag (1) USDA Ecological Subsection (Miles and Goudey 1997).

### **Summary of Vegetation Data**

|                                      | <b>Mean % Cover</b> | <b>Range % Cover</b> | <b>Height (m)</b> |
|--------------------------------------|---------------------|----------------------|-------------------|
| <b>Total vegetation</b>              | 50.0                | 50                   | –                 |
| <b>Herb</b>                          | 50.0                | 50                   | 2–5               |
| <b>Shrub</b>                         | 0.0                 | 0                    | –                 |
| <b>Regenerating/understory tree*</b> | 0.0                 | 0                    | –                 |
| <b>Hardwood</b>                      | 0.0                 | 0                    | –                 |
| <b>Conifer</b>                       | 0.0                 | 0                    | –                 |

\*Includes seedlings and saplings

### **Summary of Environmental Data**

**Aspect:** NE (1)

**Macrotopography:** bottom (1)

**Microtopography:** flat (1)

**Parent material:** metasedimentary (1)

**Soil texture:** clay or clay loam (1)

**Slope steepness:** gentle/1-5° (1)

|                          | <b>Mean</b> | <b>Range</b> |
|--------------------------|-------------|--------------|
| <b>Elevation</b>         | 1273 ft.    | 1273 ft.     |
| <b>Slope</b>             | 2.0°        | 2°           |
| <b>Large rock cover</b>  | 0.0%        | 0%           |
| <b>Small rock cover</b>  | 0.0%        | 0%           |
| <b>Bare ground cover</b> | 93.0%       | 93%          |
| <b>Litter cover</b>      | 4.0%        | 4%           |

### **Samples Used to Describe Association (n=1)**

**Rapid Assessments:** SONO0362

**Relevés:** none

**SCV Global/State Rank:** G5/S4<sup>1</sup>

### **STAND TABLE**

#### ***Typha latifolia* Association**

n = 1

| <b>Lifeform</b> | <b>Code</b> | <b>Botanical Name</b>          | <b>Con</b> | <b>Avg</b> | <b>Min</b> | <b>Max</b> |
|-----------------|-------------|--------------------------------|------------|------------|------------|------------|
| <b>Herb</b>     |             |                                |            |            |            |            |
|                 | TYPHA       | <i>Typha</i>                   | 100        | 20.0       | 20.0       | 20.0       |
|                 | AZOLL       | <i>Azolla</i>                  | 100        | 12.0       | 12.0       | 12.0       |
|                 | ALLA2       | <i>Alisma lanceolatum</i>      | 100        | 1.0        | 1.0        | 1.0        |
|                 | ELMA5       | <i>Eleocharis macrostachya</i> | 100        | 0.2        | 0.2        | 0.2        |

<sup>1</sup> Global and state ranks are estimated from data collected to date; they are subject to change based on increased knowledge of the distribution of the types across the state.

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