

## Galbreath Special Status Species Assessment – Flowering Dicots

*Before I worked on this project, I had no idea how to apply GIS to basic ecological concepts.*  
– Christoph Schopfer, Geography Major

### Project Summary

A team of students and Center staff mapped potential habitat for 110 special status plants and animals on the Galbreath Wildlands Preserve. We identified special status species with potential to occur in the Galbreath Preserve using existing agency databases and publications. These included fungi, bryophytes, plants, invertebrates, amphibians, reptiles, birds and mammals. For each species, we collected biological information, undertook GIS-based habitat suitability analysis, and assessed the likelihood of occurrence within preserve boundaries. The project created professional experience for Biology and Geography undergraduates and graduate students who worked on an interdisciplinary team to develop assessment techniques and methods. See [Methods \(PDF\)](#) and [Species List \(PDF\)](#) for additional information.



**Project Lead:** Claudia Luke

**Dates:** 2010-2011

**Funding:** Robert and Sue Johnson Family

**Students:** Neal Ramus (Business), Emily Harvey (Biology), Kandis Gilmore (Biology), Linden Schneider (Biology), Christoph Schopfer (Geography), James Sherwood (Geography)

### Flowering Dicots

These results are part of a larger assessment of all special status species with potential to occur at the Galbreath Wildlands Preserve. Assessments were conducted as planning exercise and do not constitute evidence of occurrence.

## **Asteraceae**

*Hemizonia congesta* ssp. *congesta*, Pale Yellow Hayfield Tarplant: [HECO Text](#), [HECO Map](#)

*Lasthenia burkei*, Burke's Goldfields: [LABU Text](#), [LABU Map](#)

*Layia septentrionalis*, Colusa Layia: [LASE Text](#), [LASE Map](#)

*Packera bolanderi* var. *bolanderi*, Seacoast Ragwort: [PABO Text](#), [PABO Map](#)

*Tracyina rostrata*, Beaked Tracyina: [TRRO Text](#), [TRRO Map](#)

## **Boraginaceae**

*Cryptantha clevelandii* var. *dissita*, Serpentine Cryptantha: [CRCL Text](#), [CRCL Map](#)

## **Brassicaceae**

*Streptanthus morrisonii* ssp. *morrisonii*, Morrison's Jewel-Flower: [STMO Text](#), [STMO Map](#)

*Streptanthus glandulosus* var. *hoffmanii*, Hoffman's Bristly Jewel-Flower: [STGL Text](#), [STGL Map](#)

## **Campanulaceae**

*Campanula californica*, Swamp Harebell: [CACA Text](#), [CACA Map](#)

## **Caprifoliaceae**

*Viburnum ellipticum*, Oval-Leaved Viburnum: [VIEL Text](#), [VIEL Map](#)

## **Convolvulaceae**

*Calystegia collina* ssp. *tridactylosa*, Three Fingered Morning Glory: [CACO Text](#), [CACO Map](#)

## **Ericaceae**

*Arctostaphylos bakeri* ssp. *sublaevis*, The Cedars Manzanita: [ARBA Text](#), [ARBA Map](#)

*Arctostaphylos canescens* ssp. *sonomensis*, Sonoma Canescent Manzanita: [ARCA Text](#), [ARCA Map](#)

*Arctostaphylos stanfordiana* ssp. *decumbens*, Rincon Ridge Manzanita: [ARSTD Text](#), [ARSTD Map](#)

*Arctostaphylos stanfordiana* ssp. *raichei*, Raiche's Manzanita: [ARSTR Text](#), [ARSTR Map](#)

### **Fabaceae**

*Astragalus agnicidus*, Humbolt County Milk-Vetch: [ASAG Text](#), [ASAG Map](#)

*Lupinus sericatus*, Cobb Mountain Lupine: [LUSE Text](#), [LUSE Map](#)

*Thermopsis robusta*, Robust False Lupine: [THRO Text](#), [THRO Map](#)

\**Trifolium buckwestiorum*, Santa Cruz Clover: [TRBU Text](#), [TRBU Map](#)

### **Juglandaceae**

*Juglans hindsii*, Northern California Black Walnut: [JUHI Text](#), [JUHI Map](#)

### **Lamiaceae**

*Monardella villosa* ssp. *globosa*, Robust Monardella: [MOVI Text](#), [MOVI Map](#)

### **Limnanthaceae**

*Limnanthes bakeri*, Baker's Meadowfoam: [LIBA Text](#), [LIBA Map](#)

### **Linaceae**

*Hesperolinon adenophyllum*, Glandular Western Flax: [HEAD Text](#), [HEAD Map](#)

### **Malvaceae**

*Malacothamnus hallii*, Hall's Bush-Mallow: [MAHA Text](#), [MAHA Map](#)

*Malacothamnus mendocinensis*, Mendocino Bush-Mallow: [MAME Text](#), [MAME Map](#)

### **Onagraceae**

*Epilobium oreganum*, Oregon Fireweed: [EPOR Text](#), [EPOR Map](#)

### **Orobanchaceae**

*Boschniakia hookeri*, Small Groundcone: [BOHO Text](#), [BOHO Map](#)

## **Polemoniaceae**

*Leptosiphon jepsonii*, Jepson's Leptosiphon: [LEJE Text](#), [LEJE Map](#)

*Navarretia leucocephala ssp. bakeri*, Baker's Navarretia: [NALE Text](#), [NALE Map](#)

*Polemonium carneum*, Oregon Polemonium: [POCA Text](#), [POCA Map](#)

## **Polygonaceae**

*Eriogonum cedrorum*, The Cedars Buckwheat: [ERCE Text](#), [ERCE Map](#)

## **Ranunculaceae**

*Coptis laciniata*, Oregon Goldthread: [COLA Text](#), [COLA Map](#)

## **Rhamnaceae**

*Ceanothus confuses*, Rincon Ridge Ceanothus: [CECO Text](#), [CECO Map](#)

## **Rosaceae**

*Horkelia tenuiloba*, Thin-Lobed Horkelia: [HOTE Text](#), [HOTE Map](#)

*Rosa pinetorum*, Pine Rose: [ROPI Text](#), [ROPI Map](#)

*Sanguisorba officinalis*, Great Burnet: [SAOF Text](#), [SAOF Map](#)

*Magnoliopsida (Flowering Plants): Asteraceae*  
**Hayfield Tarplant (*Hemizonia congesta* ssp. *congesta*)**  
**Potential Occurrence: Likely to Occur**

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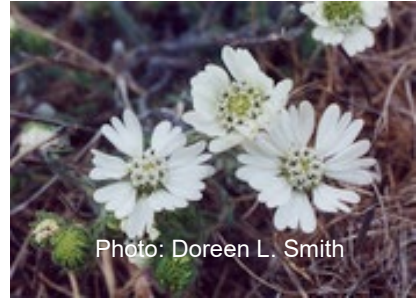
**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** The Hayfield Tarplant has long, soft hairs and is glandular growing 10 to 80 cm tall with linear to narrowly elliptic leaves that have entire to sparsely dentate margins (Hickman 1996). The lower leaves are dark green to silvery canescent (Hickman 1996). The inflorescence is composed of open, sometimes peduncled, radiate heads in tight groups or panicle like clusters with long, soft hairs and dense, stalked glands on the 6 to 10 mm long phyllaries (Hickman 1996; Rosatti 2008). The chaff scales are scattered, fused at the base, and fall with the disk flowers (Hickman 1996). The 5 to 13 ray flowers are white with a purple axial vein (Rosatti 2008).

**Nomenclature:** *Hemizonia congesta* DC. ssp. *congesta* Asteraceae (USDA 2010)

**Synonyms:** *Hemizonia congesta* subsp. *leucocephala* (Tanowitz) D.J. Keil, *Hemizonia congesta* DC. ssp. *vernalis* (D. D. Keck) Tanowitz, *Hemizonia leucocephala* Tanowitz, *Hemizonia luzulifolia* DC. var. *lutescens* Greene (Regents of the University of California 2010; USDA 2010).

**Distribution:** This species occurs in the southern outer North Coast Ranges, the southwestern inner North Coast Ranges, on the north Central Coast, and in the west San Francisco Bay Area (Rosatti 2008).

Specimens identified as this taxon from El Dorado, Mendocino, Solano, and Yolo counties are believed to be mis-identifications (B. Baldwin, pers. comm. to N. Jensen and R. Bittman 2008).  
(From NatureServe 2009)

**Life History & Threats:** The Hayfield Tarplant is an annual herb blooming from April to November that is threatened by development, land conversion to agriculture and possibly by grazing (CNPS 2010; NatureServe 2009).

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Habitat for this species is marsh edges in grasslands (NatureServe 2009).

**Vegetation Types:** Habitat for this species is valley and foothill grassland dominated by introduced Mediterranean grasses and native herbs (CNPS 2010).

**Topography and Microclimates:** sometimes roadsides (CNPS 2010)

Given moderate summer watering, and full or nearly full sun (tolerates summer afternoon sun), grows especially well in zones 15, 16, and 17 and also in zone 24. (From Jepson Horticultural Database 2006).

*Elevation:* 20 to 560 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- below 590 m in elevation. (A 30 m buffer was included around known elevational occurrences of this species).
- grasslands

We additionally mapped possible best potential habitat in the areas identified above as

- road edges

Note that marshes do not occur in the Study Area.

#### **Potential Occurrence on the Galbreath Wildlands Preserve:**

*Habitat:* Hayfield Tarplant occurs in wet and sometimes disturbed areas (i.e., roadsides) in grasslands. Grasslands on the Preserve are not abundant. The most extensive patch is located on the Preserve's northern boundary. Habitat quality for Hayfield is good. Grasslands on the Preserve are dominated by Mediterranean grasses and native herbs, which are often found in association with Hayfield Tarplant. Four grassland areas are also bisected by roads and roadsides are a known habitat for the species.

#### *Nearest Occurrence:*

Documented Occurrences on Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: Hayfield Tarplant has been documented north and south of the Preserve in Mendocino and Sonoma counties. The species is known from 15 occurrences in Mendocino County, with the nearest occurrence (*H. congesta* ssp. *congesta*) approximately 12 miles northeast of the Preserve in the Upper Russian River watershed (Calflora 2010). Nature Serve (2010), however, notes that specimens identified as *H. congesta* ssp. *congesta* from Mendocino County are misidentified.

*Summary:* We anticipate the Hayfield Tarplant to be "Likely to Occur" because habitat is in enough quantity to support a population and is of good quality. However, further taxonomic analysis may find that this species does not occur in Mendocino County and the potential for this species to occur on the Preserve would need to be reevaluated.

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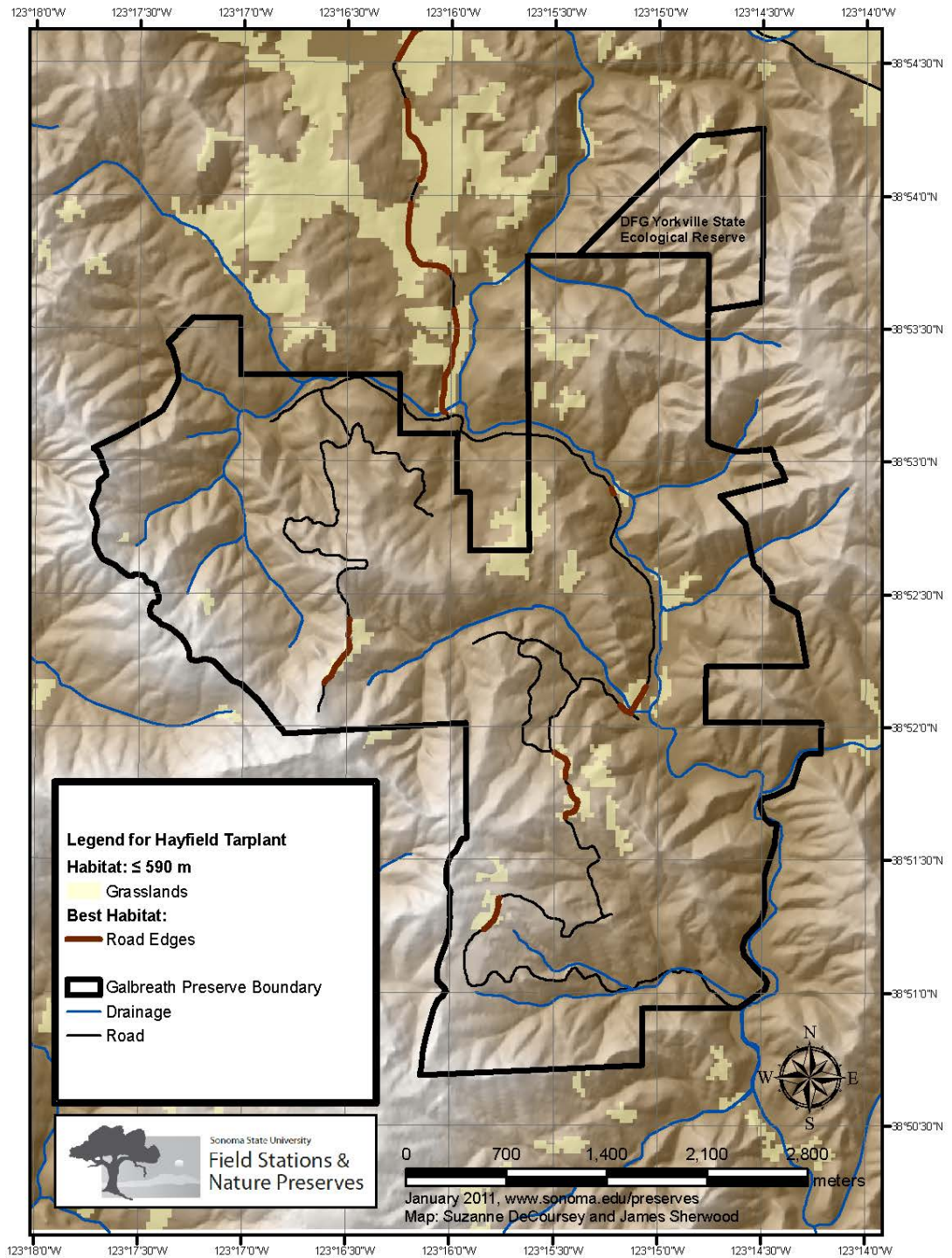
Smith V. 2010. *Hemizonia congesta* ssp. *congesta*. Hayfield Tarplant. <[http://calphotos.berkeley.edu/cgi-bin/img\\_query?rel-taxon=contains&where-taxon=Hemizonia+congesta+ssp.+congesta|Hemizonia+congesta+ssp.+leucocephala|Hemizonia+congesta+ssp.+lutescens](http://calphotos.berkeley.edu/cgi-bin/img_query?rel-taxon=contains&where-taxon=Hemizonia+congesta+ssp.+congesta|Hemizonia+congesta+ssp.+leucocephala|Hemizonia+congesta+ssp.+lutescens)>. Accessed 2011 Feb 27.

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**Species Account Description:** Linden Schneider

Figure 17. Potential habitat for Hayfield Tarplant, *Hemizonia congesta ssp. congesta*





Magnoliopsida (Flowering Plants): Asteraceae  
**Burke's Goldfields (*Lasthenia burkei*)**  
**Potential Occurrence: Unlikely to Occur**

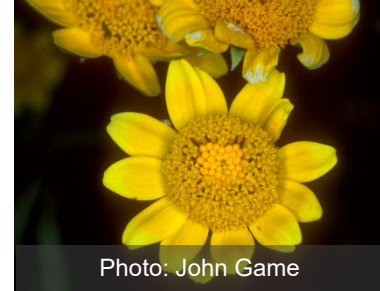
**Status:**

Federal: Endangered

State: Endangered

CNPS: 1B.1

Other: none



**Species Description:** Burke's Goldfields is hairy and less than 30 cm tall with opposite linear, entire or pinnately lobed leaves, which can be glabrous to more or less hairy (Hickman 1996). The inflorescence is radiate with a dome shaped or obconic involucre made of 7 to 16 free and hairy phyllaries (Hickman 1996). The ray flowers number 8 to 13 and are generally yellow (Hickman 1996). The disk flowers are many and generally yellow with triangular style tips (Hickman 1996). The fruit is a club shaped, hairy achene with a papus of one long awn and many short scales (Hickman 1996).

**Nomenclature:** *Lasthenia burkei* (Greene) Greene Asteraceae (USDA 2010)

**Synonyms:** *Baeria burkei* Greene (Regents of the University of California 2010)

**Distribution:** This species occurs in the southern inner North Coast Ranges in south Mendocino, Lake, and northeast Sonoma counties between 15 and 600 m, and its type locality is in Ukiah (Hickman 1996; Smith and Wheeler 1992). This species has also been documented in the outer North Coast Ranges (CalFlora 2010). It is thought that the one population in Mendocino County is extirpated (Sacramento Fish and Wildlife Office 2005).

**Life History & Threats:** Burke's Goldfields is an annual that germinates during flooding and blooms as the vernal pool dries from April to June (CNPS 2010; CPC 2010).

Primary threats to the species consist of activities that result in the destruction of the plants or hydrologic changes in their vernal pool habitats. Such activities include urbanization, industrial development, agricultural land conversion, off-highway vehicle use, horseback riding, trampling by grazing cattle, and road widening. Damage or destruction of vernal pool habitat happens quickly and easily due to the extremely friable nature of the soil and the dependency of the pool upon an intact *durapan* (impermeable subsurface soil layer). (From Sacramento Fish and Wildlife Office 2005)

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Vernal Pools (CNPS 2010)

**Vegetation Types:** Mesic meadows and seeps which are dominated by more or less dense grasses, sedges, and herbs (CNPS 2010).

**Elevation:** 15 to 600 m

*Geology and Soils:* durapan (Sacramento Fish and Wildlife Office 2005)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 630 m elevation (includes a 30 m buffer around known elevational occurrences)
- grasslands
- seasonal ponds. Note that seasonal ponds in the Study Area do not occur in, or near, grasslands; as such they were not included in the map.

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Burke's Goldfields occurs in vernal pools and seeps in grasslands. Potential habitat is limited. Grasslands on the Preserve are not abundant. The most extensive patch is located on the northern most boundary of the Preserve. Mapped grasslands (Figure 18) overestimate habitat since this species would only be found in wet areas in grasslands. Springs and seeps, however, are common throughout the Preserve.

Habitat quality is poor. Vernal pools do not occur in Preserve boundaries (The one seasonal pond is above the elevational range for the species, does not occur in grassland, and does not show the gradual seasonal drying typical of vernal pool communities.) Grassland seeps in the Preserve, however, do show the types of dense grasses, sedges, and herbs that are typical associates of Burke's Goldfields. These seeps are typically dominated by rushes (*Juncus* spp.), sedge (*Cyperus eragrostis*), mint (*Menthe pulegium*), and bracken ferns (*Pteridium aquilium*). Disturbance of these wet sites by the abundant wild pig may reduce the likelihood of this species occurrence.

*Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Burke's Goldfields is documented from areas north, south and east of the Preserve in Mendocino, Sonoma and Lake counties. This species is known from 5 occurrences in Mendocino County (Calflora 2010), and one population in Ukiah is believed to be extirpated. The nearest historic documented occurrence to the Preserve is approximately 22 miles northeast of the Preserve in the Upper Russian River watershed (Calflora 2010). Most occurrences for this species are east of the Preserve in warmer inland areas; finding Burke's Gold Fields on the Preserve would be the first time the species has been found in the outer coast ranges.

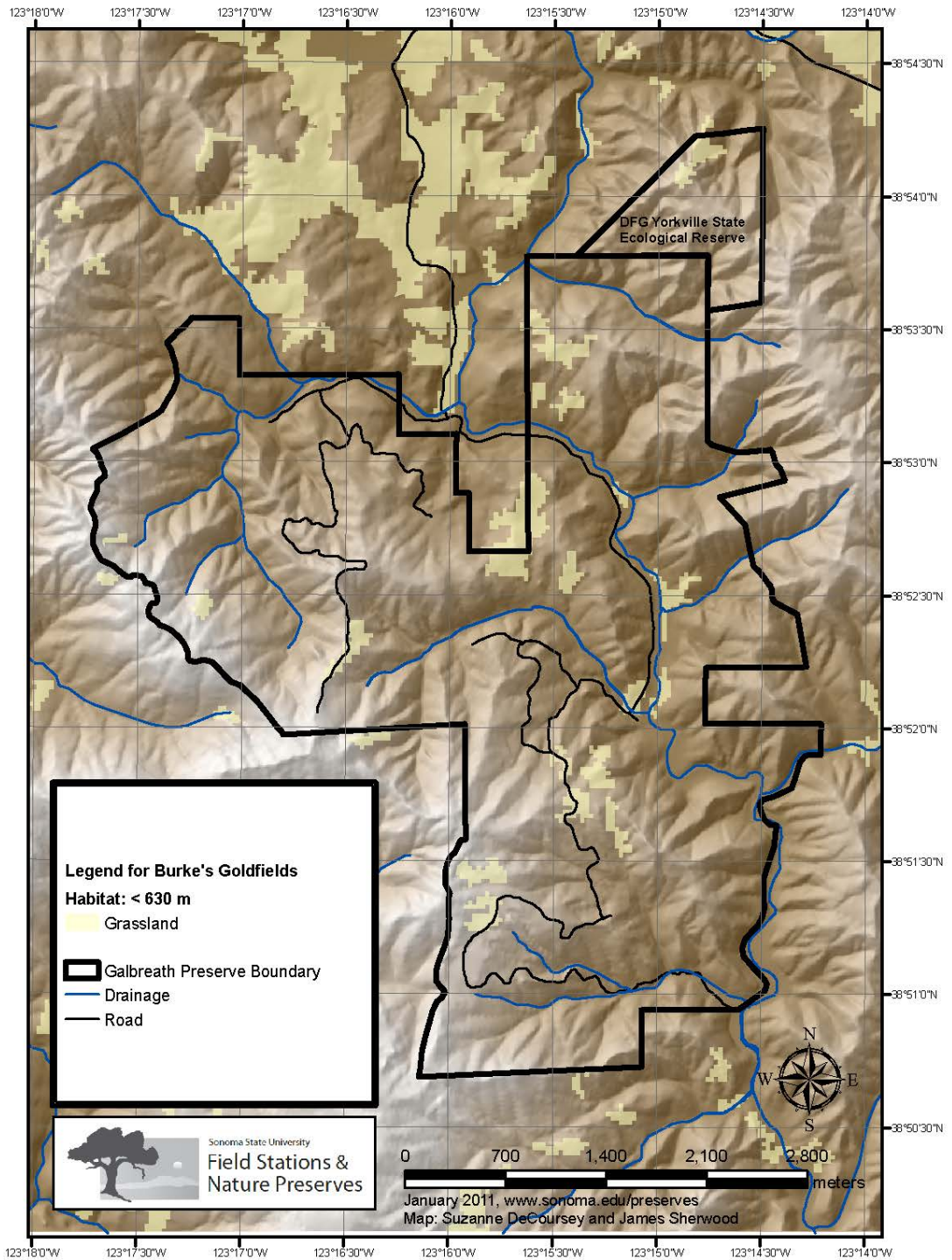
*Summary:* Burke's Goldfields is "Unlikely to Occur" in the Preserve because habitat is limited, and poor quality, and the cooler climate of the outer coast range may be inappropriate for this species.

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**Species Account Description:** Linden Schneider

Figure 18. Potential habitat for Burke's Goldfields, *Lasthenia burkei*



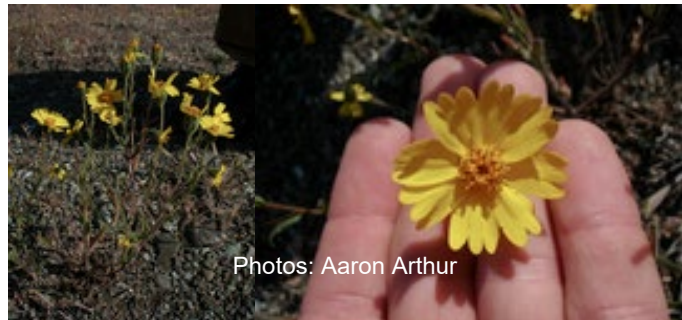
**Status:**

Federal: None

State: S2.2

CNPS: List 1B.2

Other: Global G2



**Species Description:** The Colusa Layia grows from 6 to 35 cm tall and the leaves are linear to lance-shaped and up to 7 cm in length (CNPS 2010) The inflorescence has peduncles less than 8 cm, and involucre which is more or less narrow elliptic to bell-shaped, and phyllaries 5-12 mm in length (Hickman 1996). The basal margins of the inflorescence are interlocked by cottony hairs, and chaff scales separate the ray and disk flowers (Hickman 1996). Ray flowers are yellow, number between 5 and 9, and have a toothed margin (Hickman 1996). Disc flowers have 5-8 mm long corollas and number between 10 and 67 with yellow anthers (Hickman 1996). Fruits are 3.5-7.5 mm, have a disk pappus of 16-22 bristles, white with a densely woolly inner surface (Hickman 1996). The fruits are scabrous above and densely plumose below (Hickman 1996).

**Nomenclature:** *Layia septentrionalis* D.D. Keck Asteraceae (USDA 2010)

**Synonyms:** none

**Distribution:** North Coast ranges and Sutter Buttes in the central valley (CNPS 2010).

**Life History & Threats:** Blooms April to May. Threatened by development (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** CNPS habitat types where this species is found include: Chaparral, Cismontane woodland, Valley and foothill grassland (CNPS 2010).

**Topography and Microclimates:** Rocky soils in fields or grassy slopes (CalFlora, 2010)

**Elevation:** 100-1024 m (CNPS 2010). (The Study Area ranges from 230 to 710 m).

**Geology and Soils:** Occurs on serpentine or sandy soils (Hickman 1996). Rocky soils (CalFlora 2010). It is described as a strong indicator of serpentine soils with 75 to 84% of occurrences on ultramafics (Calfora 2010).

**Species Associations:** Some of the species known to occur in association with Colusa layia in the Central Valley include one-sided bluegrass (*Poa secunda*), spinster's blue-eyed Mary (*Collinsia sparsiflora*), imbricate scorpionweed (*Phacelia imbricata*), Fremont's death camas (*Zigadenus fremontii*), varileaf phacelia (*Phacelia heterophylla*), and California poppy (*Eschscholzia californica*) (CDFG 2007).

**Conceptual Basis for GIS Model Development:** We mapped potential habitat for this species as all areas:

- chaparral
- grassland
- cismontane woodland (i.e., mixed, montane mixed, or single dominant hardwood vegetation with a canopy cover of < 40%)

Best habitat was mapped as areas occurring in the above vegetation types with:

- sandy or rocky soils (i.e., sandy loam, gravelly loam, very gravelly loam, cobbly loam, very cobbly loam, or alluvium soil textures)

Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Colusa Layia is a strong indicator of serpentine, but also can be found on sandy or rocky soils in chaparral, grassland or hardwood woodlands. Habitat quality for this species in the Preserve is poor. Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Galbreath Wildlands Preserve. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.

The best potential habitat for Colusa Layia in the Preserve is sandy and rocky areas grassland and cismontane woodland. (No chaparral occurs within the Preserve). These areas are patchily distributed. The largest contiguous patch of is located in central to northeastern portion of the Preserve and is composed of rocky or sandy soils in hardwood woodland.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve Previous species list for the Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Colusa Layia is widely distributed in the North Coast Ranges. This species is known from 6 locations in Mendocino County and the nearest within approximately 20 miles northeast of the Preserve on Mountain House Road (Calflora 2010). Occurrence of this species on the Preserve would be a western range extension for this species.

*Summary:* We anticipate the Colusa Layia to be “Unlikely to Occur” because the Preserve lacks serpentine soils, the remaining suboptimal habitat is limited, and the species is more commonly documented from areas further inland.

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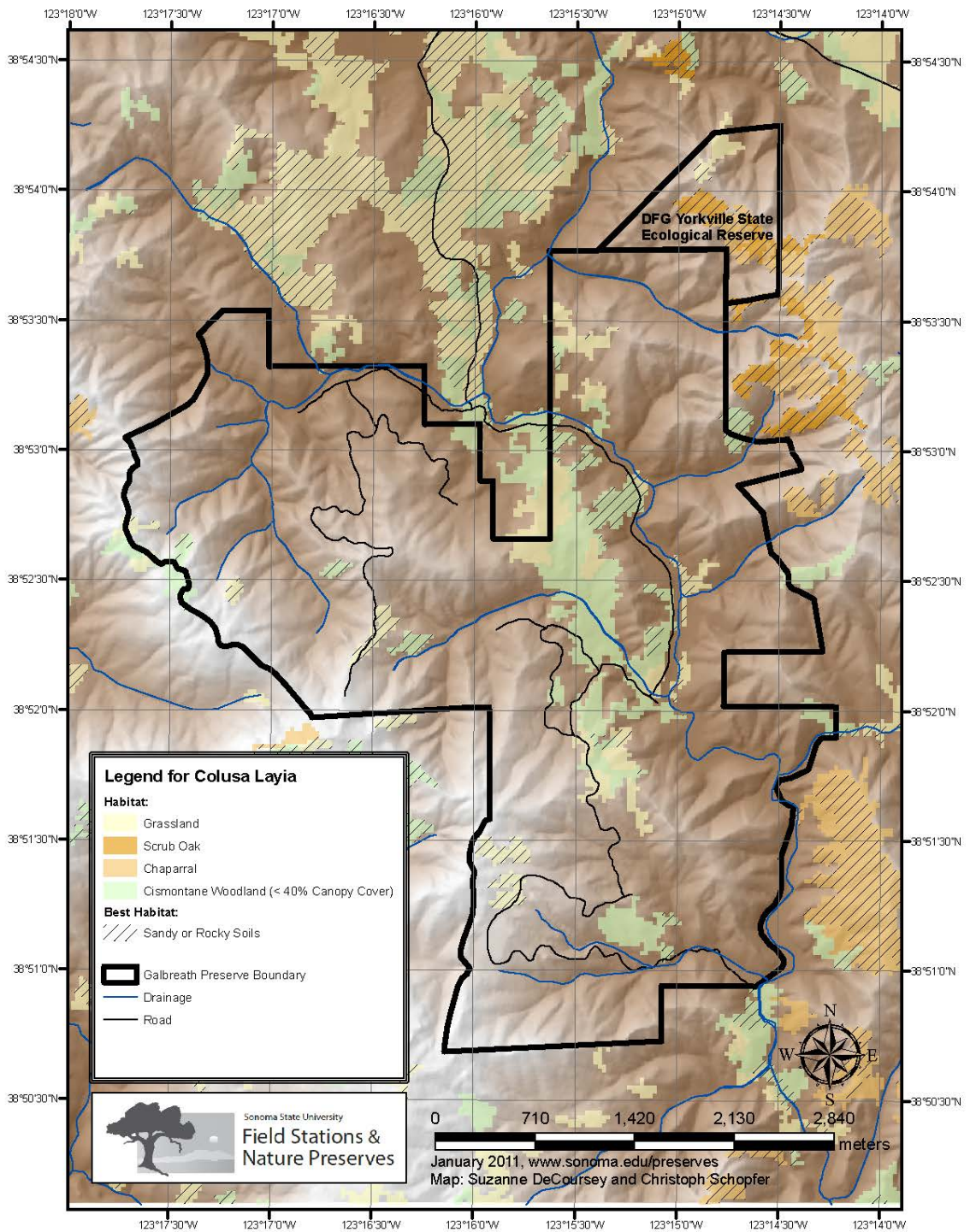
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**Species Account Description:** Kandis Gilmore & Linden Schneider

Figure 19: Potential habitat for Colusa Layia (*Layia septentrionalis*)





*Magnoliopsida (Flowering Plants): Asteraceae*  
**Seacoast Ragwort (*Packera bolanderi* var. *bolanderi*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 2.2

Other: None



**Species Description:** The Seacoast Ragwort has 1 to 3 clustered, glabrous stems, 20 to 70 cm tall with round to oblong, pinnately lobed, glabrous basal leaves and lanceolate cauline leaves with incised margins (Rosattii 1996). The inflorescence is radiate with 13 or 21 phyllaries that are brown and multi-celled hairy (Rosattii 2008). There are 8 or 13 ray flowers and 30 to 45 disk flowers both of which are yellow. The fruit is glabrous with a pappus of white minutely barbed bristles (Rosattii 2008).

**Nomenclature:** *Packera bolanderi* (A. Gray) W.A. Weber & A. Löve var. *bolanderi* Asteraceae (USDA 2010)

**Synonyms:** *Senecio bolanderi* A. Gray var. *bolanderi* (Regents of the University of California 2010)

**Distribution:** This species occurs from Washington to the North Coast of California between 30 and 650 m elevation (CNPS 2010; Rosattii 2008)

**Life History & Threats:** The Seacoast Ragwort is a perennial herb growing from a fibrous, rooting, creeping caudex and blooms from February to July (CNPS 2010; Rosattii 2008). This species is potentially threatened by erosion and logging (CNPS 2010; Sholars and Golec 2007)

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is coastal scrub dominated by dense shrubs and scattered grass openings and coast coniferous forests dominated by needle leaved evergreen trees (CNPS 2010).

**Topography and Microclimates:** Wet cliffs, open forest (Hickman 1996). Sand barrens (Smith and Wheeler 1992). Forest understory to openings along streams, shade tolerant, mesic (Sholars and Golec 2007). Sometimes roadsides (CNPS 2010).

**Elevation:** 30 to 650 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** Not tolerant of soil disturbance or compaction (Sholars and Golec 2007). Loamy, gravelly soil on roadside in wet redwood forest (Freeman and Wetter 1983).

*Species Associations:* Numerous herbaria specimen label data for Mendocino County indicate specimens were found in association with wet areas in Coast Redwood Forest (*Sequoia sempervirens*) (Freeman and Wetter 1983).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- coniferous forest (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*) vegetation types).

We additionally mapped possible best potential habitat in the areas identified above as:

- watercourses
- roadsides

Note that:

- road margins are the only GIS data layer with relevance to “openings” in the Study Area, and other types of forest openings could not be mapped.
- The upper elevational range for this species (including the 30 m buffer around known elevational occurrences) is 680 m in elevation. Because the elevational limit is very close to upper elevation of the Preserve (710 m), we did not clip the vegetation layers to this limit.
- Seeps and springs occur in the Preserve but have not been mapped.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Seacoast Ragwort occurs in moist areas and streams of coastal scrub and coniferous forests. Coastal scrub does not occur in the Preserve and potential habitat is limited to in coniferous forest. Potential habitat identified in Figure 20 is overestimated in that Seacoast Ragwort does not occur in coniferous forest where streamsides, seeps, springs, and possibly roadsides do not exist. Seeps and springs, however, are relatively common on Preserve lands.

Habitat quality for this disturbance-intolerant species is likely poor due to historic and current high levels of disturbance. The Preserve has a history of logging. Timber harvest plans indicate that both clear cut and selection cut methods were used to harvest Redwood, Douglas Fir, and hardwoods at least between 1988 and 2000. This large scale disturbance may have compromised the quality of habitat for this species which is known to be threatened by logging. In addition, pigs are abundant on the Preserve and regularly disturb seeps, springs and streams especially during the summer months.

*Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Seacoast Ragwort is limited to coastal counties and is not known to occur south of Mendocino County in California. This species is known from 18 occurrences in Mendocino County (Calflora 2010) all of which occur north and west of the Preserve. The nearest occurrence is approximately 37 miles northwest of the Galbreath Wildlands Preserve in the Big River watershed (Calflora 2010). Occurrence of this northern coastal species on the Preserve would constitute a southeastern range extension for the species of 37 miles (Calflora 2010).

*Summary:* The Seacoast Ragwort is “Unlikely to Occur” on the Galbreath Wildlands Preserve. Habitat quality is likely poor due to historic (logging) and current (pigs) levels of disturbance, and an occurrence of the species at the Preserve would constitute both a southern and eastern range extension for the species.

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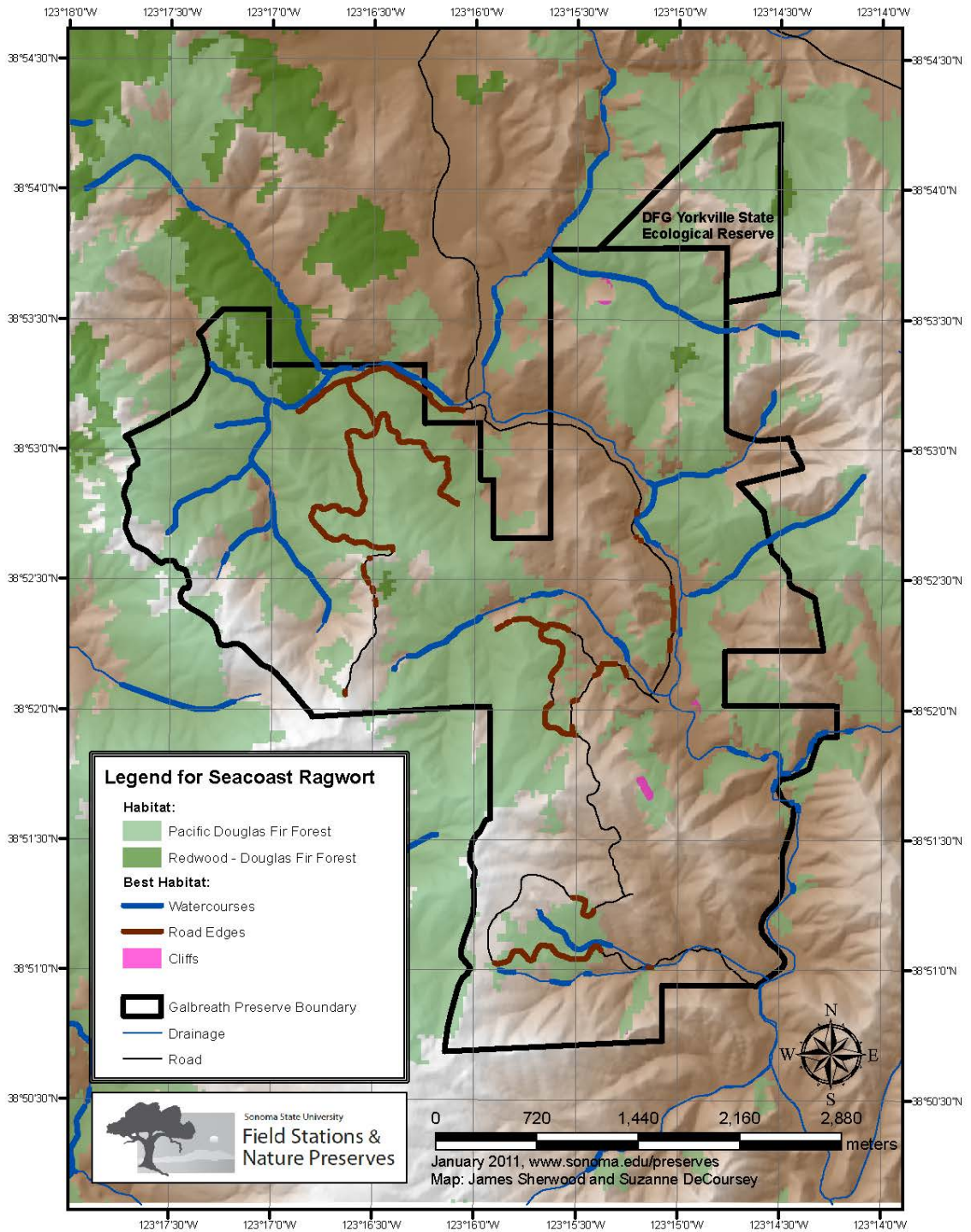
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**Species Account Description:** Linden Schneider

Figure 20: Potential habitat for Seacoast Ragwort (*Packera bolanderi bolanderi*)



*Magnoliopsida (Flowering Plants): Asteraceae*  
**Beaked Tracyina (*Tracyina rostrata*)**  
**Potential Occurrence: Likely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** The Beaked Tracyina stands less than 35 cm tall with an erect branched stem and alternate, entire, narrowly lanceolate leaves with hairy margins (Hickman 1996). The heads are radiate and terminal with a cylindrical to widely obovoid involucre and phyllaries in 2 to 4 series, which fall separately (Hickman 1996). There are less than 22 ray flowers, which are in one series and pale or greenish yellow and red tinged (Hickman 1996). There are less than 26 disk flowers, which are also pale to greenish yellow. The fruit is cylindrical or fusiform and brown with a short hairy beak and a pappus of less than 40 slender bristles (Hickman 1996).

**Nomenclature:** *Tracyina rostrata* S.F. Blake Asteraceae (USDA 2010)

**Synonyms:** none

**Distribution:** This species occurs in the North Coast Ranges of Northern California (Rosattii 2008).

**Life History & Threats:** The Beaked Tracyina is an annual or biannual herb, blooms from May to June, and is generally self pollinated (CNPS 2008; Hickman 1996; Rosattii 2008). Threats to this species include grazing by sheep, non-native invasive annual grasses, Klamath weed and possible energy development (NatureServe 2009).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is valley and foothill grasslands dominated by introduced Mediterranean grasses and native herbs, and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:** open, grassy habitats within oak woodland, dry grassy slopes (NatureServe 2009).

**Elevation:** 90 to 790 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- grasslands

- cismontane woodland (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)

We additionally mapped possible best potential habitat in the areas identified above as:

- dry slopes (>8° slopes facing S, SE, or SW)

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Habitat for this species, grassland and cismontane woodlands, occur commonly in the central portion of the Galbreath Wildlands Preserve. Approximately half of this potential habitat occurs on the dry slopes preferred by Beaked Tracyina. The map may overestimate suitable habitat because grasslands and some areas of the cismontane understory are dominated by non-native annual grasses, which are a threat to this species. Despite the occurrence of non-natives, an understory of native grasslands are common on the Preserve, and we estimate habitat quality as moderate to good quality.

*Nearest Occurrence:*

Documented Occurrences in Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: This species is known from areas north (Humboldt County), south (one occurrence in Sonoma County) and east (6 occurrences in Mendocino County) of the Preserve (Calflora 2010). Distances among reported occurrences are commonly 10 miles or more. The nearest occurrence to the Preserve is approximately 6 miles to the southeast in Big Foot Mountain Quad at the top of the Middle Russian River watershed (Calflora 2010).

*Summary:* We anticipate this species to be “Likely to Occur” because the species occurs nearby (relative to distances among other documented occurrences), and habitat is moderate to good quality and relatively abundant in the Preserve.

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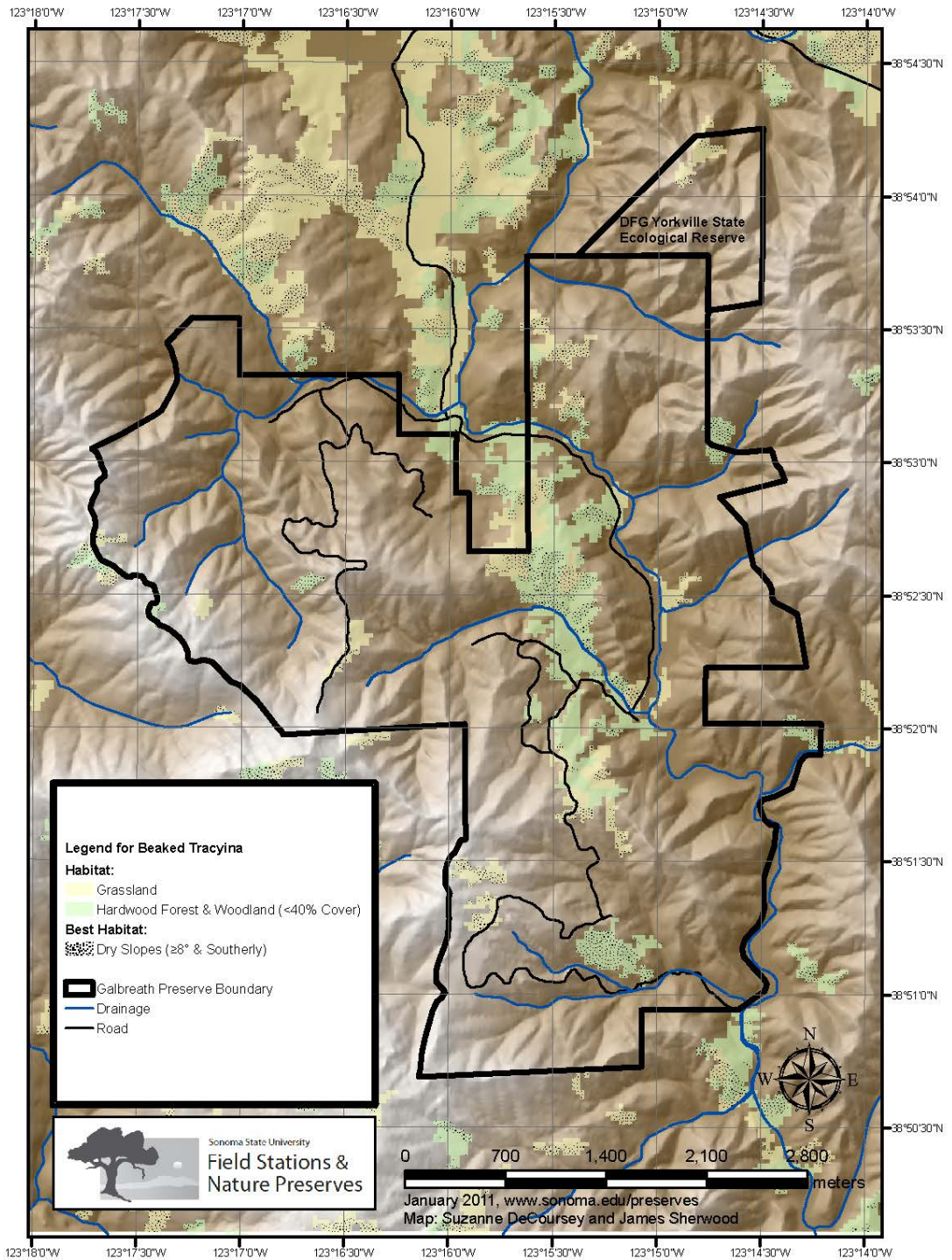
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<<http://plants.usda.gov/java/profile?symbol=TRRO>>. Accessed 2010 Jul 20.

**Species Account Description:** Linden Schneider



Figure 21. Potential habitat for Beaked Tracyina, *Tracyina rostrata*



*Magnoliopsida (Flowering Plants): Boraginaceae*  
**Serpentine *Cryptantha* (*Cryptantha clevelandii* var. *dissita*)**  
**Potential Occurrence: Not Expected to Occur**

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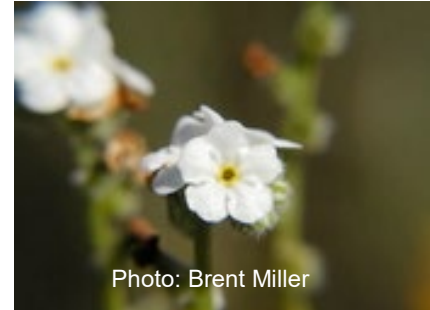
**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: None



**Species Description:** The Serpentine *Cryptantha* is an erect, tufted and stout herb growing to 8 to 25 cm high with oblong to wide, linear, long soft hairy leaves crowded at the base (Rosatti 2008). The inflorescence has 2 to 3 flowers with very small pedicels of 0.5 mm (Rosatti 2008). The flower has a dense, soft hairy calyx with a few dark tipped bristles and a deciduous, white corolla with pale yellow appendages (Rosatti 2008). The fruit is composed of 2 to 4 lanceolate to lance-ovate, generally mottled, smooth, shiny, beak-tipped nutlets (Rosatti 2008).

**Nomenclature:** *Cryptantha clevelandii* var. *dissita* (USDA 2010)

**Synonyms:** *C. dissita* (Rosatti 2008)

**Distribution:** This species is found in the eastern Klamath Ranges, the southeast North Coast Ranges, the southern Inner North Coast Ranges (Rosatti 2008).

**Life History & Threats:** The Serpentine *Cryptantha* is an annual herb blooming from April to June. This species was previously thought to be extinct, but was rediscovered in 2005 (NatureServe 2009).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches (CNPS 2010).

**Topography and Microclimates:** This species is a broad endemic and strong indicator of serpentine soil; 85 to 90% of occurrences are on ultramafics (Calflora 2010).

**Elevation:** 395 to 580 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** serpentinite (CNPS 2010)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- between 365 and 610 m elevation (includes a 30 m buffer relative to known elevational occurrences)

- chaparral (including scrub oak)

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Serpentine *Cryptantha* habitat is serpentine soils in chaparral which is not found in the Galbreath Wildlands Preserve. Chaparral only occurs outside of the boundaries of the Galbreath Wildlands Preserve. Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Galbreath Wildlands Preserve. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.

*Nearest Occurrence:*

Documented Occurrences on the Galbreath Wildlands Preserve: A previous site visit of the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010)

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is known from 4 occurrences in Mendocino County and counties to the east (Lake) and south (Sonoma) (Calflora 2010). All documented occurrences lie east of the Preserve. The nearest occurrence is approximately 11 miles east of the Galbreath Wildlands Preserve at the top of the Middle Russian River watershed (Calflora 2010).

*Summary:* We anticipate this species as “Not Expected to Occur” because potential habitat does not occur in the Preserve.

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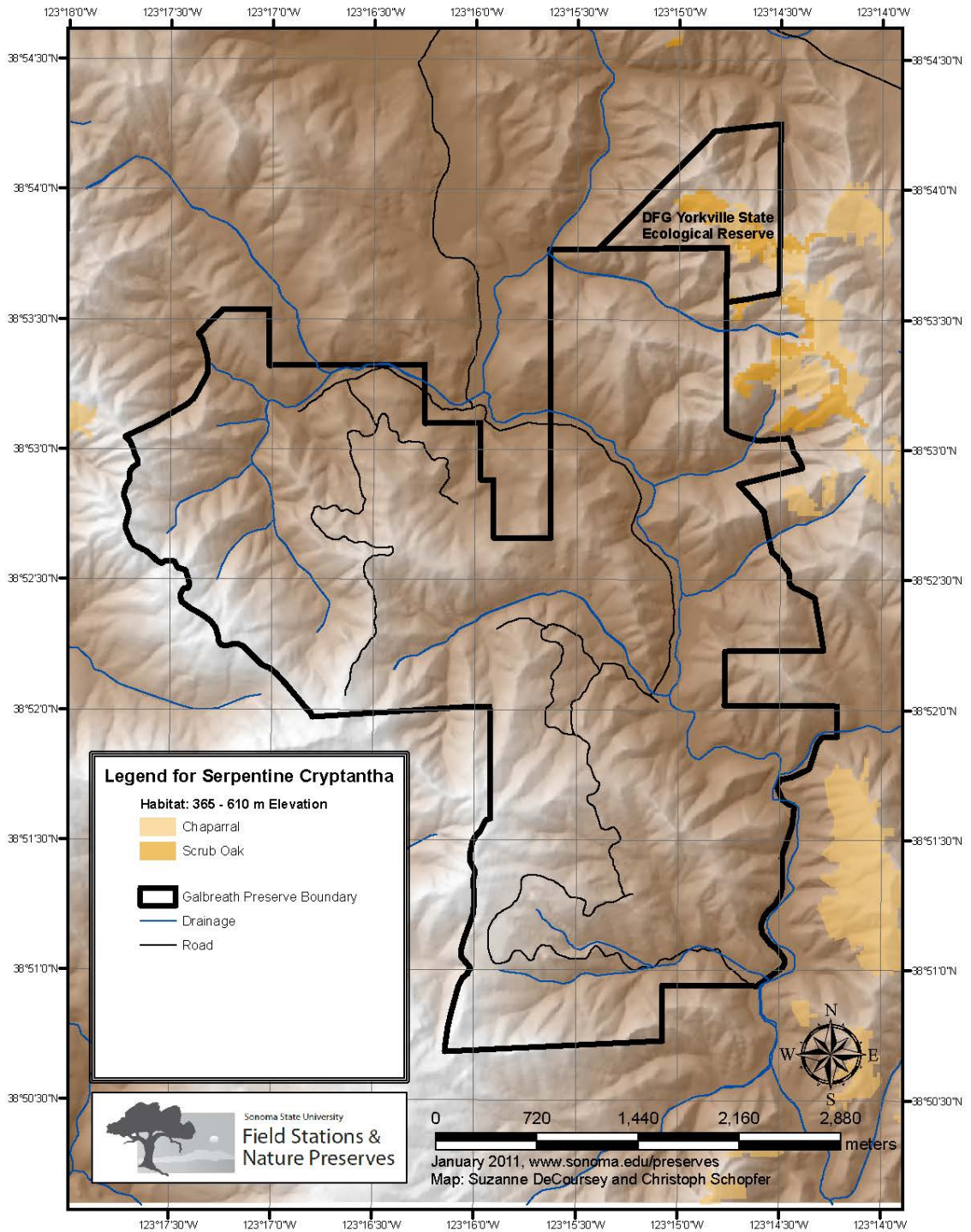
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Accessed 2010 Oct 4.

**Species Account Description:** Linden Schneider

Figure 22: Potential habitat for Serpentine Cryptantha (*Cryptantha clevelandii dissita*)



*Magnoliopsida (Flowering Plants): Brassicaceae*  
**Morrison's Jewel-flower (*Streptanthus morrisonii* ssp. *morrisonii*)**  
**Potential Occurrence: Not Expected to Occur**

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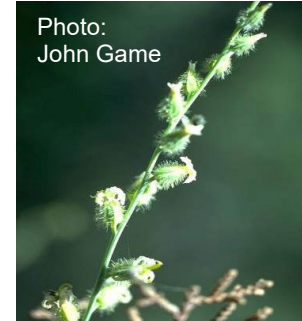
**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** Morrison's Jewel-flower is 50 cm to 1.2 m tall with a simple or branched stem (Hickman 1996). The leaves are unmottled, with the basal ones being oblanceolate, fleshy, petioled, toothed above middle, and green, and the cauline ones being lanceolate to ovate or spoon shaped, gradually reduced upwards (Hickman 1996; Little and Gerlach 2009). The flowers have bilateral, yellowish and nearly glabrous sepals and white to light yellow or brownish petals with the longest filament pair fused with sterile anthers (Hickman 1996). The fruit is a reflexed to erect silique which is narrowed between the winged seeds (Hickman 1996).

**Nomenclature:** *Streptanthus morrisonii* F.W. Hoffm. ssp. *morrisonii* Brassicaceae (USDA 2010)

Buck et al. (in Hickman 1993) do not recognize subspecies, noting that the species is variable, and that infraspecific taxa need detailed study. Roxanne Bittman, Botanist with the California Natural Diversity Database, reports that the subspecies of *S. morrisonii* are indeed distinct. Apparently, many field botanists are not aware that these subspecies exist and therefore don't know to key to this level. (From NatureServe 2009)

**Synonyms:** In the Jepson Manual [Ed. 1], this species is listed as a minor variant of *Streptanthus morrisonii* F.W. Hoffm. (Regents of the University of California 2010).

**Distribution:** This species occurs in the southern outer North Coast Range specifically in Sonoma County (Hickman 1996).

**Life History & Threats:** Morrison's Jewel-flower is a biennial herb blooming from May to September and is a strict serpentine endemic with 95% of occurrences on ultramafics (CNPS 2010; Calflora 2010).

The primary threat to Morrison's jewelflower is the loss of serpentine habitat within the range of the species through mining, off-road vehicle activity, and geothermal energy production (Dolan 1995). Morrison's jewelflower occurs on infertile serpentine and siltstone soils and exists within landscapes where wild fire and soil erosion are important disturbance agents. Roadside vegetation control may impact this species where populations occur adjacent to roads. (From Little and Gerlach 2009).

## **Habitat & Habitat Associations:**

*Vegetation Types:* Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches (CNPS 2010)

*Elevation:* 120 to 585 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

*Geology and Soils:* Rocky serpentine and siltstone soils (Little and Gerlach 2009) talus (CNPS 2010). Morrison's Jewel-flower is a strict serpentine endemic with 95% of occurrences on ultramafics (CNPS 2010; Calflora 2010).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- below 615 m elevation (a 30 m buffer on the known elevational occurrences of this species is included)
- chaparral (i.e. northern mixed chaparral or scrub oak)
- Possible best potential habitat is mapped as:
  - rocky soils (gravelly loam, cobbly loam or alluvium) from siltstone parent material
  - rocky soils (gravelly loam, cobbly loam or alluvium) from serpentine parent material

## **Potential Occurrence in the Study Area:**

*Habitat:* Habitat for this species, low-elevation chaparral with rocky serpentine or siltstone soil, is not present on the Galbreath Wildlands Preserve. Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.

### *Nearest Occurrence:*

Documented Occurrences in Study Area Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Study Area if Not Documented in Study Area – This species (*Streptanthus morrisonii* ssp. *morrisonii*) has not been recorded in Mendocino County, but is reported to the south (5 occurrences in Sonoma County) and east (17 occurrences in Lake and 1 occurrence in Glenn counties)(Calflora 2010) of Mendocino County. The nearest occurrence to the Preserve approximately 18 miles southeast at The Cedars in the Lower Russian River watershed (Best et. al. 1996). Distances among reported occurrences are up to 23 miles or more.

*Summary:* Morrison's Jewel flower in "Not Expected to Occur" in the Galbreath Wildlands Preserve because there is no potential habitat available.

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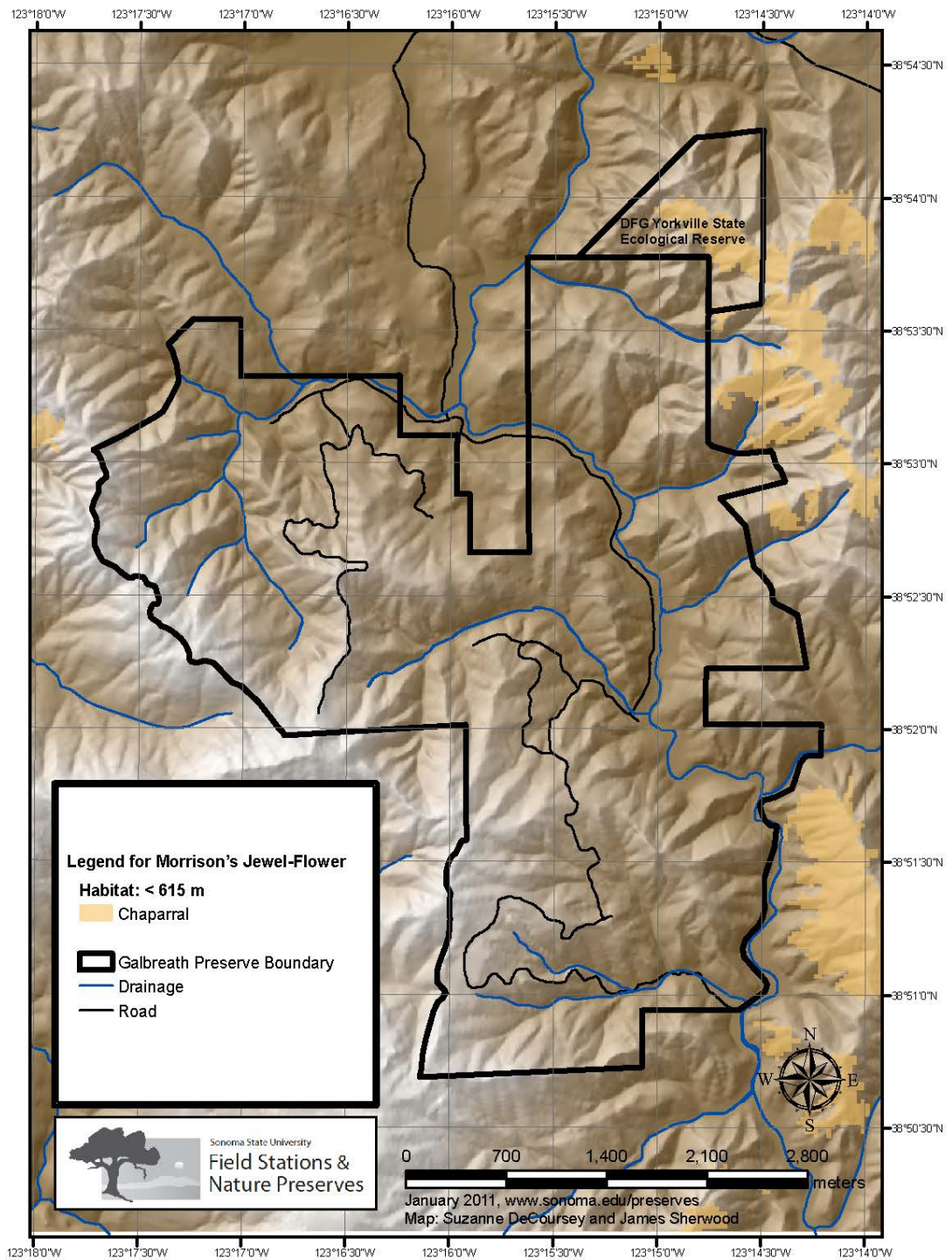
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**Author of this Species Account: Linden Schneider**



Figure 23. Potential habitat for Morrison's Jewel-Flower, *Streptanthus morrisonii* ssp. *morrisonii*



*Magnoliopsida (Flowering Plants): Brassicaceae*  
**Hoffman's Bristly Jewel-flower (*Streptanthus glandulosus* var. *hoffmanii*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.3

Other: BLM sensitive



**Species Description:** Hoffman's Bristly Jewel-flower has dense bristly stems 15 to 45 cm high (Rosatti 2008). The cauline leaves are moderately to sparsely bristly with entire to denticulate margins (eFloras 2008; Rosatti 2008). The inflorescence is a one sided raceme with a straight axis that is sparsely hairy to glabrous (Rosatti 2008). The flower has four lavender or rose to purple, sparsely hairy or glabrous, sepals 6 to 7 mm long and four lavender to more or less purple petals 20 to 12 mm long (Rosatti 2008). The fruit is a silique spreading to reflexed, recurved, sparsely hairy or glabrous (Rosatti 2008).

**Nomenclature:** *Streptanthus glandulosus* Hook. var. *hoffmanii* Kruckeb. Brassicaceae (Regents of the University of California 2010)

**Synonyms:** *Streptanthus glandulosus* Hook. subsp. *hoffmanii* (Kruckeb.) M.S.Mayer & D.W.Taylor (IPNI 2005)

**Distribution:** This species occurs in the southwest outer North Coast Ranges and is specifically known from the Austin Creek area of Sonoma County (eFloras 2008; NatureServe 2009; Rosatti 2008).

**Life History & Threats:** This species is an annual herb blooming from March to July (CNPS 2010). CNPS gives this species a state rank of SH, denoting that it is presumed extinct in California (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** This species is found in chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies and valley and foothill grassland dominated by introduced Mediterranean grasses and native herbs (CNPS 2010).

**Topography and Microclimates:** Rocky places (Best et al. 1996; CNPS)

**Elevation:** 120 to 475 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** Serpentine outcrops in grasslands or Franciscan formation outcrops (eFloras 2008; CNPS 2010)

*Species Associations:* Best et al. (1996) report an occurrence in the edge of a redwood (*Sequoia sempervirens*) grove.

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- below 505 m elevation (a 30 m buffer on the known elevational occurrences of this species is included)
- cismontane woodland (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)
- chaparral (i.e. Northern Mixed chaparral or scrub oak)
- grasslands

We additionally mapped best potential habitat in the areas identified above as:

- rocky soil (gravelly loam, cobbly loam or alluvium)

Available GIS soil data do not show serpentine soils as occurring in the Study Area (also see below).

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* The best potential habitat for this species in the Preserve is rocky soils and outcrops in low-elevation cismontane woodlands and grasslands. While some chaparral species (e.g., chamise) may occur as individuals on south-facing slopes, chaparral vegetation is known only from areas outside of the Preserve. The largest patch of potential habitat is cismontane woodland in the central eastern portion of the Preserve.

Rocky soils preferred by this species are patchily distributed throughout woodlands and grasslands; rocky outcrops have not been mapped in the Study Area. Field reconnaissance surveys indicated that Franciscan rocky outcrops are abundant in most vegetation types in the Preserve. Serpentine soils, while common regionally, are not identified by soils maps as occurring in the Study Area. To verify the lack of serpentine outcrops, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.

Based on the occurrence of appropriate vegetation types and the abundance of Franciscan rocky soils and outcrops, habitat quality is moderate to good quality.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is known from 8 occurrences south of the Preserve in Sonoma County (Calfora 2010). Distances

among reported occurrences are not available, although the species has been reported from 5 adjacent quads in Sonoma County (Arched Rock, Cazadero, Fort Ross, Warm Springs Dam, and Tombs Creek (Calflora 2010). The nearest occurrence is approximately 12 miles southeast of the Galbreath Wildlands Preserve in the Gualala River watershed (Calflora 2010).

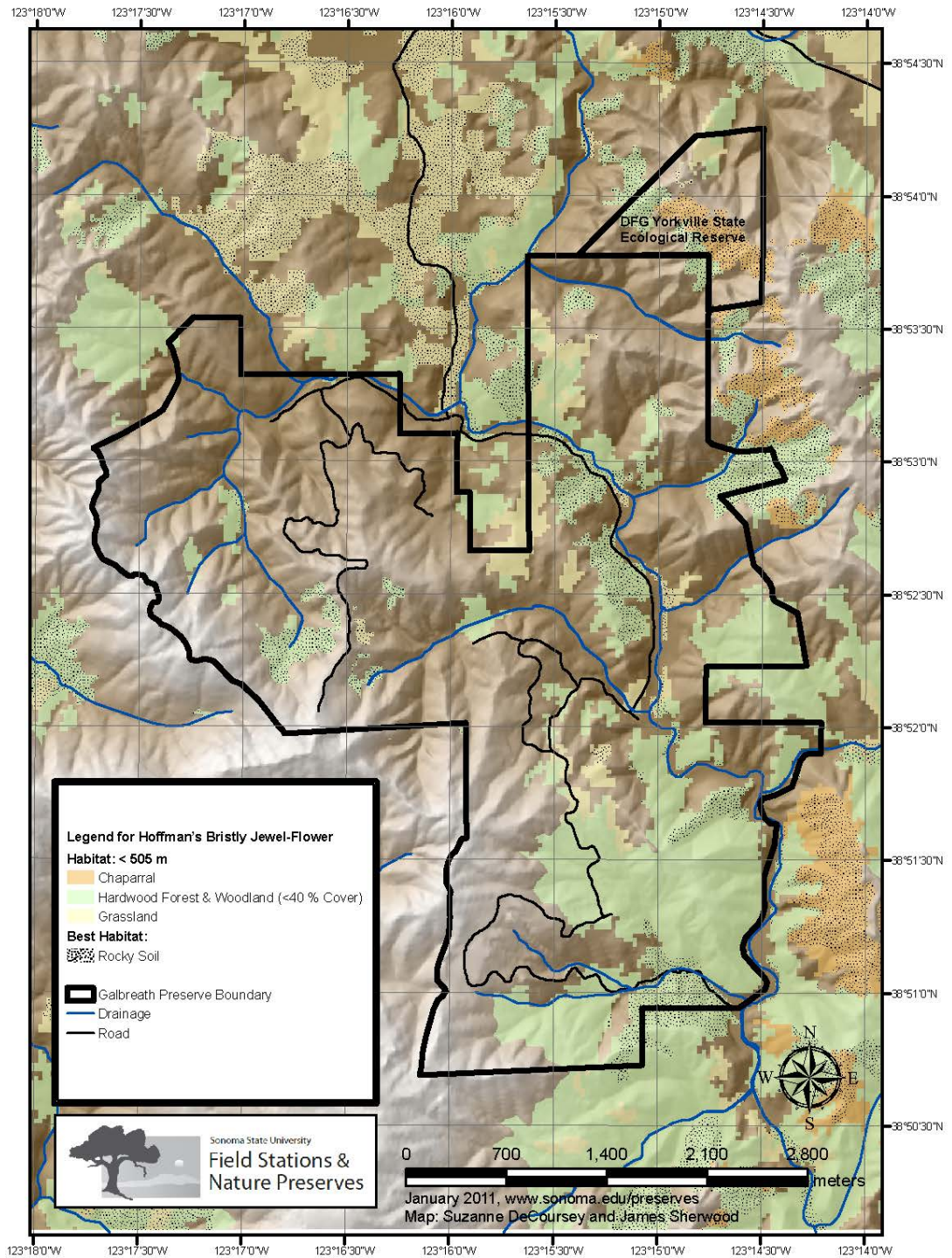
*Summary:* We anticipate this species to be “Unlikely to Occur”. Although habitat is moderate to good quality, Hoffman’s Bristley Jewel Flower is presumed extinct. An occurrence at the Preserve would constitute a northern range extension of its historic range.

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**Species Account Description:** Linden Schneider

Figure 24. Potential habitat for Hoffman's Bristly Jewel-Flower, *Streptanthus glandulosus* var. *hoffmanii*



*Magnoliopsida (Flowering Plants); Campanulaceae*  
**Swamp Harebell (*Campanula californica*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** Swamp Harebell is a stiffly recurved hairy herb clambering to a height to 10 to 30 cm with weak stems and has ovate, thin, crenate leaves with none to a short petiole (Hickman 1996, NatureServe 2009). The flower has a 20 mm long pedicle on which there are spreading sepals and a pale blue bell shaped corolla with a white papillate style. The fruit is a spheric capsule with basal pores and many 2 mm oblong seeds.

**Nomenclature:** *Campanula californica* (Kellogg) A. Heller (USDA 2011)

**Synonyms:** None

**Distribution:** The Swamp Harebell occurs in Mendocino, Marin and Sonoma Counties along the southern North Coast and is extirpated in Santa Cruz County along the northern Central Coast in elevations between 1 and 405 meters (CNPS 2010; Hickman 1996 NatureServe 2009).

**Life History & Threats:** This species is a perennial rhizomatous herb blooming from June to October (CNPS 2010).

Many occurrences have few plants. Threatened by competition, grazing, development, marsh habitat loss, logging, road maintenance, and trampling (CNPS 2010). In addition, exotic species and road construction are also threats; and foot traffic is a potential threat (CNDDDB 2003). (From NatureServe 2009)

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Habitat for this species is bogs and fens dominated by perennial herbs and low shrubs, freshwater marshes and swamps dominated by emergent, suffrutescent herbs adapted to seasonally or permanently saturated soils, and seeps dominated by dense grasses, sedges and herbs which thrive under seasonally moist to saturated conditions (CNPS 2010).

**Vegetation Types:** Habitat for this species is closed cone coniferous forests in which the dominating trees are serotinous-coned conifers, meadows dominated by dense grasses, sedges, and herbs, which thrive under seasonally moist to saturated conditions, and mesic

North Coast coniferous forests dominated by needle leaved evergreen trees (CNPS 2010). In addition this species is closely associated with the redwood region (Sholars and Golec 2007).

*Topography and Microclimates:* Forest openings (Sholars and Golec 2007). The species is shade intolerant and needs full to partial light (Sholars and Golec 2007).

*Elevation:* 1 to 450 meters (CNPS 2010) (The Study Area ranges from 200 to 740 m).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 480 m (includes a 30 m buffer on the known elevational occurrences for this species)
- north coast coniferous forest (i.e. Coastal Redwood, *Sequoia sempervirens* and Pacific Douglas Fir, *Pseudotsuga menziesii* vegetation types) with a canopy cover < 40%
- grasslands

Closed-cone conifers, bogs, fens, marshes and swamps do not occur on Preserve. Seeps and springs are abundant but data on their distribution are not available as a spatial datalayer.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Swamp Harebell occurs in wet, saturated areas in meadows and coniferous forests. Many of the habitats where this species typically occur (e.g., closed cone forests, bogs, fens, marshes and swamps) do not occur in the Preserve. The best potential areas inside Preserve boundaries are coniferous forests and seeps and springs in grasslands.

Habitat quality at these sites is poor to moderate. This species is threatened by logging, trampling and exotic species. The Preserve has a history of logging. Timber harvest plans indicate that both clear cut and selection cut methods were used to harvest Redwood, Douglas Fir, and hardwoods at least between 1988 and 2000. Trampling on the Preserve is mainly attributed to the abundant wild boar population that uses the springs and seeps for mud wallows. Exotic species also are known to occur in these wet areas.

Areas shown in Figure 25 overestimate the amount of habitat available, since seeps and springs are scattered within grassland areas. However, springs and seeps are common throughout the Galbreath Wildlands Preserve. Seeps typically occur in open grassy areas and are dominated by rushes (*Juncus* spp.), sedge (*Cyperus eragrostis*), mint (*Menthe pulegium*) and bracken ferns (*Pteridium aquilium*). Springs, sites with surface water, occur in many habitat types and vary in species composition.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve— This species is known from 53 occurrences in Mendocino County (Calflora 2010). It is confined to the western half of the county with all occurrences are west of the Preserve (Calflora 2010). One occurrence in Sonoma County extends Swamp Harebells' range east of the Preserve in the Warm Springs Dam quad (Calflora 2010). The nearest occurrence is approximately 9 miles southwest of the Galbreath Wildlands Preserve in the Gualala River watershed (Calflora 2010).

*Summary:* Swamp Harebell is “Unlikely to Occur” in the Preserve because habitat is poor to moderate, and occurrence at the Preserve would constitute an eastern range extension for this species in Mendocino County.

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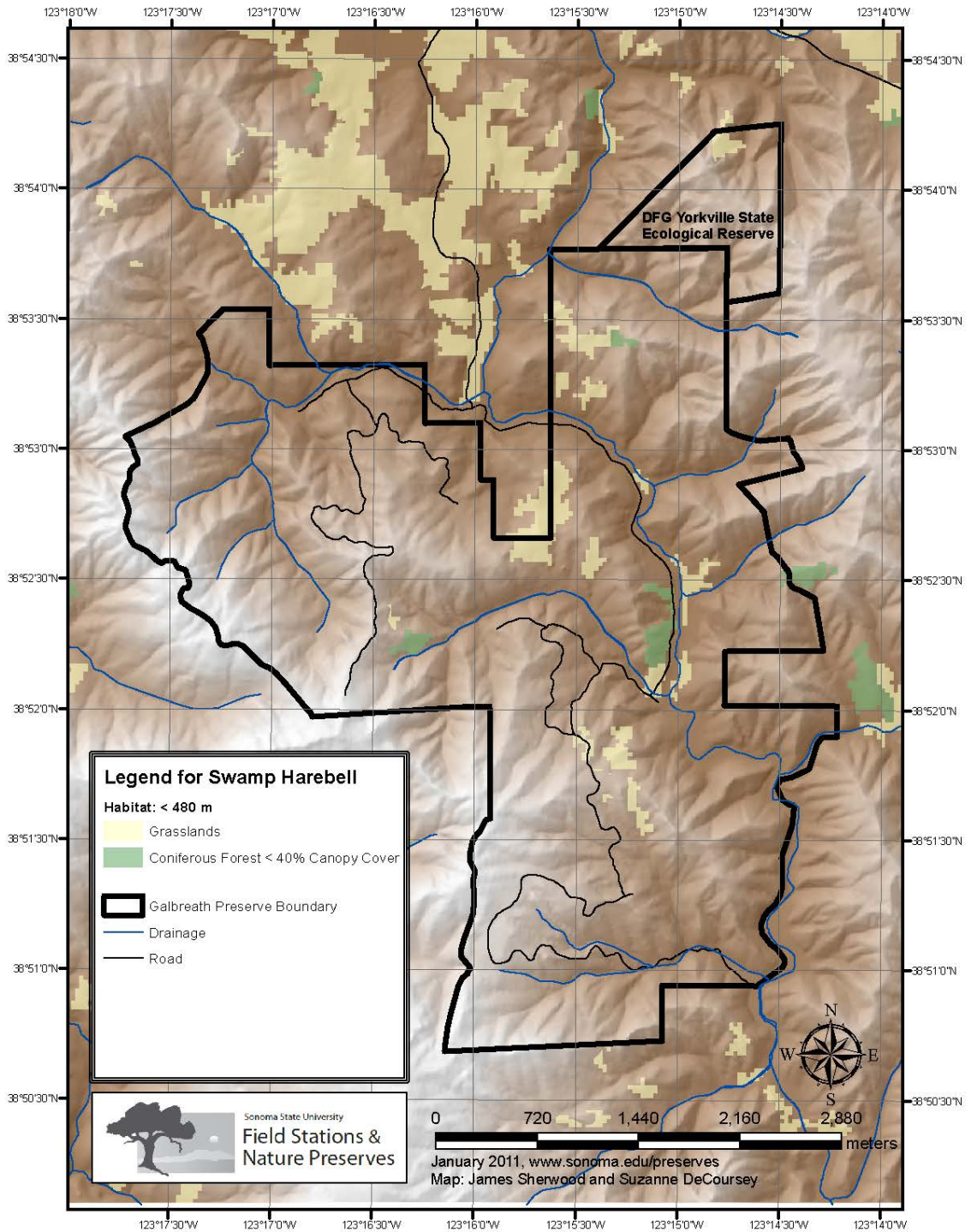
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**Species Account Description:** Linden Schneider



**Figure 25: Potential habitat for Swamp Harebell (*Campanula californica*)**



Magnoliopsida (Flowering Plants): Caprifoliaceae  
**Oval-leaved Viburnum (*Viburnum ellipticum*)**  
**Potential Occurrence: Likely to Occur**

**Status:**

Federal: None

State: None

CNPS: 2.3

Other: None



**SpeciesDescription:** The Oval-leaved Viburnum is slender, hairy and glandular with simple, deciduous, elliptic to round to cordate, coarsely dentate leaves that are 2 to 6 cm long (Hickman 1996). The inflorescence is a terminal, round to flat-topped, many flowered cyme with oblanceolate bracts and peduncles 1.5 to 4 cm long (Hickman 1996). The flower is saucer shaped with a white corolla, five stamens and a single chambered ovary with one ovule (Hickman 1996). The fruit is a 10 to 12 mm, elliptic, drupe with one 5 grooved seed (Hickman 1996).

**Nomenclature:** *Viburnum ellipticum* Hook. Caprifoliaceae (USDA 2010)

**Synonyms:** *Viburnum ellipticum* Hook var. *macrocarpum* Suksd. (USDA 2010)

**Distribution:** This species is found from Washington to California, where it occurs in the Northwest, the north and central Sierra Nevada Foothills and the San Francisco Bay Area (Hickman 1996).

**Life History & Threats:** The Oval-leaved Viburnum is a perennial shrub blooming from May to June and is threatened by habitat alteration (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this is species chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory, and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:** Sun to partial shade (Oregon State University 2002). Generally on north facing slopes (Hickman 1996).

**Elevation:** 215 to 1400 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Species Associations:** This species is known to associate with Oregon White Oak (*Quercus garryana*) and Poison Oak (*Toxicodendron diversilobum*) in Washington (Chappell 2006).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas in:

- chaparral (i.e. Northern Mixed chaparral)
- coniferous forest (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*) vegetation types) with a multi-storied canopy
- cismontane woodland (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover <40%).

We additionally mapped best potential habitat in the areas identified above as:

- north facing slopes (i.e., >8 deg slopes facing N, NE or NW)

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Habitat for Oval-leaved *Viburnum* in the Preserve is good quality and moderate in abundance. The best potential habitat for this species is coniferous forests and cismontane woodlands on north facing slopes. Chaparral, another vegetation type where this species can occur, does not occur within the Preserve. Potential habitat is patchily distributed throughout the Galbreath Wildlands Preserve. The largest contiguous portion of habitat is in the central part of the Preserve and is composed predominantly of cismontane woodlands. In this area, about half of lies on north facing slopes, providing best potential habitat for this species.

### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Oval-leaved *Viburnum* is known from areas north (3 occurrences in Humboldt County), south (15 occurrences in Sonoma County) and east (occurrences Lake, Glenn, and Tehama counties) of the Preserve (Calflora 2010). This species is known from 23 occurrences in Mendocino County (Calflora 2010). Distances among reported occurrences in Mendocino County can be as far as 12 miles (estimated from Calflora 2010 maps). The nearest occurrence is approximately 12 miles northeast of the Galbreath Wildlands Preserve in the Hopland quad in the Upper Russian River Watershed (Calflora 2010).

*Summary:* We anticipate this widespread species is “Likely to Occur” on the Preserve: habitat is good quality and abundant; the Preserve is bracketed by known occurrences to the north, south and east; and the species is documented to occur nearby (relative to distances observed among other documented occurrences).

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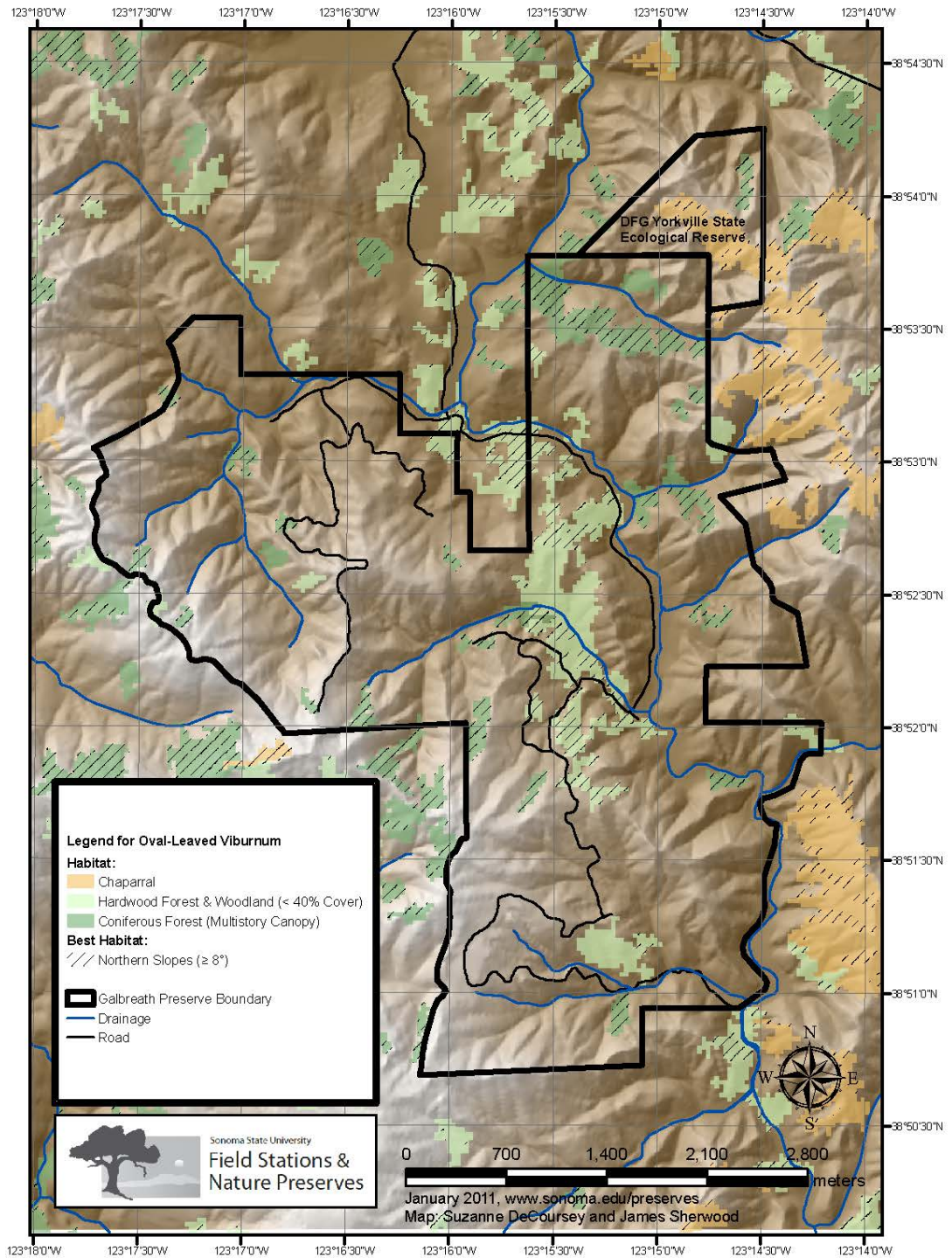
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**Species Account Description:** Linden Schneider

Figure 26. Potential habitat for Oval-Leaved Viburnum, *Viburnum ellipticum*



*Magnoliopsida (Flowering Plants): Convolvulaceae*  
**Three Fingered Morning Glory (*Calystegia collina* ssp. *tridactylosa*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: none

State: none

CNPS: 1B.2

Other: none



**Species Description:** The Three Fingered Morning Glory is densely tomentose and decumbent with long brownish hairs that is not or weakly climbing (Hickman 1996). The leaf is generally 3 cm at mid rib with 2 distinct basal lobes and a barley wavy margin (Hickman 1996). The inflorescence is solitary with linear elliptic to lanceolate bracts not fully enclosing the calyx (Hickman 1996). The flower is showy with tomentose sepals and a glabrous white corolla (Hickman 1996). The fruit is a spheric capsule with about 4 seeds (Hickman 1996).

**Nomenclature:** *Calystegia collina* (Greene) Brummitt ssp. *tridactylosa* (Eastw.) Brummitt Convolvulaceae (USDA 2010)

**Synonyms:** *C. tridactylosa*, (Hickman 1996)

**Distribution:** This species occurs in the North Coast Range particularly in Mendocino and Lake counties (Hickman 1996).

**Life History & Threats:** The Three Fingered Morning Glory is a rhizomatous perennial herb (CNPS 2010; Hickman 1996). It is a broad serpentine endemic with 85 to 94% of occurrences being on ultramafics (Calflora 2010). It is potentially threatened by geothermal energy development (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies, and oak-pine woodlands (CNPS 2010; Hickman 1996).

**Topography and Microclimates:** Open grassy or rocky areas (CNPS 2010; Hickman 1996)

**Elevation:** 0 to 600 m (CNPS 2010) (The Study Area ranges from 200 to 740 m).

**Geology and Soils:** Rocky, gravelly, or serpentinite (CNPS 2010; Hickman 1996). Heavy clay soil (Janeway 2002).

**Species Associations:** Found with Kellogg's yampah (*Perideria kelloggii*), hayfield tarweed (*Hemizonia congesta*), and aster species (*Lessingia* sp.) (Janeway 2002).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 630 m (includes a 30 m buffer on known elevational occurrences of this species)
- chaparral (including scrub oak) or woodlands (i.e. mixed or single dominant hardwoods with a canopy cover < 40%)

Best potential habitat was mapped as areas in the above vegetation types with:

- rocky (i.e., gravelly (gravelly loam, very gravelly loam, cobbly loam, very cobbly loam, or alluvium) or clay (i.e., clay loam) soils

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Best potential habitat in the Preserve for Three Fingered Morning Glory is woodlands with rocky or clay soils. This habitat type is present in the center and eastern portion of the Preserve.

Habitat quality is poor. While rocky and clay soils are abundant in woodland areas of the Preserve, this habitat type is not a common type for this species. Three Fingered Morning Glory occurrence is highly correlated with ultramafic soils, such as serpentine. To verify the lack of serpentine soils reported in the Preserve in GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar. In addition, chaparral, a common habitat type for this species, also does not occur in the Preserve.

### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: A previous site visit of the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010)

Nearest Occurrence to the Galbreath Wildlands Preserve: All reported occurrences for this species are to the east of the Preserve in Mendocino, Lake and Colusa counties (Calflora 2010). In Mendocino County, the species is known from 10 occurrences in four adjacent USGS quads in the northcentral region of the County. The nearest occurrence to the Preserve is 50 miles to the northeast in the Upper Eel River watershed (Calflora 2010).

*Summary:* Three Fingered Morning Glory is “Unlikely to Occur” in the Preserve because habitat quality is poor, occurrence at the Preserve would constitute a western range extension for the species, and the species has not been documented to occur nearby (relative to distances observed among other documented occurrences).

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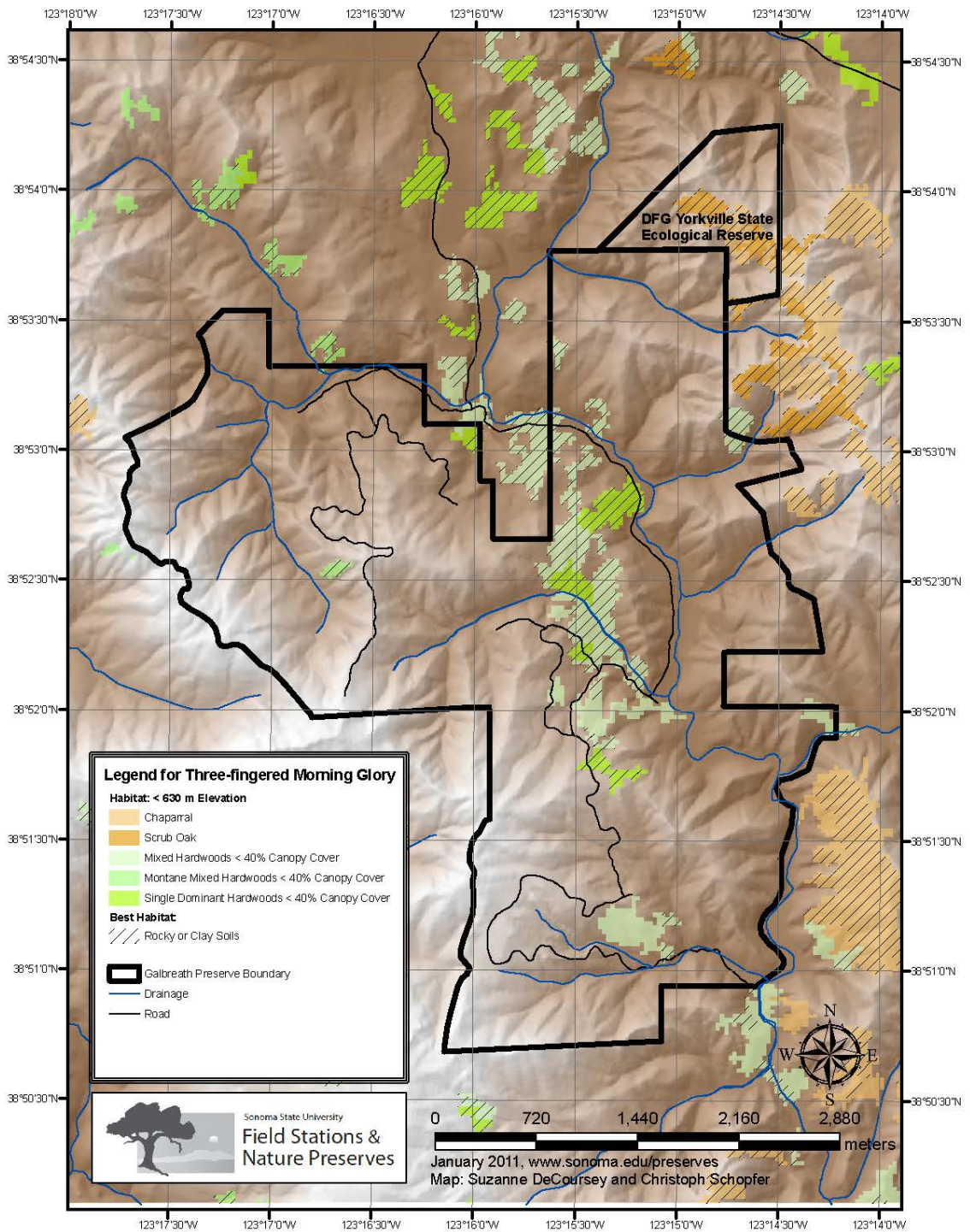
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**Species Account Description:** Linden Schneider



Figure 27: Potential habitat for Three-fingered Morning-glory (*Calystegia collina tridactylosa*)



*Magnoliopsida (Flowering Plants): Ericaceae*  
**The Cedars Manzanita (*Arctostaphylos bakeri* ssp. *sublaevis*)**  
**Potential Occurrence: Not Expected to Occur**

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**Status:**

Federal: None

State: Rare

CNPS: 1B.2

Other: None



Photos: Pete Veilleux

**Species Description:** The Cedars Manzanita has more or less spreading stems with puberulent to finely tomentose and finely glandular twigs (Hickman 1996). The leaf is appressed-puberulent with a 4 to 8 mm petiole, which has hairs like the twigs and the inflorescence is a panicle and has slender immature axes of 15 to 20 mm (Hickman 1996). The flowers are radial with 5 free, appressed sepals and a 5 lobed urn shaped, white to pink tinged corolla with 20 stamens (Hickman 1996). The fruit is 8 to 10 mm wide, strongly depressed and reddish brown with seeds 3 to 4 mm wide, ribbed and deeply wrinkled (Hickman 1996).

**Nomenclature:** *Arctostaphylos bakeri* Eastw. ssp. *sublaevis* P.V. Wells Ericaceae (USDA 2010)

**Synonyms:** None

**Distribution:** This species occurs in the outer North Coast Ranges of northern Sonoma County, specifically between the Cedars and Healdsburg (Hickman 1996).

**Life History & Threats:** The Cedars Manzanita is a perennial shrub blooming from February to May and is a strict serpentine endemic (Calflora 2010; CNPS 2010). This species is threatened by residential development and potentially by mining (NatureServe 2009).

**Habitat & Habitat Associations:**

**Vegetation Types:** The habitat for this species in closed cone coniferous forests in the which the dominating trees are serotinous-coned conifers and chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches (CNPS 2010)

**Topography and Microclimates:** ridges (Hickman 1996)

**Elevation:** 185 to 760 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** restricted to serpentine outcrops (Hickman 1996)

**Other Special Habitat Features:** serpentinite seeps (CNPS 2010)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- chaparral (i.e. Northern mixed chaparral vegetation and scrub oak)

No closed-cone conifers are known to occur in the Study Area.

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat Suitability:* Habitat for The Cedars Manzanita, chaparral with serpentine soils, is not present on the Galbreath Wildlands Preserve. Chaparral is only found outside of preserve boundaries and serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Galbreath Wildlands Preserve. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.

### *Nearest Occurrence:*

Documented Occurrences in Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: This species is only known from 17 occurrences in 5 adjacent USGS quads in Sonoma County (Calflora 2010). The nearest occurrence is approximately 13 miles south of the Galbreath Wildlands Preserve in the Tombs Creek Quad in the Gualala River watershed (Calflora 2010).

*Summary:* The Cedars Manzanita is “Not Expected to Occur” because there is no potential habitat in the Preserve.

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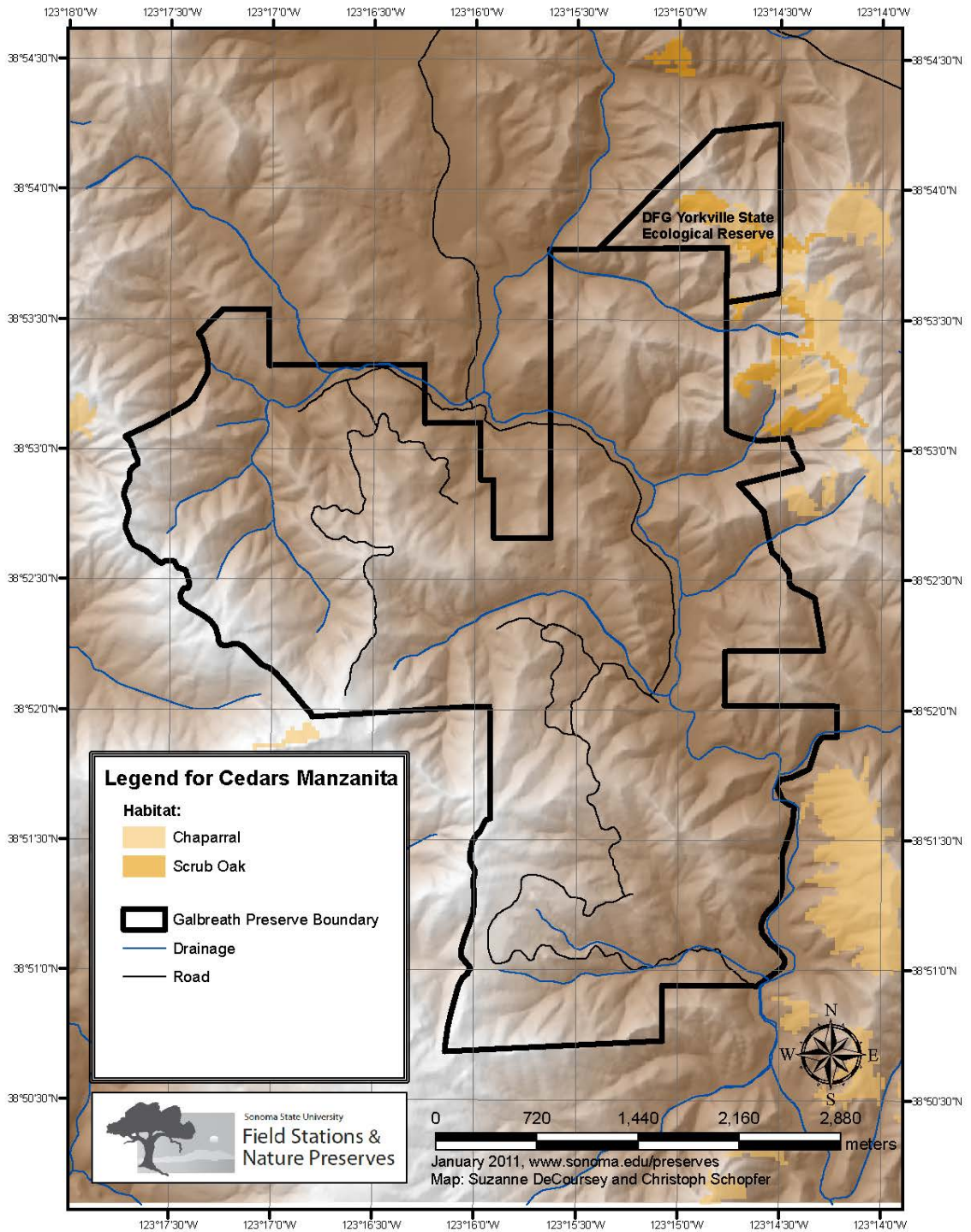
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**Species Account Description:** Linden Schneider

Figure 28: Potential habitat for Cedars Manzanita (*Arctostaphylos bakeri sublaevis*)



*Magnoliopsida (Flowering Plants): Ericaceae*  
**Sonoma Canescent Manzanita (*Arctostaphylos canescens* ssp. *sonomensis*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:**

The Sonoma Canescent Manzanita has no burl and densely short and soft hairy, finely glandular twigs with erect, glaucous, canescent, strigose leaves with a 3 to 10 mm petiole (Hickman 1996). The inflorescence is a raceme with finely glandular axes and pedicles with bracts 6 to 12 mm (Hickman 1996). The flowers are radial with 5 free sepals and a 5 lobed urn shaped corolla with 10 stamens and an ovary that is densely white-tomentose and sometimes glandular (Hickman 1996). The fruit is a 5 to 10 mm wide hairy drupe (Hickman 1996).

**Nomenclature:** *Arctostaphylos canescens* Eastw. ssp. *sonomensis* (Eastw.) P.V. Wells  
Ericaceae (USDA 2010).

**Synonyms:** *Arctostaphylos canescens* var. *sonomensis*, *Arctostaphylos sonomensis* (Calflora 2010)

**Distribution:** This species occurs in the western Klamath Ranges and the outer North Coast Ranges (Hickman 1996).

**Life History & Threats:** The Sonoma Canescent Manzanita is a perennial shrub flowering from January to June and is threatened by development and logging (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches and lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory (CNPS 2010).

**Topography and Microclimates:** dry rocky ridges and slopes (CNPS- North Coast Chapter 1997)

**Elevation:** 180 to 1675 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).

**Geology and Soils:** Strong serpentine indicator (64 to 74% of occurrences are on ultramafics) (Calflora 2010). Sometimes serpentinite (CNPS 2010). Volcanics in southern part of range (CNPS- North Coast Chapter 1997)

*Other Special Habitat Features:* Chaparral dominated vegetation with an open overstory (CNPS- North Coast Chapter 1997).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas in:

- chaparral (including scrub oak)
- coniferous forest (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var.*menziesii*) vegetation types) with an understory of mixed or single-dominant hardwoods

We additionally mapped the following attributes in the above areas as best potential habitat for this species as:

- rocky soils (i.e., very gravelly loam, gravelly loam, very cobbly loam, cobbly loam) on ridges (0 – 13 degrees) and south-facing slopes ((S, SE, or SW, > 7 degrees)

GIS soils data indicates no volcanic or serpentine soils occur in the Study Area.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* The best potential habitat in the Preserve for Sonoma Canescent Manzanita is rocky soils on south-facing slopes and ridgelines in multi-story coniferous forest. Dry rocky slopes and ridgelines are very limited in distribution within coniferous forest. The largest patch of best habitat is in the northeastern corner of the Preserve. However, rocky outcrops are abundant throughout the Study Area in most vegetation types and may be under-represented in the GIS layer.

Habitat quality is poor to moderate due to the lack of serpentine soils and chaparral. Sonoma Canescent Manzanita is highly associated with serpentine in the northern area of its range. To verify the lack of serpentine soils on the Preserve, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar. In addition, chaparral, a common habitat type for this species does not occur within Preserve boundaries.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Sonoma Canescent Manzanita is known from 15 occurrences in Mendocino County and is also found in counties to the north (Humboldt), east (Lake) and south (Sonoma) of Mendocino (Calflora 2010). The majority of occurrences in Mendocino County are in USGS quads to the east of the Preserve (Calflora 2010) although two occurrences are documented in the northwest corner of the County. The nearest occurrence to the Preserve is

approximately 13 miles to the northeast in the Upper Russian River watershed (Calflora 2010).

*Summary:* We anticipate this species to be “Unlikely to Occur” because habitat quality is poor to moderate, habitat is limited in abundance, occurrence at the Preserve would constitute a western expansion of this species range in southern Mendocino County.

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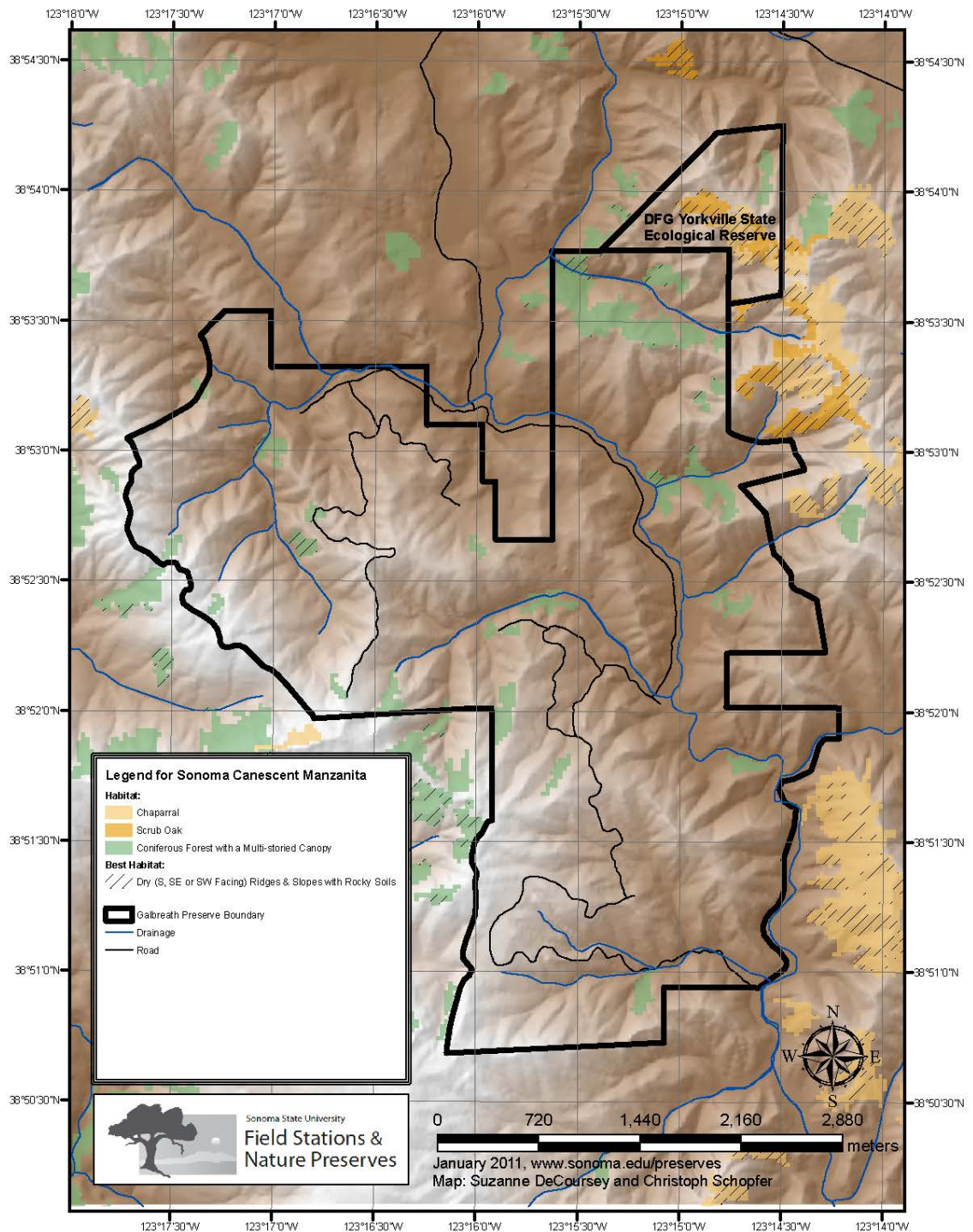
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**Species Account Description:** Linden Schneider



**Figure 29: Potential habitat for Sonoma Canescent Manzanita (*Arctostaphylos canescens sonomensis*)**



*Magnoliopsida (Flowering Plants): Ericaceae*  
**Rincon Ridge Manzanita (*Arctostaphylos stanfordiana* ssp. *decumbens*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal:  
None

State: None

CNPS: 1B.1

Other: None



**Species Description:** The Rincon Ridge Manzanita is decumbent with puberulent twigs and inflorescence axes (Hickman 1996). The leaves are erect, bright green and glabrous with a 4 to 8 mm petiole and the inflorescence is open with 3 to 5 branches and scale-like, deltate bracts (Hickman 1996). The flower is deep pink with a glabrous ovary and the fruit is glabrous and asymmetric measuring 6 to 8 mm wide (Hickman 1996).

**Nomenclature:** *Arctostaphylos stanfordiana* Parry ssp. *decumbens* (P.V. Wells) P.V. Wells  
Ericaceae (USDA 2010)

**Synonyms:** *A. stanfordiana* Parry var. *repens* Roof, *A. stanfordiana* Parry f. *decumbens*  
(Regents of the University of California 2010; IPNI 2005).

**Distribution:** This species occurs in the southern outer North Coast Ranges especially known from Rincon Ridge near Santa Rosa in Sonoma County (Hickman 1996).

**Life History & Threats:** The Rincon Ridge Manzanita is a perennial shrub blooming from February to April and is threatened by development, road construction vehicles and viticulture (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:** open areas, full sun (Theodore Payne Foundation 2009).

**Elevation:** 75 to 370 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** Rhyolitic soils in chaparral (CNPS 2010). Well draining soils (Theodore Payne Foundation 2009). Clay barrens (eFloras 2008).

This plant is highly restricted to red rhyolites. (From NatureServe 2009).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 400 m (includes a 30 m buffer on known elevational occurrences of this species)
- chaparral (including scrub oak) or cismontane woodland (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)

We additionally mapped best potential habitat in the areas identified above as:

- roads. Note that road margins are the only GIS data layer with relevance to “openings” in the Study Area, and other types of forest and chaparral openings could not be mapped.
- very well-drained soils. Very well drained soil are defined as those with the plurality of soil volume listed as “excessively drained” or “somewhat excessively drained” in soil survey reports.

Volcanic soils, to which red-rhyolitic soils belong, are not present in the Study Area.

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Habitat for this species is openings in chaparral and cismontane vegetation below 370 m. There is variability in information on soil type required by this species. Some sources indicate that the species is restricted to rhyolitic soils only, others indicate that it may occur on clay barrens or any well-drained soil. Although well-drained soils do occur sporadically in the Preserve, rhyolitic soils and clay barrens are not reported in the Preserve boundaries.

Habitat for Rincon Ridge Manzanita is:

- limited in distribution. Cismontane vegetation below 400 m is concentrated in the central portion of the Preserve.
- poor to moderate. Only one of the two habitat types used by this species, cismontane vegetation, is available in the Preserve boundaries. Chaparral does not occur on the Galbreath Wildlands Preserve. The quality of cismontane woodland may be poor relative to specific soil types needed by this species (i.e., rhyolite or clay pan), however a small portion of habitat lying adjacent to Rancheria Creek occurs on well-drained soils that could provide adequate quality habitat especially if these areas also have canopy openings. Openings can occur along roads (see map), but also as unmapped logging roads and areas with downed trees or sparse vegetation (unmapped).

*The Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: A previous site visit of the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010)

Nearest Occurrence to the Galbreath Wildlands Preserve: Rincon Manzanita has not been recorded from Mendocino County. This species is known only from counties to the south: 24 occurrences in Sonoma and 3 occurrences in Napa County (Calflora 2010). The nearest occurrence to the Preserve is approximately 16 miles to the southeast in the Warm Springs Dam quad in the Middle Russian River watershed

(Calflora 2010). Distances observed among reported occurrences can be as much as 18 miles or more (estimated from Calflora 2010).

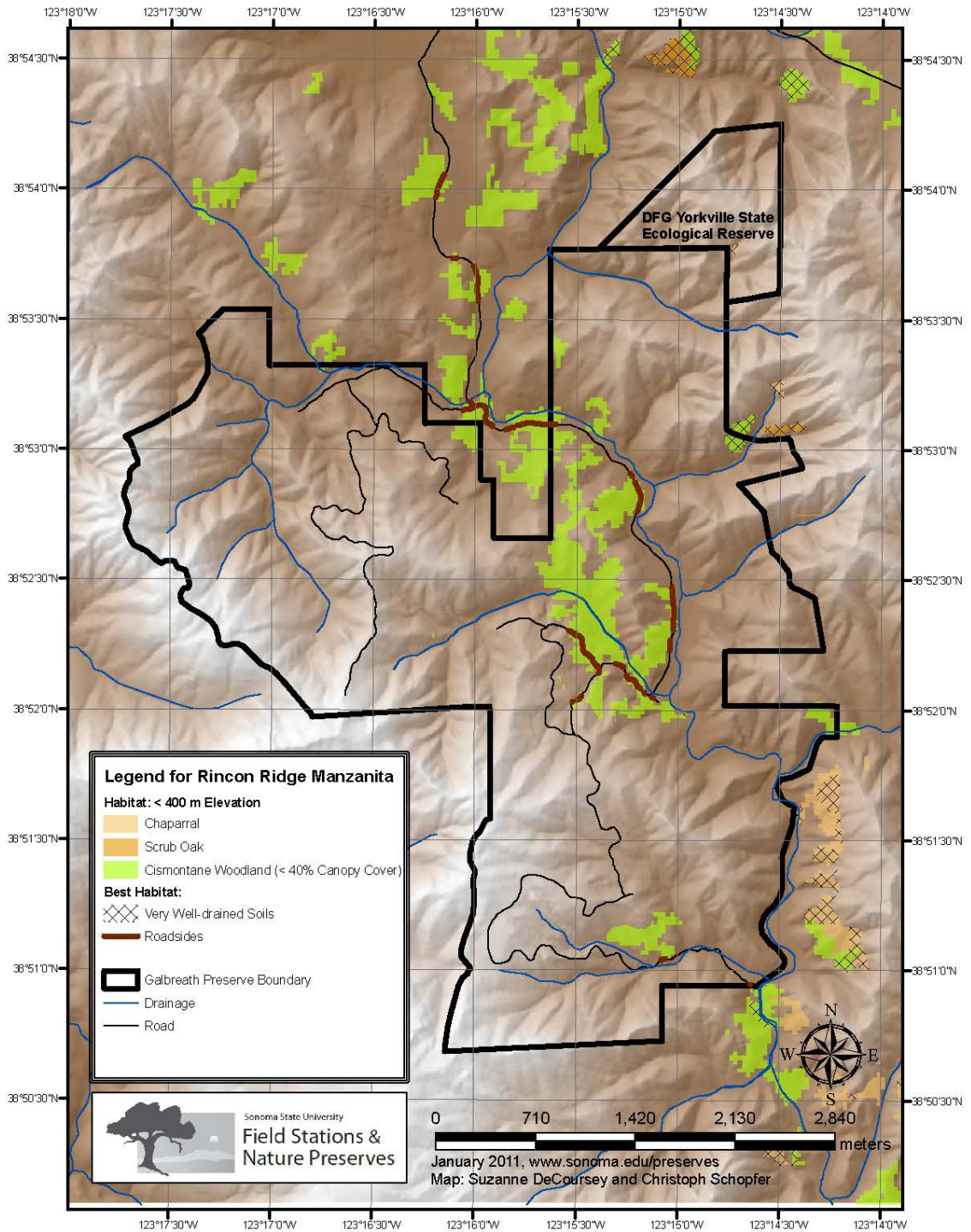
*Summary:* Rincon Ridge Manzanita is “Unlikely to Occur” at the Galbreath Wildlands Preserve because habitat quality is poor to moderate and limited in distribution, and occurrence at the Preserve would constitute a 16-mile northern range extension for this species. We note, however, that the distance from the Preserve to the nearest occurrence in Sonoma County is not unprecedented among reported occurrences of Rincon Ridge Manzanita.

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**Species Account Description:** Linden Schneider

Figure 30: Potential habitat for Rincon Ridge Manzanita (*Arctostaphylos stanfordiana decumbens*)



*Magnoliopsida (Flowering Plants): Ericaceae*  
***Raiche's Manzanita (Arctostaphylos stanfordiana ssp. raichei)***  
**Potential Occurrence: Likely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: None



**Species Description:** Raiche's Manzanita is spreading to erect with finely glandular and bristly twigs, bract and inflorescence axes (Hickman 1996). The leaves are erect, slightly glaucous, shiny, papillate, and rough (Hickman 1996). The midvein and margin are sparsely fine glandular and bristly, and the petiole is 4 to 8 mm (Hickman 1996). The inflorescence is open with 3 to 5 branches and scale-like; deltate bracts (Hickman 1996). The flower is deep pink with a glabrous ovary and the fruit is glabrous and asymmetric measuring 6 to 8 mm wide (Hickman 1996).

**Nomenclature:** *Arctostaphylos stanfordiana* Parry ssp. *raichei* W. Knight Ericaceae (USDA 2010)

**Synonyms:** none

**Distribution:** This species occurs in the southern outer North Coast Ranges in southern Mendocino County and western Lake County (Hickman 1996).

**Life History & Threats:** Raiche's Manzanita is a shrub blooming from February to April and is threatened by urbanization (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, and openings in lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory (CNPS 2010).

**Topography and Microclimates:** slopes and ridges (NatureServe 2009)

**Elevation:** 450 to 1,000 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** Strong indicator of serpentine soil, 65 to 74% of occurrences are on ultramafics (Calflora 2010). Rocky serpentine soils (CNPS 2010). Sandstone soils (Smith and Wheeler 1992).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- above 420 m elevation (includes a 30 m buffer around known elevational occurrences of this species)
- chaparral (including scrub oak)
- coniferous forest (i.e. Redwood-Douglas fir mix (Sequoia sempervirens-Pseudotsuga menziesii) and Pacific Douglas fir (Pseudotsuga menziesii var.menziesii) vegetation types) with a multi-storied canopy

We additionally mapped best potential habitat in the areas identified above as:

- roadsides. Note that road margins are the only GIS data layer with relevance to “openings” in vegetation, and other types of forest and chaparral openings could not be mapped.
- rocky soils (i.e., gravelly loam, cobbly loam, or alluvium) of sandstone (i.e., sandstone or greywacke) parent material
- ridges (0-13 deg on top of ridgelines) and slopes (> 7 deg)

Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area.

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* The best potential habitat in the Preserve for Raiche’s Manzanita is rocky sandstone soils on slopes and ridges in multi-story coniferous forests. Multi-story coniferous forest is extremely limited, with the largest contiguous patch on a steep rocky ridgeline in the northeastern corner of the Preserve. Roads were used as the best indicator of openings. However, not all roads are available in the GIS database and natural forest openings may also be abundant providing for an under estimation of best potential habitat within the very limited areas of appropriate vegetation.

Potential habitat is poor to moderate. Raiche’s Manzanita occurrence is highly correlated with serpentine soils which, while common regionally, are not indicated by GIS soil data as occurring in the Galbreath Wildlands Preserve. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar. Raiche’s Manzanita is also commonly found in chaparral which also does not occur within Preserve boundaries. However, the all of the multi-story coniferous forests on the Preserve are on slopes, ridges, or are dominated by rocky sandstone soils and these areas may support this species.

*Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Raiche’s Manzanita is known from 19 occurrences in Mendocino County and is also found in counties to the

east (Lake) and south (Sonoma) of Mendocino (Calflora 2010). The majority of occurrences in Mendocino County are to the east of the Preserve (Calflora 2010) although two USGS quads in the northwest corner of the County also contain occurrences. The nearest documented occurrence is in the Yorkville quad in the Upper Russian River watershed (Calflora 2010).

*Summary:* We anticipate this species to be “Likely to Occur” because, although potential habitat is poor to moderate in quality and highly limited in distribution, the species occurs nearby (relative to distances among other documented occurrences).

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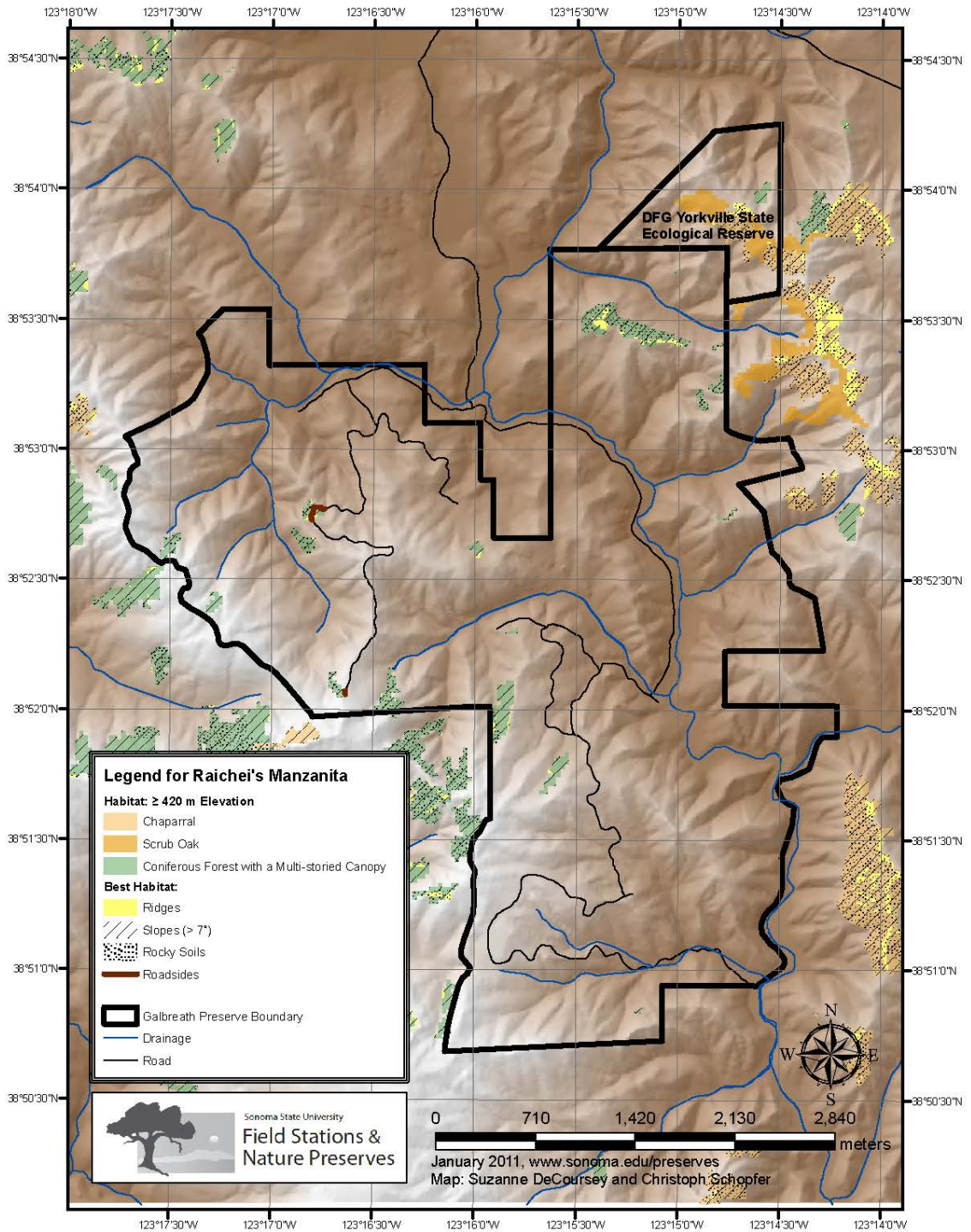
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**Species Account Description:** Linden Schneider



Figure 31: Potential habitat for Raiche's Manzanita (*Arctostaphylos stanfordiana raichei*)



*Magnoliopsida (Flowering Plants): Fabaceae*  
**Humboldt Milkvetch (*Astragalus agnicidus*)**  
**Potential Occurrence: Likely to Occur**

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**Status:**

Federal: None

State: Endangered

CNPS: 1B.1

Other: none



**Species Description:** Humboldt Milkvetch is generally glabrous with sparse hairs above its base, straw colored stems and odd, once pinnate, oblong to ovate leaves (Fremontia 1988; Hickman 1996). The inflorescence is a dense raceme, which may appear head or umbel like, with 10 to 40 flowers which become reflexed. The flower is papilionaceous with white petals and diadelphous stamens. The fruit is an ascending, curved legume with two chambers (Hickman 1996).

**Nomenclature:** *Astragalus agnicidus* Barneby Fabaceae (USDA 2010)

**Synonyms:** none

**Distribution:** This species was once thought to be extinct, but now is known to occur in the North Coast Range throughout Mendocino and southern Humboldt counties (Calflora 2010; Hickman 1996; NatureServe 2009)

**Life History & Threats:** This perennial herb is an early successional species (CPC 2010).

In a typical successional sequence, disturbance and/ or increased sunlight is followed by colonization, succession and, eventually, re-establishment of climax vegetation. In this sequence, the Humboldt milk-vetch could be expected to first prosper, then survive, and subsequently die out...It would be eventually represented only by seed that may remain dormant until some change in light or ground conditions trigger germination. Legumes in general and a number of *Astragalus* species do have long seed dormancy capability. (From Decker et al. 2002)

It is threatened by general habitat alteration, non-native species, grazing, competition, logging and road maintenance (CNPS 2010)

- Ecological succession (Pickart et al. 1991).
- Plant destruction because of toxic properties (Pickart et al. 1991).
- Extensive logging may actually harm populations (Bencie 2001). This may cause the stored soil seed bank to germinate all at once. Any subsequent destruction of plants would then prevent new seeds from being added to the seed bank.
- Herbicide spraying to control French Broom (Bencie 2001)
- Deer browsing removes flowers, thereby decreasing reproductive success (California Natural Diversity Database). (From CPC 2010)

## **Habitat & Habitat Associations:**

*Vegetation Types:* Habitat for this species is open soil (disturbed areas, sometimes roadsides) in upland forest dominated by evergreen or deciduous broadleaved trees more than 5 meters tall, and North Coast coniferous forests occurring in the wetter parts of the North Coast Ranges (Hickman 1996; CNPS 2010).

An early successional species, *Astragalus agnicidus* prefers disturbed sites such as logged ridges, open canopy wooded areas and scarified ground. (From CPC 2010)

*Topography and Microclimates:* Open, disturbed and roadside areas (CNPS 2010)

*Elevation:* 180 to 800 m (CNPS 2010) (The Study Area ranges from 200 to 740 m).

*Geology and Soils:* Seeds may survive in soil for long periods (Berg 1988). In the Jackson State Demonstration forest the Humboldt Milkvetch is found on soils of the Vandamme soil series which are deep well-drained soils formed from sandstone or mudstone (Decker 2002; USDA-NRCS 2003)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas with:

- cismontane (i.e., mixed, mixed montane, or single dominant hardwoods with canopy cover of 10-40%) or coniferous forest (i.e., Redwood-Douglas Fir or Pacific Douglas Fir vegetation) with a canopy cover < 40%.

Best potential habitat are areas in the above vegetation types with:

- roadsides
- well-drained sandstone soils (i.e., sandstone and graywacke soil types with “good” or “very good” drainage types)

Note that in the Study Area, the GIS layer for bare ground is confined to riverbanks along Rancheria Creek. Bare ground (potentially an area of best potential habitat for this species) as mapped in this data layer did not occur within the vegetation types identified for this species and does not appear on the map (Figure 32).

## **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Habitat for this early successional species (open, well-drained sandstone soils in upland and coniferous forests) mostly lies within the central areas of the Galbreath Wildlands Preserve. The GIS layer for bare ground is likely an underestimation since the bare ground layer describes only those areas along river banks.

Habitat quality for Humboldt Milkvetch is good. The Preserve has a history of disturbance required by this species. Timber harvest plans indicate that both clear cut and selection cut methods were used to harvest Redwood, Douglas Fir, and hardwoods at least between 1988 and 2000. Logging effects and logging roads have provided areas of bare ground and openings, which improves the quality and quantity of habitat for this species.

### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is known only from Mendocino (26 occurrences) and Humboldt (27 occurrences) counties (Calflora 2010). In Mendocino County, Humboldt Milkvetch is documented throughout the western half of the county from the southern to northern boundaries (Calflora 2010). All of these occurrences are to the west of the Preserve. The nearest occurrence to the Preserve is 16 miles to the southwest in Gualala in the Garcia River watershed (Calflora 2010).

*Summary:* Humboldt Milkvetch is “Likely to Occur” in the Preserve because habitat is good quality and abundant, and although an occurrence at the Preserve would be an eastern range extension for this species, the species is documented nearby (relative to distances among other documented occurrences).

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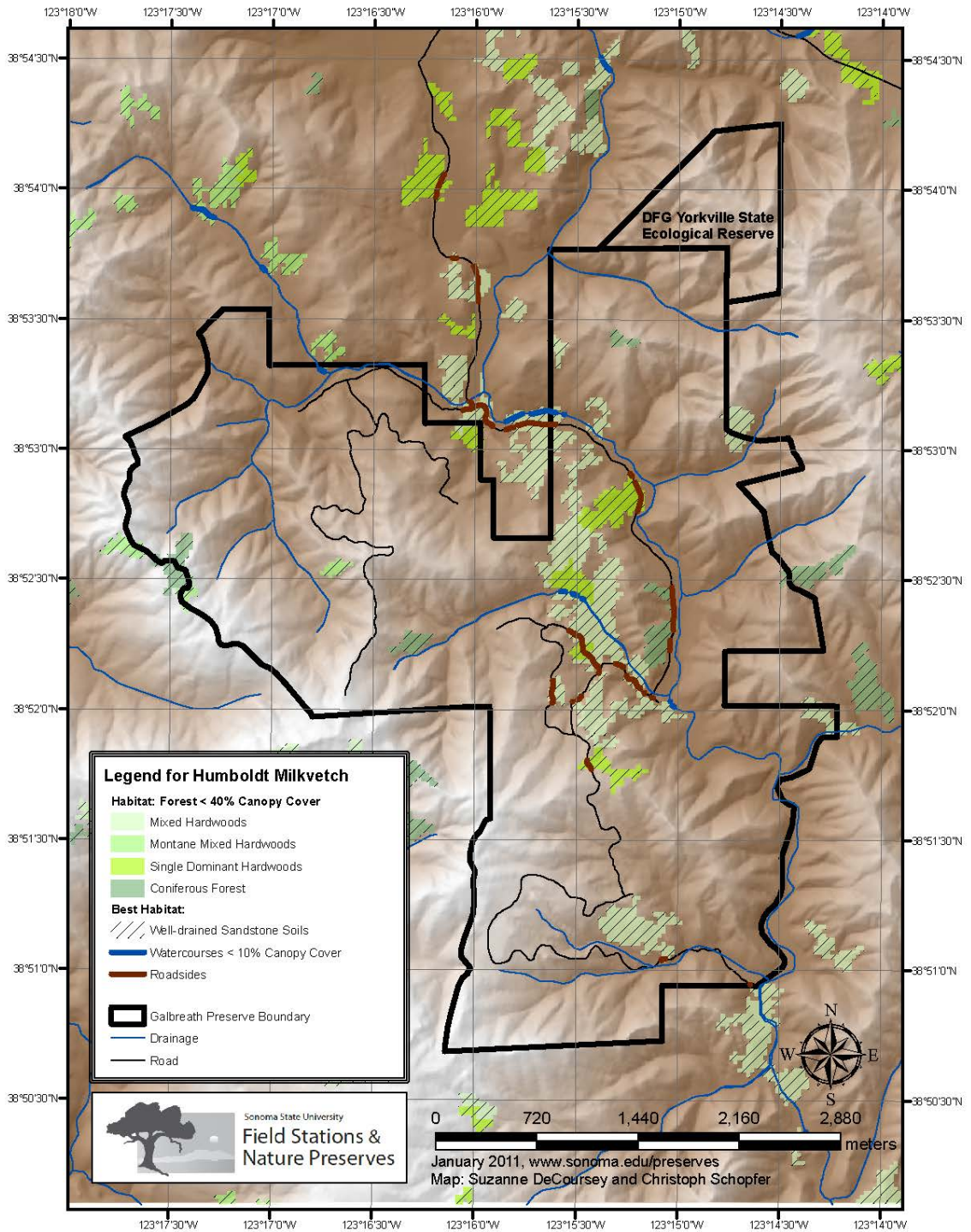
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**Species Account Description:** Linden Schneider

Figure 32: Potential habitat for Humboldt Milkvetch (*Astragalus agnicidus*)



*Magnoliopsida (Flowering Plants): Fabaceae*  
**Cobb Mountain Lupine (*Lupinus sericatus*)**  
**Potential Occurrence: Likely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



Photo: Cheryl Burton



Photo: Jorg Fleige

**Species Description:** The Cobb Mountain Lupine is silvery to gray green with short appressed hairs and grows 15 to 50 cm high with cauline leaves clustered at base and leaflets widely spoon shaped (Hickman 1996). The inflorescence is a 10 to 30 cm long raceme, which can be open or dense with whorled deciduous flowers (Hickman 1996). The flowers are papilionaceous and purple to violet with the upper keel margins ciliate from claw to tip (Hickman 1996). The fruit is a 2 to 3 cm hairy legume with 3 to 7 light brown seeds (Hickman 1996).

**Nomenclature:** *Lupinus sericatus* Kellogg Fabaceae (USDA 2010)

**Synonyms:** none

**Distribution:** This species is found in the southern inner North Coast Ranges in Lake, Napa, Colusa, Sonoma, and Mendocino Counties (Hickman 1996; Calflora 2010). This species has also been documented in the outer North Coast Ranges (CalFlora 2010).

**Life History & Threats:** The Cobb Mountain Lupine is a perennial herb blooming from March to June and is threatened by geothermal development, habitat alteration, logging, road maintenance, road widening, and herbicides (CNPS 2010)

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is broadleaved upland forest dominated by evergreen or deciduous broadleaved trees more than 5 meters tall, chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:** open, wooded slopes (Hickman 1996) and disturbed sites (CNPS 2010; NatureServe 2010).

**Elevation:** 275 to 1,525 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study area was mapped as areas:

- coniferous forest (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var.*menziesii*) with a multi-storied canopy
- broadleaved upland forest (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover > 40%).
- cismontane woodland (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover < 40%).
- chaparral (i.e. Northern Mixed Chaparral or scrub oak)

We additionally mapped possible best potential habitat in the areas identified above as areas with:

- open canopy (< 40% canopy cover) on slopes (> 8 deg)
- disturbance (i.e., roadsides).

Note that roadsides are the only GIS data layer that corresponds to “disturbance” in the Study Area, and other types of disturbance could not be mapped.

There was insufficient area below 245 m elevation within the study area to warrant using this elevational cutoff; therefore, elevation was not used to model the potential distribution of this species.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Cobb Mountain Lupine occurs in chaparral, woodlands and forests, often occurring on open slopes and disturbed areas.

Habitat for this species is moderate to good. No chaparral occurs in the preserve and habitat is confined to cismontane woodlands, broadleaved upland and coniferous multistoried forest. Open slopes are generally abundant and moderate to high levels of disturbance on the Preserve may benefit this species. The Preserve has a history of logging. Timber harvest plans indicate that both clear cut and selection cut methods were used to harvest Redwood, Douglas Fir, and hardwoods at least between 1988 and 2000 and many temporary roads were created to harvest timber. In addition, a large Wild Boar population regularly turns over soil in many areas with woodlands and forests.

#### *Nearest Occurrence:*

Documented Occurrences in Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: This species is known from 2 occurrences in Mendocino County (California 2010). The nearest occurrence is approximately 5 miles southeast of the Galbreath Wildlands Preserve in the Big Foot Mountain Quad in the top of the Middle Russian River watershed (California 2010). Occurrence of this species on the Galbreath Wildlands Preserve would be a small



eastern range extension relative to observed distances among known occurrences in other areas of California (Calflora 2010).

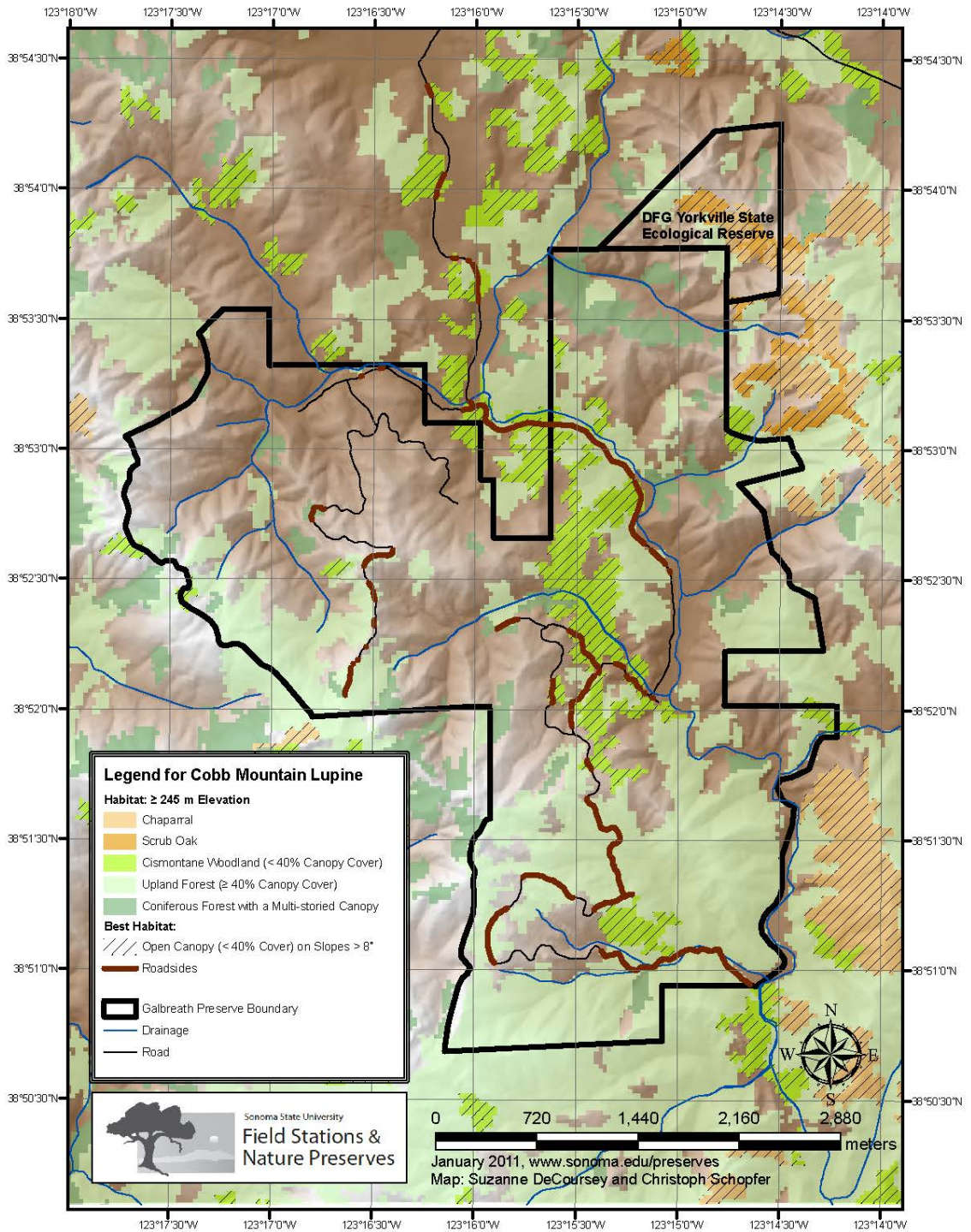
*Summary:* We anticipate the Cobb Mountain Lupine to be “Likely to Occur” because potential habitat is of moderate to good quality and the Preserve lies within the distributional range of this species.

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**Species Account Description:** Linden Schneider

Figure 33: Potential habitat for Cobb Mountain Lupine (*Lupinus sericatus*)



*Magnoliopsida (Flowering Plants): Fabaceae*  
**Robust False Lupine (*Thermopsis robusta*)**  
**Potential Occurrence: Unlikely to Occur**

**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



Photo: Ellen Tatum



Photo: Jennifer L. Kalt

**Species Description:**

The Robust False Lupine stands 80 cm to 1.8 m tall and is erect with green to gray hairs and stout stems branching at base (Rosattii 2008). The leaves are palmate compound, with dense, long, soft, wavy hairs with three leaflets 6 to 11 cm long (Rosattii 2008). The inflorescence is a 20 to 45 cm terminal raceme with 3 to 5 pedicles per node (Rosattii 2008). The flowers are papilionaceous and yellow (Rosattii 2008). The fruit is a curved and spreading legume with dense hairs (Rosattii 2008).

**Nomenclature:** *Thermopsis robusta* Howell Fabaceae (USDA 2010)

**Synonyms:** *Thermopsis macrophylla* Hook. & Arn. (Regents of the University of California 2010)

Not in The Jepson Manual (1993) (From CNPS 2010)

**Distribution:** This species occurs in Northern California in the Klamath and Outer North Coast Ranges (Rosattii 2008).

**Life History & Threats:** The Robust False Lupine is a rhizomatous perennial blooming from May to July (Rosattii 2008; CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is broadleaved upland forest dominated by evergreen or deciduous broadleaves trees more than 5 meters, North Coast coniferous forests dominated by needle leaved evergreen trees, and in meadows (CNPS 2010; NatureServe 2010).

**Topography and Microclimates:** Ridge tops in North Coast Coniferous forest, openings along ridges in the Lower Montane Coniferous Forest and Broadleaved Upland Forest habitat types, open places in the Mixed Evergreen Forest and Foothill Woodland plant communities (CNPS-NCC 1997)

**Elevation:** 150 to 1,500 m (CNPS 2010) (The Study Area ranges from 200 to 740 m).

**Geology and Soils:** often along roads and serpentine transition areas (CNPS-NCC 1997) or shale (Rosattii 2008)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- Broadleaved upland forests (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover >40%)
- North Coast coniferous forests (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*) vegetation types).
- Grasslands

We additionally mapped best potential habitat in the areas identified above as:

- Ridgetops
- Roadsides in broadleaved and north coast coniferous forest types. (Note that road margins are the only GIS data layer with relevance to “openings” in the Study Area, and other types of forest and chaparral openings could not be mapped).
- Shale parent material. Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a water bar.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Habitat for Robust False Lupine, openings in hardwood and coniferous forests or grasslands, comprises the majority of the Galbreath Wildlands Preserve. Openings in the vegetation are underestimated. The only openings mapped were along roads. Many other openings occur, such as unmapped logging roads and areas with downed trees or sparse vegetation, but could not be mapped.

Overall habitat quality for this species is good and relatively abundant in the Preserve. While serpentine soils do not occur in the Preserve, shale-based soil parent material is widespread. The best potential areas for this species, where roads, ridgetops, and shale-based soils all co-occur, are most abundant in the southwestern corner of the Preserve.

#### *Nearest Occurrence:*

Documented Occurrences in Galbreath Wildlands Preserve: A previous site visit of the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010). However, *T. macrophylla* was found. Chen et al. (1994) describes *T. robusta* as superficially similar to *T. macrophylla* stating that these two species have been treated as the same.

Nearest Occurrence to Galbreath Wildlands Preserve: This species is known from 4 counties in north coastal California. Two occurrences have been recorded in the literature from Mendocino County (Calflora 2010) but the species is most abundant in Humboldt and Siskiyou counties. The nearest occurrence is documented

approximately 60 miles northwest of the Galbreath Wildlands Preserve in the South Fork Eel River watershed (Calflora 2010). Occurrence of this species on the Galbreath Wildlands Preserve would be an extension of its range southeast by 60 miles. (Note that *T. macrophylla*, which some sources lump with *T. robusta*, is a widespread species occurring in 27 counties in northern and southern California).

**Summary:** Robust False Lupine is “Unlikely to Occur” in the Preserve. While habitat is good quality and abundant, occurrence at the Preserve would constitute a 60 mile southern range extension for this species.

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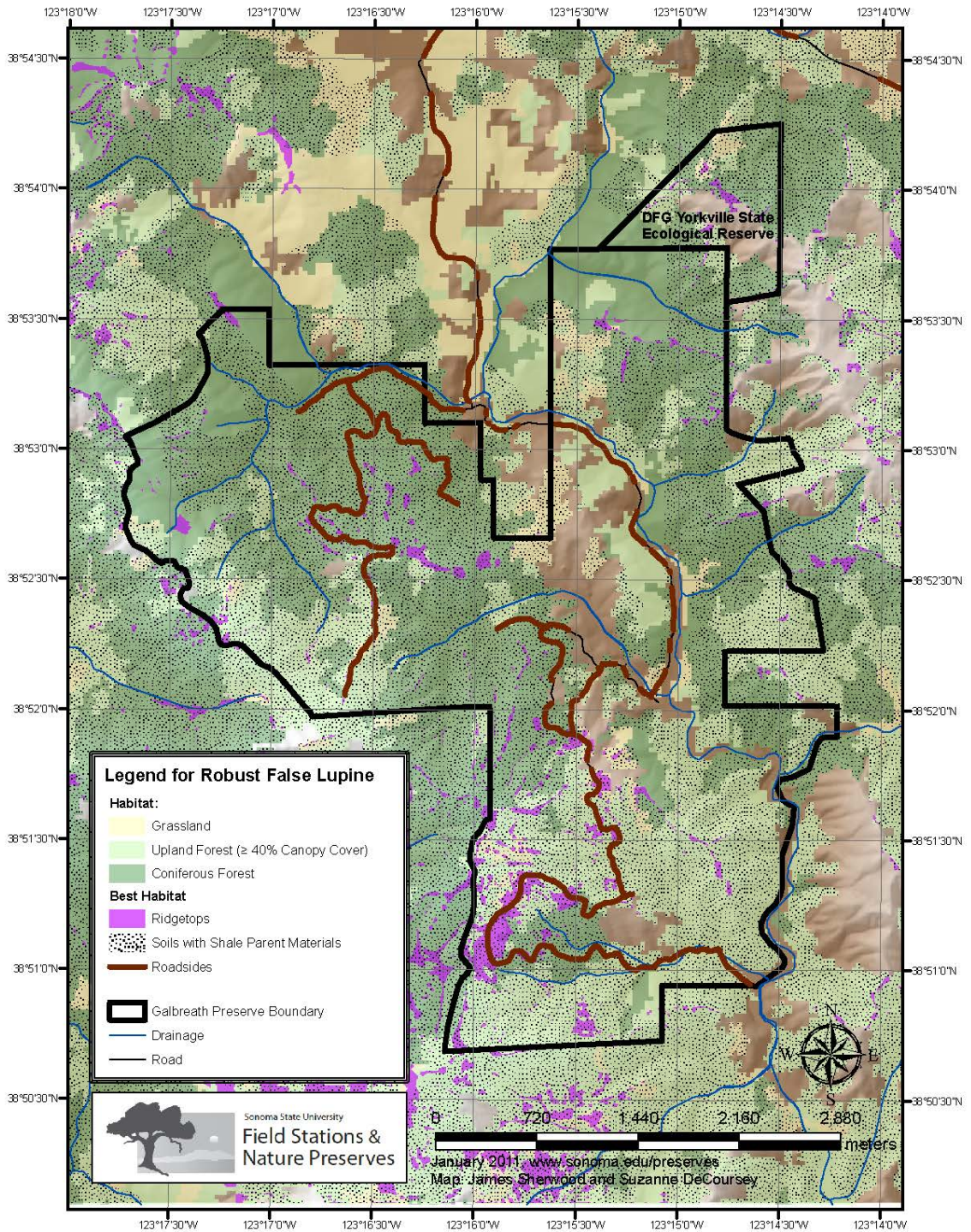
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**Species Account Description:** Linden Schneider

Figure 34: Potential habitat for Robust False Lupine (*Thermopsis robusta*)



*Magnoliopsida (Flowering Plants): Fabaceae*  
**Santa Cruz Clover (*Trifolium buckwestiorum*)**  
**Potential Occurrence: Known to Occur**

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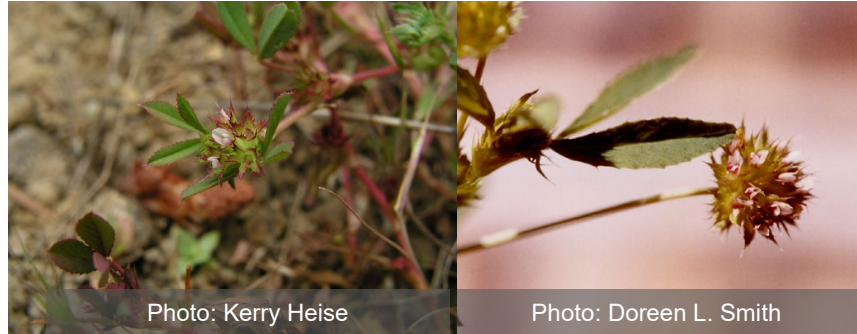
**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: None



**Species Description:** The Santa Cruz Clover is glabrous with a decumbent to ascending stem and cauline, palmately compound leaves with three, elliptic to obovate, finely serrate leaflets (Hickman 1996). The inflorescence is head like, 8 to 12 mm wide with 5 to many flowers and a bowl shaped, irregularly cut involucre (Hickman 1996). The flowers are pale pink to white and papilionaceous with a 10-veined calyx with 3 to 5 tiny lateral teeth ending in a bristle (Hickman 1996). The fruit is an indehiscent legume with 1 to 2 seeds (Hickman 1996).

**Nomenclature:** *Trifolium buckwestiorum* Isely Fabaceae (USDA 2010)

**Synonyms:** None

**Distribution:** This species occurs in Monterey, Santa Cruz, San Mateo, Sonoma and Mendocino Counties between 105 and 610 m elevation (CNPS 2010).

**Life History & Threats:** The Santa Cruz Clover is an annual herb blooming from April to October (CNPS 2010).

Grazing, land clearing, non-native plants, development, and feral pigs (Bittman 1998). Considered endangered throughout its small range by CNPS (2001); only one occurrence is fully protected. (From NatureServe 2009)

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** vernal moist swales (Elkhorn Slough Coastal Training Program 2006).

**Vegetation Types:** Habitat for this species is broadleaved upland forest dominated by evergreen or deciduous broadleaved trees more than 5 meters tall, and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:** Grassy or waste areas (Hickman 1996). Gravelly, margins (CNPS 2010). Moist areas on margins of broadleaved upland forest (County of Monterey Planning and Building Inspection Department 2008)



Most occurrences in grassy areas; often in damp places such as wet drainages near roads, shallow depressions/winter-wet spots in grasslands, a moist grassland on a level canyon bottom (California Dept. of Fish and Game 2000). (From NatureServe 2009)

*Elevation:* 105 to 610 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

*Geology and Soils:* clay rich upland soils (Elkhorn Slough Coastal Training Program 2006)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 640 m elevation (includes a 30 m buffer around known elevational occurrences for this species).
- broadleaved upland forest (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover > 40%).
- cismontane woodlands (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)

We additionally mapped possible best potential habitat in the areas identified above as:

- clay rich soils (clay loam)
- roadsides

Note that road margins are the only GIS data layer with relevance to “openings” in the Study Area, and other types of forest and chaparral openings could not be mapped.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Santa Cruz Clover occurs on moist, clay-rich soils in grassy areas of coastal hardwood woodlands and forests. Habitat quality for this species is moderate in the Preserve due the presence of invasive species and an extensive wild boar population, both of which are threats to the Santa Cruz Clover.

Potential habitat is most abundant and of highest quality on the southern half of the Preserve due to the abundance. Because this species is found only in moist areas of hardwood forest and woodland, Figure 35 overestimates the amount of habitat.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Santa Cruz Clover was found at 20 roadside sites (~9,000 individuals) in 2013 (Geri Hulse-Stevens, Kerry Heise, pers. comm; location and abundance data available from SSU Preserve staff). Note that these data are not shown on the attached map.

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is known from 8 occurrences to the north and south of the Preserve in Mendocino County (Calflora 2010). The nearest occurrence is approximately 10 miles northwest of the Galbreath

Wildlands Preserve in the Zeni Ridge quad in the Navarro River watershed (Calflora 2010).

*Summary:* The Santa Cruz Clover is “Known to Occur” at the Preserve.

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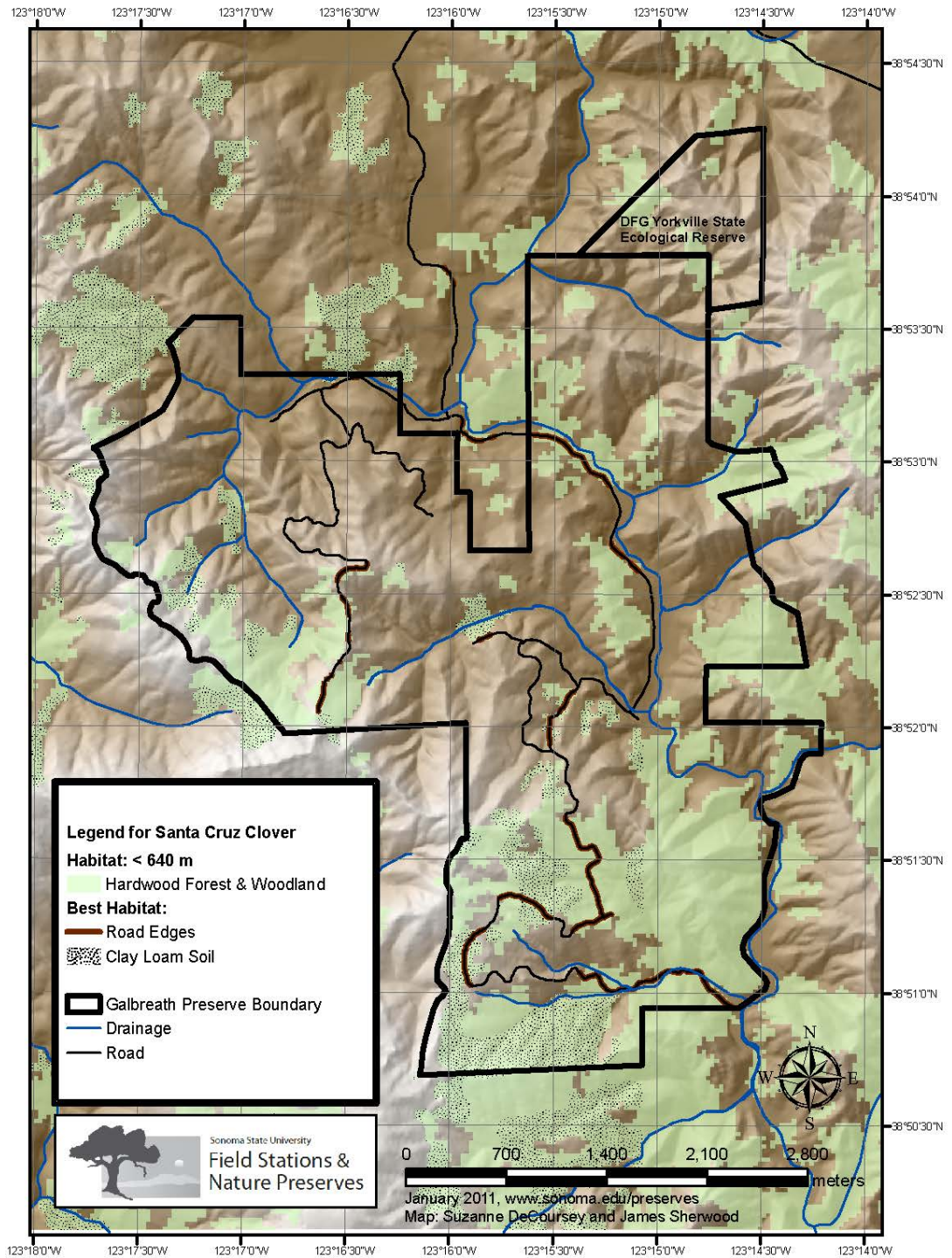
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**Species Account Description:** Linden Schneider

Figure 35. Potential habitat for Santa Cruz Clover, *Trifolium buckwestiorum*



*Magnoliopsida (Flowering Plants): Juglandaceae*  
**Northern California Black Walnut (*Juglans hindsii*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: None



Photo: Saint Mary's College of California



Photo Neal Kramer

**Species Description:**

The Northern California Black Walnut has one main trunk generally 15 to 25 m high with smooth, gray to brown bark that furrows with age and odd, once pinnate, deciduous leaves (Hickman 1996). The staminate inflorescence is a catkin with four calyx lobes, which are more or less fused to the bract (Hickman 1996). The pistillate inflorescence has four calyx lobes also fused to the bract or bractlets which forms the fleshy husk of the fruit, a nut 3 to 3.5 cm in diameter (Hickman 1996).

**Nomenclature:** *Juglans hindsii* (Jeps.) Jeps. ex R.E. Sm. Juglandaceae (USDA 2010)

**Synonyms:** *Juglans californica* S. Watson var. *hindsii* Jeps. (Regents of the University of California 2010)

**Distribution:** Due to the horticultural value of this species its distribution is varied, but in northern California it is listed as rare (Smith and Wheeler 1992). In addition the 'native' status of this species is questionable (CNPS 2010).

Hickman (1996): *J. californica* var. *hindsii*: south Inner North Coast Ranges, south Sacramento Valley, north San Joaquin Valley, San Francisco Bay Area

CNPS (2010):

Only one confirmed, native occurrence appears viable as of 2003. Sizes and sites of trees in occurrences on quad 532C indicate they are historical; however further study is needed to determine native status. Reported as possibly present in BUT Co. (575C), but native status questionable. Widely naturalized in cismontane CA. (From CNPS 2010)

Calfora (2010): Occurrence records are shown throughout the state of California.

NatureServe (2009):

Only two of the three native stands of *Juglans hindsii* are still extant in California. It is widely naturalized in central and northern California. (From NatureServe 2009)

**Life History & Threats:** The Northern California Black Walnut is a monoecious, deciduous tree which blooms from April to May (CNPS 2010; Hickman 1996). It is threatened by

hybridization with orchard trees, urbanization, lack of reproduction, and conversion to agriculture (CNPS 2010; NatureServe 2009)

#### **Habitat & Habitat Associations:**

*Aquatic Habitat Types:* Along rivers and streams (NatureServe 2009).

*Vegetation Types:* Habitat for this species is riparian forest dominated by broadleaved winter deciduous trees forming closed canopies and associated with perennial streams, and riparian woodland dominated by broadleaved winter deciduous trees with open canopies and associated with streams (CNPS 2010). Occasionally on somewhat drier slopes within foothill woodland and Yellow Pine forest communities (NatureServe 2009). Also found in wet meadows (Smith and Wheeler 1992).

*Topography and Microclimates:* Canyons and Valleys (Hickman 1996)

Given no specific additional requirements, grows especially well in **zones 4, 5, 6, 7, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24**. Given moderate summer watering, grows in zones 8, 9, 10, and 11. (From Jepson Horticultural Database 2006)

*Elevation:* 0 to 600 m (CNPS 2010; Smith and Wheeler 1992). (The Study Area ranges from 230 to 710 m in elevation).

*Geology and Soils:* rocky, gravelly well drained soil (NatureServe 2010)

*Species Associations:* Broadleaved riparian winter deciduous trees, Yellow Pine Forest (CNPS 2010; NatureServe 2009).

**Conceptual Basis for GIS Model Development:** Suitable habitat in the Study Area was mapped as;

- below 630 m elevation (includes a 30 m buffer around known elevational occurrences for this species)
- riparian woodland and forest (i.e. Fremont cottonwood (*Populus fremontii*) and a 130-m buffer surrounding disjunct riparian vegetation along Rancheria Creek)
- foothill woodland (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover < 40%). (Yellow pines do not occur in the Study Area).

We additionally mapped possible best potential habitat in the areas identified above as:

- rocky soils (gravelly loam, cobbly loam or alluvium)
- well drained soil (drainage good or very good)

#### **Potential Occurrence on the Galbreath Wildlands Preserve:**

*Habitat:* Northern California Black Walnut occurs in well-developed winter-deciduous riparian woodlands and forests along perennial streams, and occasionally in cismontane woodlands.

Habitat quality for this species within the Preserve is poor. Riparian vegetation is not found in areas with perennial water. The mainstem of Rancheria Creek is seasonal and riparian vegetation (woodland and scrub only) is patchily distributed along open erosional banks. Perennial streams draining into Rancheria Creek run through narrow canyons and are dominated by conifers and hardwoods which are not potential habitat for this species.

*Nearest Occurrence:*

Documented Occurrences on the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve This species is known from 4 occurrences in Mendocino County (Calflora 2010). The nearest occurrence is approximately 12 miles northeast from the Study Area on the U.C. Hopland Research and Extension Center in the Upper Russian River watershed (Calflora 2010). Distribution of this species is sparse often with great distances in between documented occurrences.

*Summary:* Northern California Black Walnut is unlikely to occur on the Preserve because habitat quality is poor.

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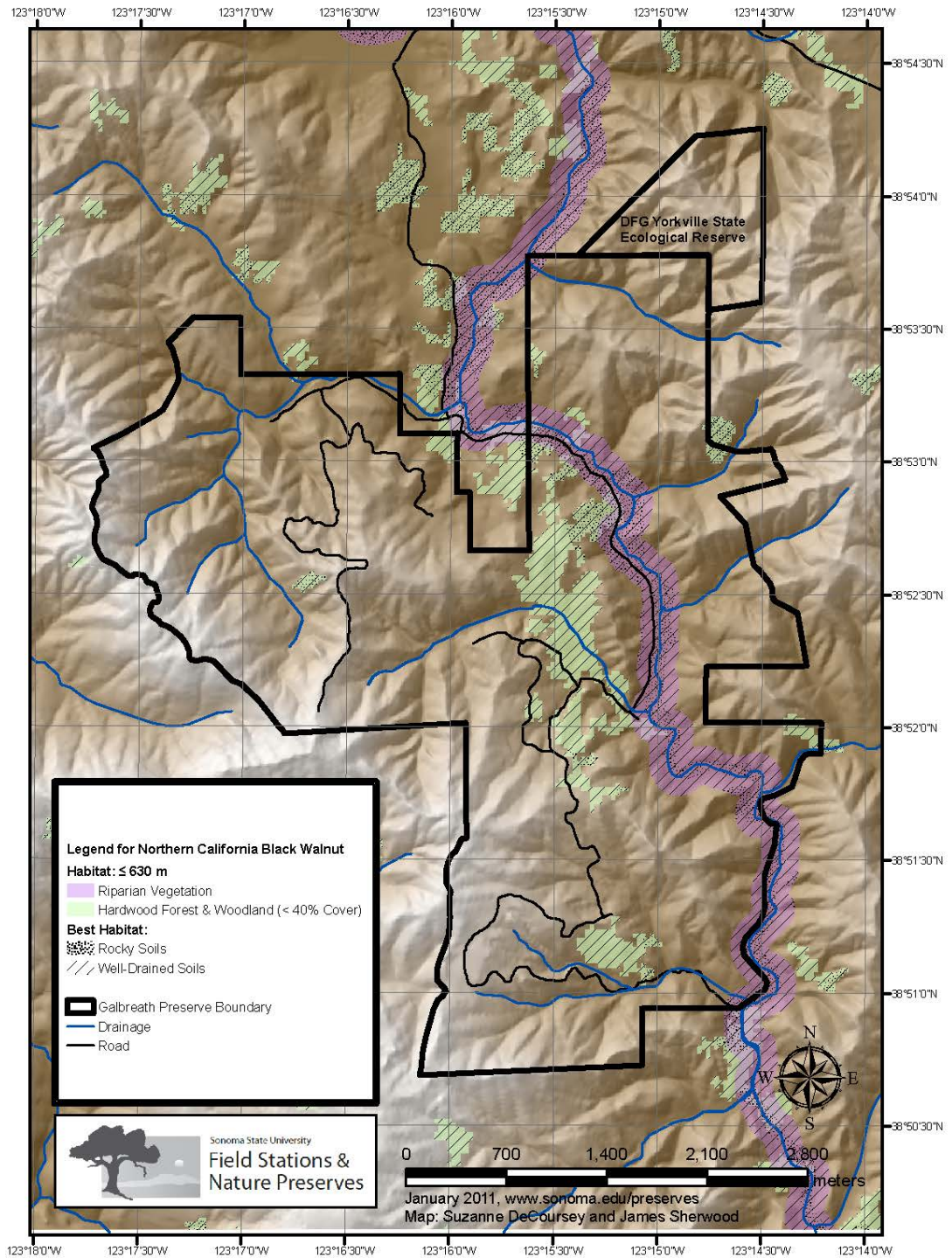
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**Species Account Description:** Linden Schneider

Figure 36. Potential habitat for Northern California Black Walnut, *Juglans hindsii*





*Magnoliopsida (Flowering Plants): Lamiaceae*  
**Robust Monardella (*Monardella villosa* ssp. *globosa*)**  
**Potential Occurrence: Likely to Occur**

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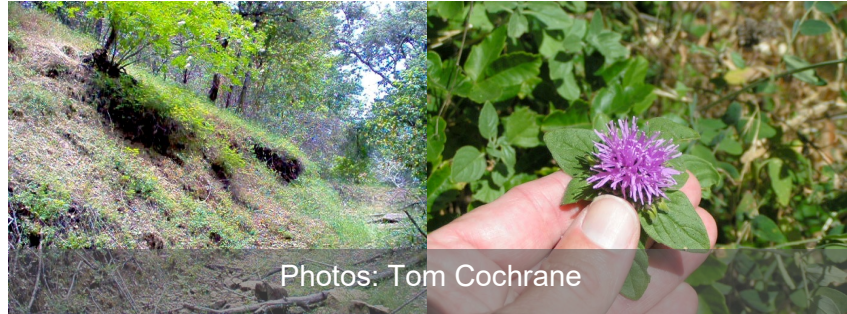
**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** The Robust Monardella grows to 50 cm high with none or more or less dense wavy soft and unbranched hairs (Hickman 1996). The leaves are 10 to 22 mm and ovate with entire to serrate margins, an obtuse base and a wooly to sparsely hairy lower surface (Hickman 1996). The inflorescence is a 10 to 30 mm wide head with outer bracts 8 to 20 mm wide (Hickman 1996). The flower has a pink to purple corolla with a shaggy, glandular hairy calyx (Hickman 1996). The fruit is composed of four nutlets generally ovoid to oblong and smooth (Hickman 1996).

**Nomenclature:** *Monardella villosa* Benth. ssp. *globosa* (Greene) Jokerst Lamiaceae (USDA 2010).

**Synonyms:** none

**Distribution:** This species occurs in the outer North Coast Ranges and the San Francisco Bay Area between 100 and 915 m (CNPS 2010; Hickman 1996).

**Life History & Threats:** This perennial rhizomatous herb blooms from June to July and rarely into August (CNPS 2010). Threats to this species may include rural development, pig rooting, and competition from non-native grasses (Santa Clara Valley Habitat Plan 2008)

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is openings in broadleaved upland forest dominated by evergreen or deciduous broadleaves trees more than 5 meters tall, chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branch, cismontane woodlands dominated by trees that are deciduous, evergreen or both with open canopies, valley and foothill grasslands dominated by introduced Mediterranean grasses and native herbs, and coastal scrub (CNPS 2010).

**Topography and Microclimates:** openings and along trail margins in forest and chaparral (Santa Clara Valley Habitat Plan 2008)

**Elevation:** 100 to 915 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** rocky soils sedimentary in origin (Ruygt 2008)

**Species Associations:**

Other plants associated with robust monardella... are coast live oak (*Quercus agrifolia*), poison oak (*Toxicodendron diversilobum*), pacific pea (*Lathyrus vestitus*) ponderosa pine (*Pinus ponderosa*), madrone (*Arbutus menziesii*), Douglas fir (*Pseudotsuga menziesii*), California bay (*Umbellularia californica*), black oak (*Q. kelloggii*), canyon live oak (*Q. chrysolepis*), valley oak (*Q. lobata*), blue oak (*Q. douglasii*), big-leaf maple (*Acer macrophyllum*), manzanita species (*Arctostaphylos* sp.), California buckeye (*Aesculus californica*), creeping snowberry (*Symphoricarpos mollis*), California bedstraw (*Galium californicum*), rough-leaved aster (*Aster radulinus*), and blue wildrye (*Elymus glaucus*) (California Natural Diversity Database 2006). (From Santa Clara Valley Habitat Plan 2008)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- chaparral (i.e. northern mixed chaparral or scrub oak)
- broadleaf upland forest (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover >40%)
- cismontane woodlands (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)

In mapping this species' potential habitat, the naming conventions found in this description ("broadleaf upland" vs. "cismontane") were kept.

- grasslands

We additionally mapped possible best potential habitat in the areas identified above as:

- road margins.
- sedimentary soils (i.e., soils with sedimentary rock parent material (sandstones, shale or siltstone) that were rocky (gravelly loam, cobbly loam, or alluvium)

Note that road margins are the only GIS data layer with relevance to "openings" in the Study Area, and other types of forest and chaparral openings could not be mapped.

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

Habitat for this species is openings in broadleaved upland forest dominated by evergreen or deciduous broadleaves trees more than 5 meters tall, chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branch, cismontane woodlands dominated by trees that are deciduous, evergreen or both with open canopies, valley and foothill grasslands dominated by introduced Mediterranean grasses and native herbs, and coastal scrub (CNPS 2010).

*Habitat:* Robust Monardella occurs on rocky sedimentary soils in open areas of grasslands, coastal scrub, chaparral, and hardwood woodlands and forests. Habitat quality for this species in the Preserve is moderate to good. No chaparral or coastal scrub occurs on the Preserve, but sedimentary soils within grasslands and hardwood forests and woodlands are relatively abundant. Available openings are also likely abundant (Note that the only data available indicating openings are roadsides, which underestimate the amount of best habitat available in Figure 37). Robust Monardella is impacted by pig rooting and non-native species. Habitat

quality has likely been reduced on the Preserve where there is an extensive wild pig population and grasslands are invaded by non-native plants population.

*Nearest Occurrence:*

Documented Occurrences in Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: Robust Monardella occurs to the north and south of the Preserve in the North Coast Ranges and in the San Francisco Bay Area. This species is known from 4 occurrences in Mendocino County (Calflora 2010). The nearest occurrence is approximately 16 miles southeast of the Preserve in Sonoma County in the Middle Russian River watershed (Calflora 2010).

*Summary:* The Robust Monardella is “Likely to Occur” because habitat is moderate to good, relatively abundant, and the Preserve occurs within the documented range of the species.

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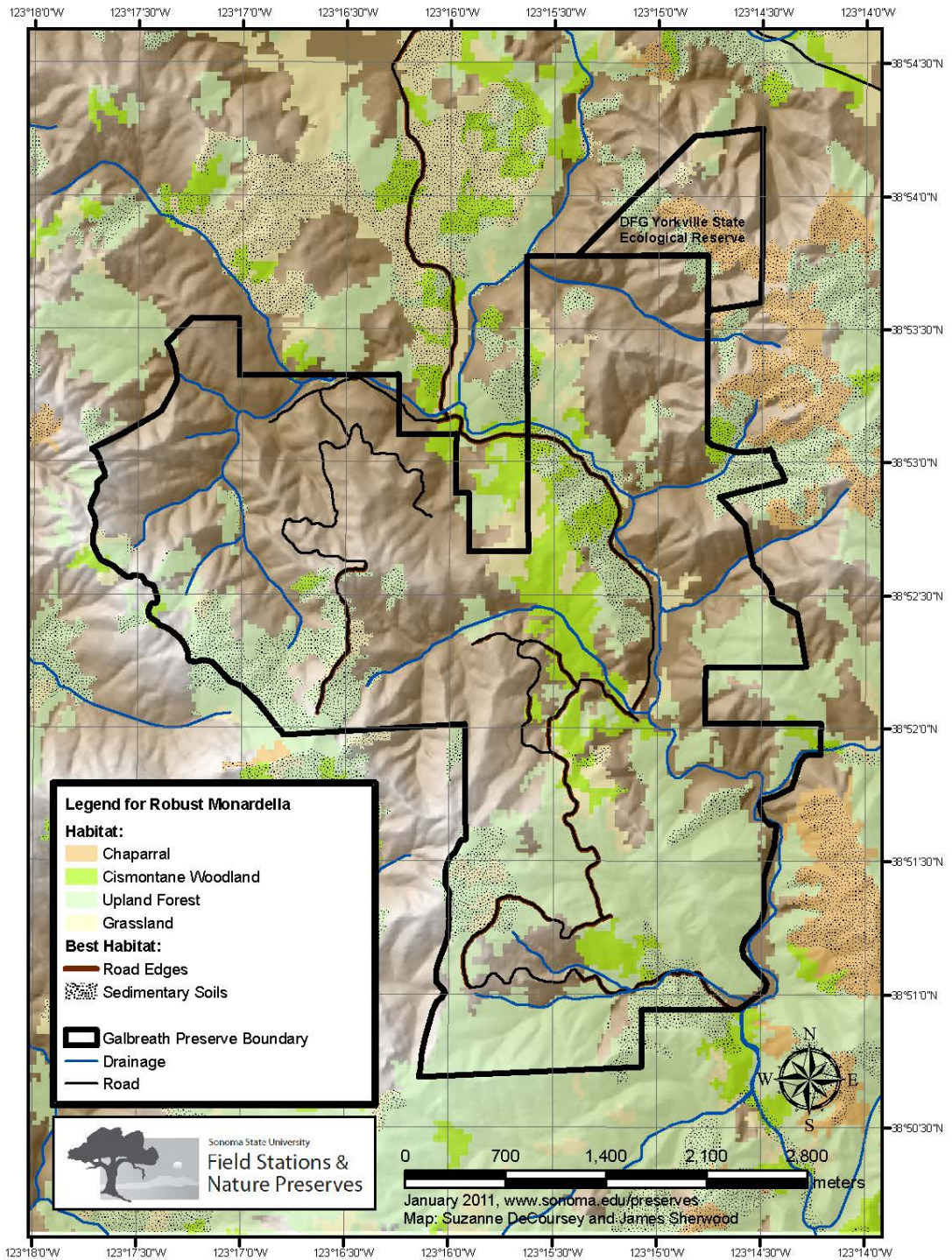
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**Species Account Description:** Linden Schneider

Figure 37. Potential habitat for Robust Monardella, *Monardella villosa* ssp. *globosa*



Magnoliopsida (Flowering Plants): Limnanthaceae  
**Baker's Meadowfoam (*Limnanthes bakeri*)**  
**Potential Occurrence: Unlikely to Occur**

**Status:**

Federal: None

State: Rare

CNPS: 1B.1

Other: none



**Species Description:** Baker's Meadowfoam grows up to 40 cm tall with once, odd-pinnate leaves (Hickman 1996). The inflorescence is solitary and peduncled (Hickman 1996). The flowers have 4 to 5 sepals and petals, which are funnel to bell shaped and pale yellow with white tips (Hickman 1996). The fruit is made of 1 to 5 obovoid, densely tubercled, short and wide nutlets (Hickman 1996).

**Nomenclature:** *Limnanthes bakeri* J.T. Howell Limnanthaceae (USDA 2010)

**Synonyms:** none

**Distribution:** This species occurs in the central outer North Coast Ranges in Mendocino County in Little Lake Valley, an area near Laytonville, Halls Valley and area near Ukiah at elevations ranging 175 to 910 m (Calflora 2010; Hickman 1996; NatureServe 2009).

**Life History & Threats:** Baker's Meadowfoam is an annual herb flowering from April to May and is threatened by development, altered hydrology, grazing and road construction (CNPS 2010).

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Vernal Pools and seeps (CNPS 2010)

**Vegetation Types:** Meadows that are dominated by more or less dense grasses, sedges, and herbs, freshwater marshes and swamps, valley and foothill grasslands that are vernal mesic and dominated by introduced annual Mediterranean grasses and native herbs (CNPS 2010).

**Topography and Microclimates:** Vernal pools (CNPS 2010)

**Elevation:** 175 to 910 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** Acidic clay loam (NatureServe 2009)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as grasslands.

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* The best habitat for this species in the Preserve is seasonally wet areas in grasslands. No marshes or swamps occur within the Study Area. The grasslands indicated in GIS map overestimate the extent of potential habitat for this species which potentially occurs only in wet areas within this vegetation type. Location of springs and seeps are not available in GIS datalayers, but based on field reconnaissance surveys are common on the Preserve. Habitat quality for this species is good to moderate. Baker's Meadowfoam is typically found in areas with dense grasses, sedges and herbs, and seeps on the Preserve typically are dominated by rushes (*Juncus spp.*), sedge (*Cyperus eragrostis*), mint (*Menthe pulegium*), and bracken ferns (*Pteridium aquilium*).

*Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: A previous site visit of the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010)

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is known only from 48 occurrences in Mendocino County (Calflora 2010). The nearest occurrence is reported from Lake County in the USGS Ukiah quad, the center of which is approximately 22 miles northeast of the Study Area in the Upper Russian River watershed (Calflora 2010). Nearest-neighbor distances among reported occurrences can be as much as 13 miles (estimated from Calflora 2010).

*Summary:* We anticipate that Baker's Meadowfoam is "Unlikely to Occur" in the Galbreath Wildlands Preserve. Habitat quality at the Preserve is moderate to good and relatively common in grassland areas. However, all other reported occurrences for this species are over 22 miles north of the Preserve, a distance larger than that typically found among documented occurrences.

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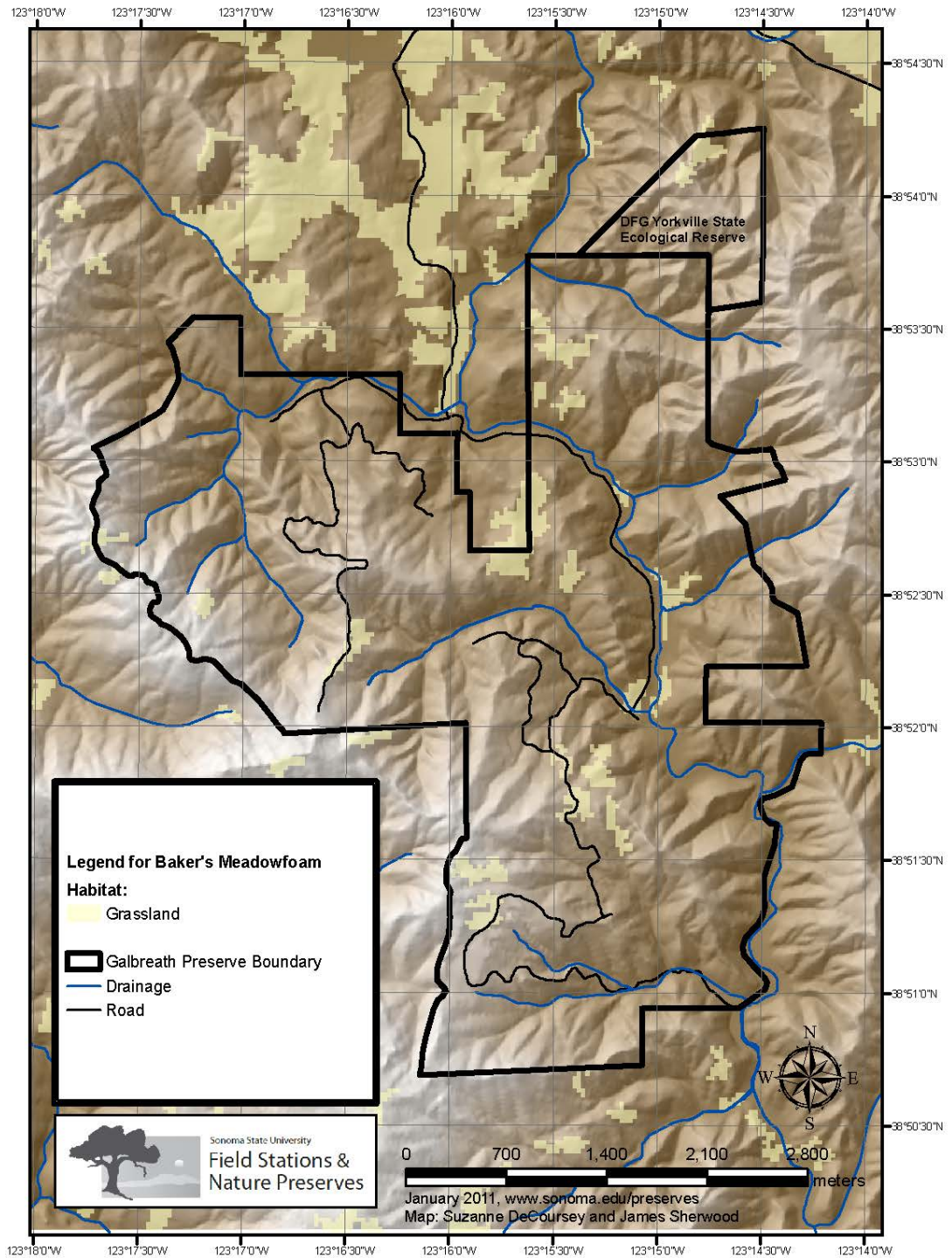
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**Species Account Description:** Linden Schneider & Emily Harvey

Figure 38. Potential habitat for Baker's Meadowfoam, *Limnanthes bakeri*



*Magnoliopsida (Flowering Plants): Linaceae*  
**Glandular Western Flax (*Hesperolinon adenophyllum*)**  
**Potential Occurrence: Not Expected to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** The

Glandular Western Flax is a shrub growing between 10 and 50 cm with leaf and bract margins having stalked, gland tipped teeth in rows of 1 to 3 (Hickman 1996). The inflorescence is a cyme with pedicles 5 to 15 mm and generally ascending to erect (Hickman 1996). The flowers have five sepals and five yellow petals that are veined or tinged orange and fade to white (Hickman 1996). The five anthers and three styles are yellow and the ovary has six chambers. The fruit is a smooth capsule (Hickman 1996).

**Nomenclature:** *Hesperolinon adenophyllum* (A. Gray) Small Linaceae (USDA 2010)

**Synonyms:** *Linum adenophyllum* Gray (IPNI 2005)

**Distribution:** This species occurs in north and central North Coast Ranges with the type locality being in Clear Lake in Lake County, but ranges throughout Lake and Mendocino counties between 150 and 1315 m (Hickman 1993; CNPS 2010; Small 1907).

**Life History & Threats:** Glandular Western Flax is an annual strict serpentine endemic blooming from May to August (CNPS 2010; Stafford et al 2005).

This annual is dependent on rainfall to appear in good numbers and can appear quite rare in drier years. Threats include road building and maintenance, development, grazing, logging, ORVs and trash. Geothermal development threatened one site at one time. (From NatureServe 2009)

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is fine gravelly serpentine flats in open foothill woodlands dominated by small to medium trees composed of one of more species of Oak (*Quercus sp.*) and evergreens, chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, and valley and foothill grasslands dominated by introduced, annual Mediterranean grasses and native herbs (CNPS 2010; Hickman 1993; Smith and Wheeler 1992)

**Topography and Microclimates:** open serpentine flats (Smith and Wheeler 1992), dry brushy hills, open hillsides (CNPS NCC 1997)

**Elevation:** 150 to 1,315 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).



*Geology and Soils:* restricted to serpentine rock (Smith and Wheeler 1992)

*Species Associations:* Foothill woodland, chaparral, and grassland species, which include but is not limited to Oaks (*Quercus sp.*), evergreen shrubs, Mediterranean grass and native herbs (CNPS 2010; Hickman 1993; Smith and Wheeler 1992).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- Cismontane woodland (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)
- Chaparral (i.e. Northern Mixed Chaparral and scrub oak)
- Grasslands

We additionally mapped possible best potential habitat in the areas identified above as:

- flats (slope 0 to 7 degrees)
- dry slopes (>8 deg slopes facing S, SE, or SW)
- serpentine soil parent material

Serpentine is not known to occur in the Study Area.

**Potential Occurrence on the Galbreath Wildlands Preserve:**

*Habitat:* Glandular Western Flax is restricted to serpentine soils in grasslands, chaparral or cismontane woodland. Despite the occurrence of appropriate vegetation types (figure 39), habitat for this species does not occur in the Preserve due to the lack of serpentine soils. To verify the lack of serpentine from GIS soil data layers, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.

*Nearest Occurrence:*

Documented Occurrences on the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: This species is known from 29 occurrences in Mendocino County (Calflora 2010). The nearest occurrence is approximately 17 miles east of the Preserve near the Mendocino and Lake County line in the Upper Russian River watershed (Calflora 2010). Occurrence of this species on the Preserve would be a southeastern range extension.

*Summary:* The Glandular Western Flax is “Not Expected to Occur” on the Preserve because there are no serpentine soils for this serpentine restricted species, and occurrence on the Preserve would constitute a southeast range extension of 17 miles.

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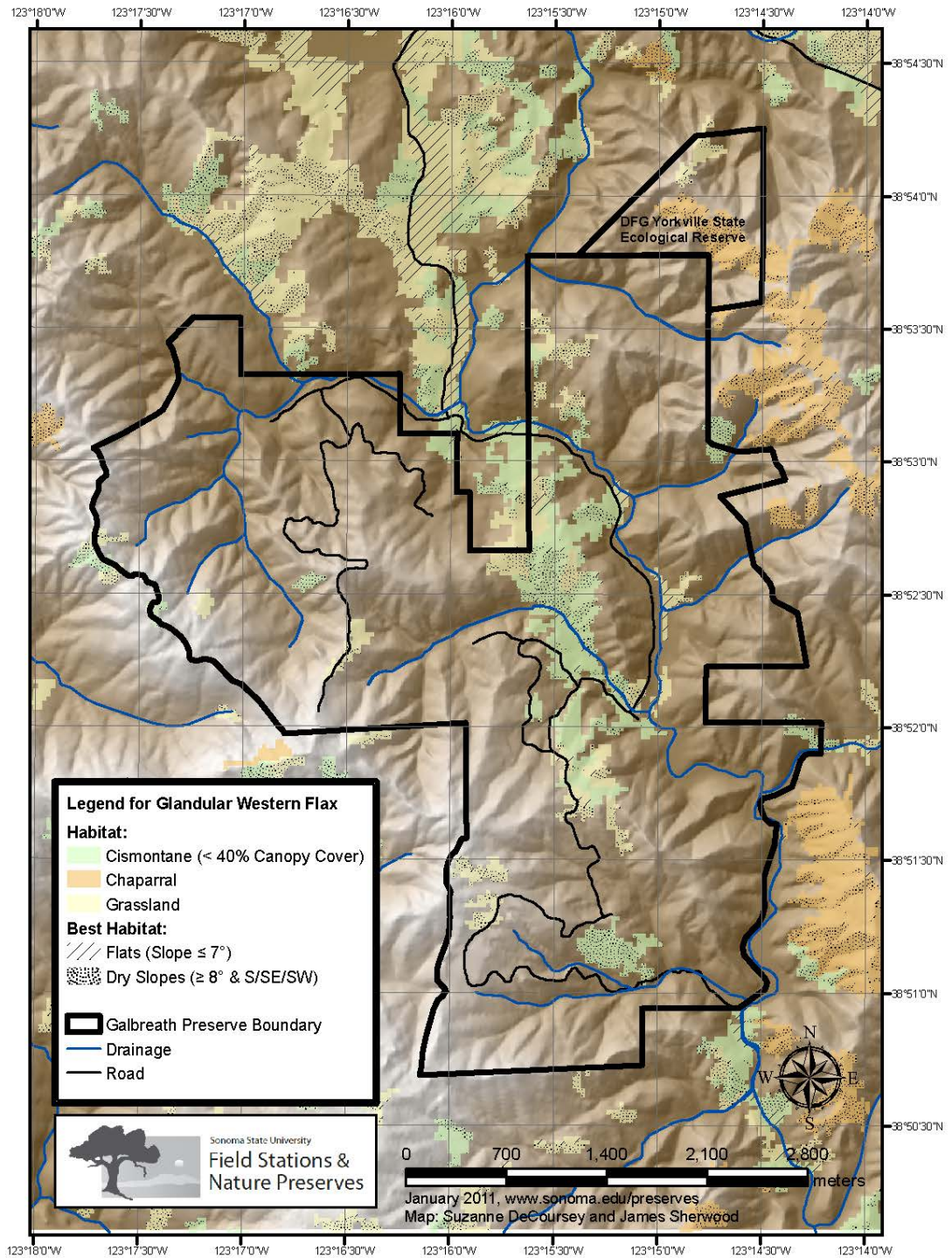
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**Species Account Description:** Linden Schneider

Figure 39. Potential habitat for Glandular Western Flax, *Hesperolinon adenophyllum*



*Magnoliopsida (Flowering Plants): Malvaceae*  
**Hall's Bush-mallow (*Malacothamnus hallii*)**  
**Potential Occurrence: Not Expected to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** Hall's Bush-mallow grows to 3 m with spreading stout branches and sessile, white, dense, shaggy hairs (Rosattii 2008). The leaves are wider than long, cordate and shallowly 3 to 7 lobed (Rosattii 2008). The inflorescence is a panicle like with 3 to 7 flowers per node and leaf like bracts (Rosattii 2008). The flower buds area rounded with calyx lobes awl shaped to lanceolate and petals pale pink to purplish white. The fruit segments are 3 to 5 mm, shallowly notched and brown (Rosattii 2008).

**Nomenclature:** *Malacothamnus hallii* (Eastw.) Kearney Malvaceae (Regents of the University of California 2010)

**Synonyms:** *Malacothamnus fasciculatus* (Torrey & A. Gray) E. Greene, *Malvastrum hallii* Eastw. (Regents of the University of California 2010)

**Distribution:** This species occurs throughout California in the North Coast Ranges, the Sierra Nevada Foothills, the central High Sierra Nevada, the San Joaquin Valley and the San Francisco Bay Area (Rosattii 2010). CNPS (2010) finds Mendocino County occurrence needs verification.

**Life History & Threats:** Hall's Bush-mallow is an evergreen shrub blooming from May to October and is threatened by development and non-native plants (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches (CNPS 2010).

**Topography and Microclimates:** open chaparral (Rosattii 2008)

**Elevation:** 10 to 760 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as chaparral (i.e. Northern Mixed chaparral or scrub oak).

**Potential Occurrence in the Galbreath Wildlands Preserve:**

**Habitat:** Habitat preferred by the Hall's Bush-mallow is limited to chaparral dominated by evergreen shrubs. Although scattered chaparral species (i.e., chamise) have been found in

isolated locations on south-facing slopes in the Preserve, the GIS map generally provides an accurate description of chaparral distribution as not occurring within the Galbreath Wildlands Preserve.

*Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: A previous site visit of the Galbreath Wildlands Preserve did not find this species (SSU Field Station and Nature Preserves 2010)

Nearest Occurrence to the Galbreath Wildlands Preserve: North of the Bay Area, Hall's Bush Mallow is known only from Mendocino County (4 occurrences) north of the Preserve and to the east in Lake County (1 occurrence). (Calflora 2010). The nearest occurrence to the Preserve is approximately 13 miles northeast of the Preserve in the Navarro River watershed (Calflora 2010).

*Summary:* We anticipate that this species is "Not Expected to Occur" in the Galbreath Wildlands Preserve due to the lack of potential habitat (chaparral).

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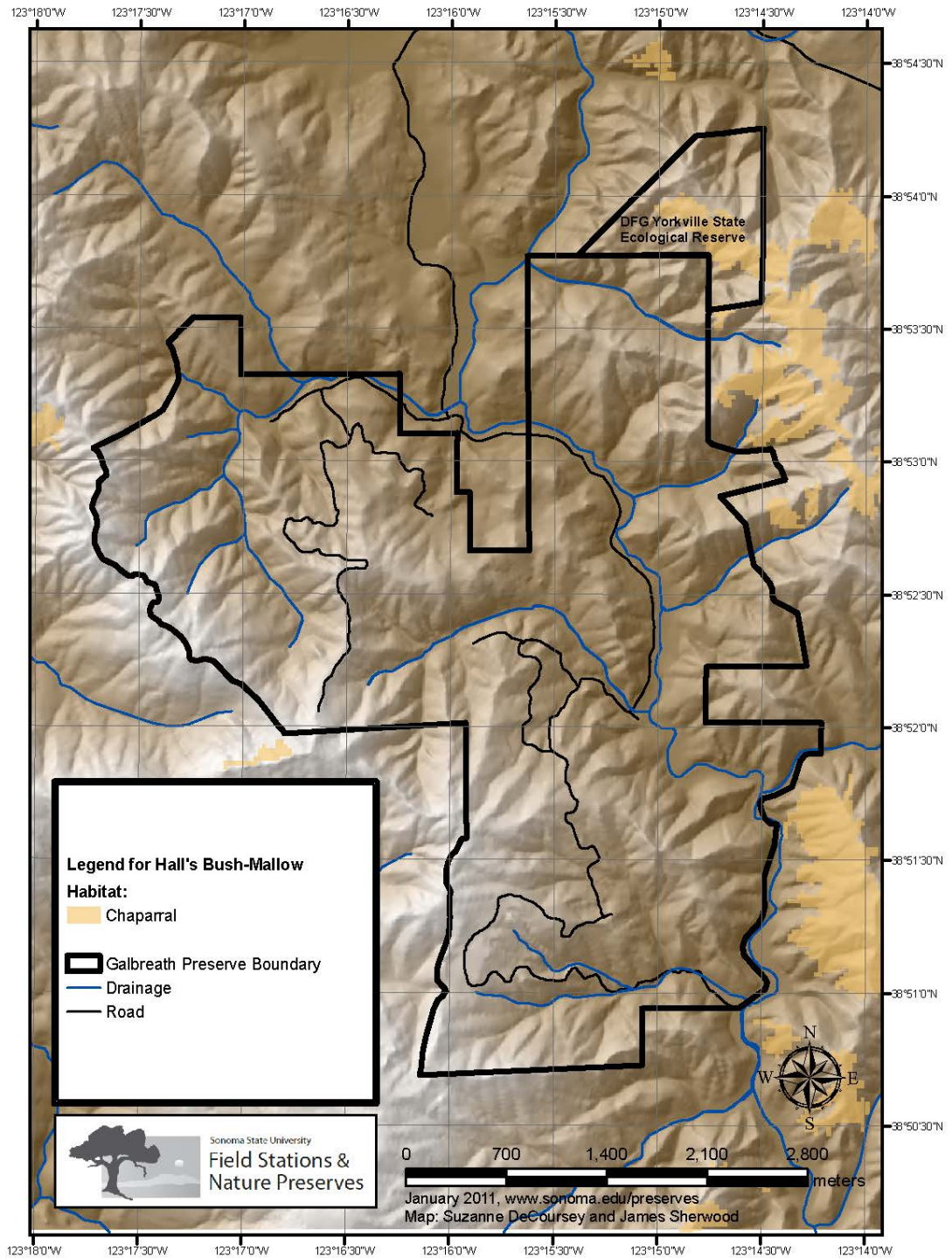
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**Species Account Description:** Linden Schneider & Emily Harvey

Figure 40. Potential habitat for Hall's Bush-Mallow, *Malacothamnus hallii*



*Magnoliopsida (Flowering Plants): Malvaceae*  
**Mendocino Bush-mallow (*Malacothamnus mendocinensis*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

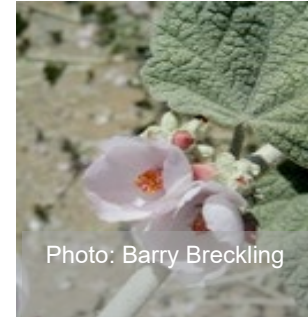
Federal: None

State: None

CNPS: 1A

Other: None

No photo available of *M. mendocinensis*. This photo is *M. fasciculatus* from Santa Clara County.



**Species Description:** The Mendocino Bush-mallow is woody and grows up to 2 m high with stout, striate-angular and very closely pubescent stems (Kearney 1951). The obovate to sub orbicular, minutely stellate-pubescent leaves are short petioled and up to 5 cm long with 3 to 5 deep and angular lobes that are shallowly crenate, rounded at the apex and cordate at the base (Kearney 1951). The inflorescence is elongate and narrowly paniculate with short pedicled flowers (Kearney 1951). The flowers have small bractlets, only  $\frac{1}{4}$  as long as the 5 to 6 mm, densely sublepidote calyx with extremely short, many-armed hairs (Kearney 1951). The petals are 10 to 12 mm and pale to pinkish purple or white (Hickman 1996; Kearney 1951). The fruit is disc like and not stalked and barely incised (Hickman 1996; Kearney 1951).

**Nomenclature:** *Malacothamnus mendocinensis* (Eastw.) Kearney Malvaceae (USDA 2010)

**Synonyms:** *Malacothamnus fasciculatus* (Nutt. ex Torr. & A. Gray) Greene, *Malvastrum mendocinense* Eastw., (Regents of the University of California 2010; IPNI 2005)

Taxonomy for this species is in flux. Type specimens of *M. mendocinensis* have been annotated as *M. fasciculatus* ssp. *fasciculatus* indicating that this species may actually be a subspecies of the much more widespread and highly variable *M. fasciculatus* (Eastwood and Howell 1938). However, this annotation has not been addressed in the literature and on-line databases where *M. mendocinensis* is treated as a separate species. However, the Jepson Online Interchange California Floristics treats *M. fasciculatus* as the current name for *M. mendocinensis*, which is therefore considered a nomenclatural synonym. Neither *M. fasciculatus* nor the basionym subspecies are listed species (Regents of the University of California 2010). For this description, we restrict our summary to information attributed to "*M. mendocinensis*."

**Distribution:** This species is found only in Mendocino County about 5 miles southwest of Ukiah (Kearney 1951).

**Life History & Threats:** The Mendocino Bush-mallow is a perennial shrub blooming from May to June (CNPS 2010). This species is believed to be extinct and is known from only two historical collections from 1939 (CNPS 2010).

### **Habitat & Habitat Associations:**

*Vegetation Types:* Habitat for this species is cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

*Topography and Microclimates:* Steep rocky cliff (Smith and Wheeler 1992). On bank along roadside (Eastwood 1939).

*Elevation:* 425 to 575 m (CNPS 2010). (The Study Area ranges from 230 to 710 m)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- above 395 m and below 605 m elevation (a 30 m elevation buffer was added around known elevational occurrences of this species)
- cismontane woodland (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover 10 to 40%)

We mapped best potential habitat as areas in the above areas with:

- Steep slopes (>18 degrees)
- Roadsides

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Mendocino Bush Mallow occurs on steep rocky cliffs in cismontane woodland. Habitat quality is moderate to good. Cismontane woodland within the appropriate elevational range is highly restricted, but does occur on the steep slopes preferred by this species. Field reconnaissance also indicates that rocky outcrops are abundant within all habitat types of the Preserve and suggest that rocky soils may occur within these areas. The largest patch of potential habitat is located in the southern center of the Preserve and also includes an area of roadside.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is documented from only 6 occurrences, all with Mendocino County, and is believed to be extinct (Calflora 2010). The nearest occurrence was approximately 13 miles north of the Study Area in the Navarro River watershed (Calflora 2010). Occurrence of this species at the Galbreath Wildlands Preserve would constitute a southern extension.

*Summary:* The Mendocino Bush-mallow is “Unlikely to Occur” in the Preserve because habitat quantity is limited, occurrence at the Preserve would constitute a 13 mile southern range extension, and the last recorded occurrence of this species was in 1939.

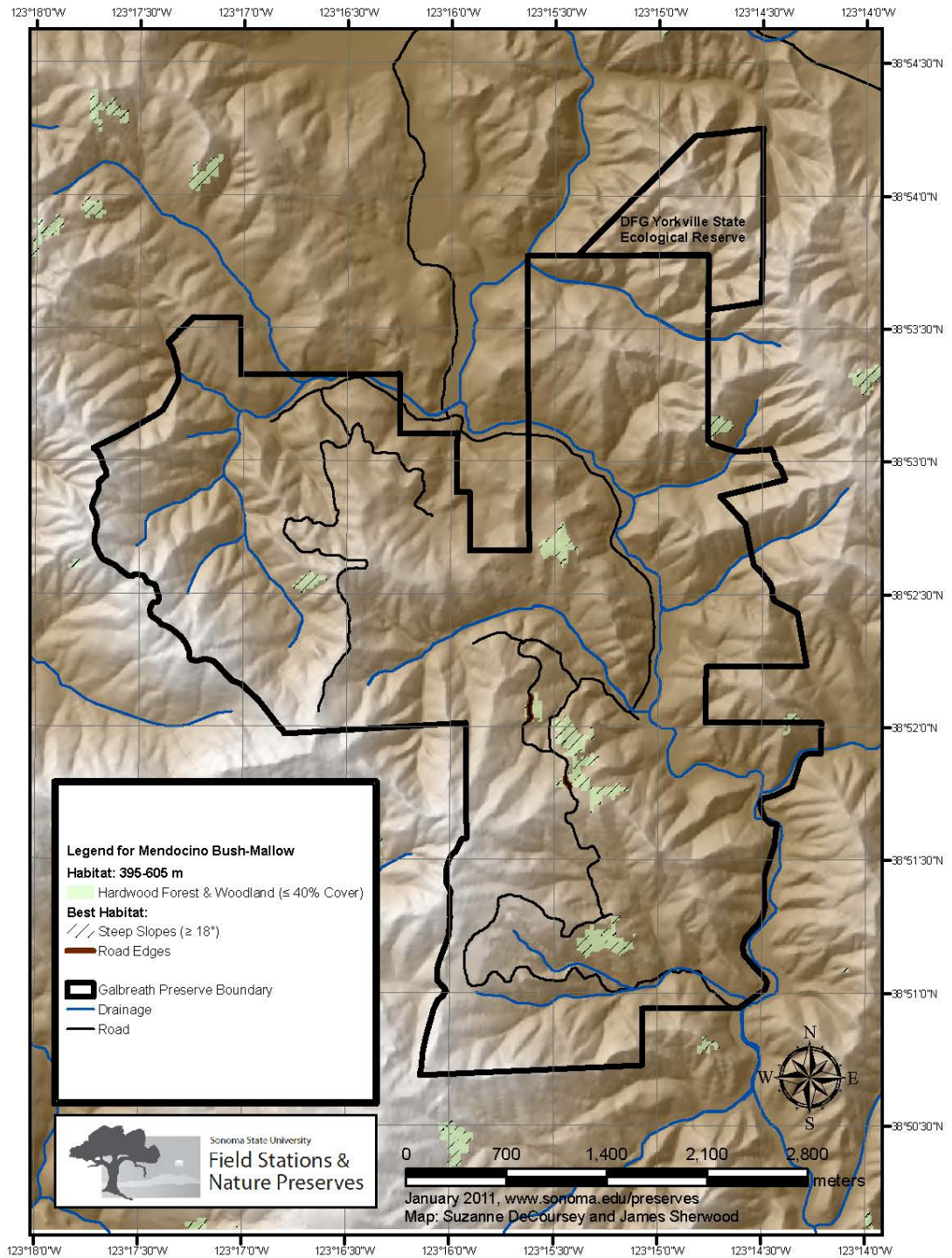


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**Species Account Description:** Linden Schneider

Figure 41. Potential habitat for Mendocino Bush-Mallow, *Malacothamnus mendocinensis*



*Magnoliopsida (Flowering Plants): Onagraceae*  
**Oregon Fireweed (*Epilobium oreganum*)**  
**Potential Occurrence: Not Expected to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:**

The Oregon Fireweed is an herb growing 40 cm to 1 m tall from leafy basal shoots with a glabrous and glaucous stem and narrowly lanceolate to narrowly ovate leaves with reddish veins (Hickman 1996). The inflorescence is a sparsely strigose raceme with pink to rose-purple flowers with a four lobed stigma (Hickman 1996). The fruit is a 25 to 45 mm hairy, glandular capsule with papillate ridged seeds (Hickman 1996).

**Nomenclature:** *Epilobium oreganum* Greene Onagraceae (USDA 2010)

**Synonyms:** *E. exaltatum*, *E. glaucum*, *E. subcaesium* (Calflora 2010; IPNI 2005)

**Distribution:** This species occurs in southwest Oregon and California where it is found in the Klamath Ranges and the outer North Coast Ranges (Hickman 1996).

Historically, it was known from...seven other California Counties, as far south as Mendocino County. Its current California distribution needs further study. (From Kagan et al. 2006)

**Life History & Threats:** The Oregon Fireweed is a perennial herb blooming from June to September and is threatened by logging, drainage, off road vehicle use, mining, wetland alteration, fire suppression, and grazing (CNPS 2010; NatureServe 2009; Kagan et al. 2006).

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Habitat for this species is bogs and fens dominated by perennial herbs and low shrubs (CNPS 2010). Occurs almost always under natural conditions in wetlands (Calflora 2010). Open, wet, boggy, serpentine sites and wet gently sloping stream banks, meadows (NatureServe 2009).

**Vegetation Types:** Habitat for this species is mesic lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory and upper montane coniferous forests with the same dominant trees (CNPS 2010).

**Topography and Microclimates:** Small streams and ditches (Hickman 1996). River terrace fens (Kagan et al. 2006).

*Epilobium oreganum*, can tolerate some cover, and therefore may be less affected by encroaching vegetation than some other rare low growing forbs of Darlingtonia wetlands (Kagan et al. 2006). (From NatureServe 2009).

*Elevation:* 500 to 2240 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).

*Geology and Soils:* ultramafic or serpentine (USFWS 2006). Strong indicator and broad endemic to serpentine soil; 75 to 84% of occurrences are on ultramafics (Calflora 2010).

*Species Associations:* The Oregon Fireweed associates with the California Pitcher Plant (*Darlingtonia californica*) (NatureServe 2009).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- above 470 m (includes 30 m buffer on known elevational occurrences)
- grasslands
- coniferous forests (i.e. Redwood-Douglas or Pacific Douglas Fir vegetation) with a multi-storied canopy

Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area. Springs and seeps are common throughout the Study Area but are not available in the GIS database

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Oregon Fireweed occurs in wet to mesic ultramafic or serpentine soils in grasslands and coniferous forests. Potential habitat for this species does not occur the Galbreath Wildlands Preserve:

- Ultramafic or serpentine soils do not occur in the Preserve. Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Galbreath Wildlands Preserve. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.
- Appropriate vegetation type (multi-storied coniferous forest) within the known elevational range of the species is very limited.
- The species is impacted by logging. The Preserve has a history of logging. Timber harvest plans indicate that both clear cut and selection cut methods were used to harvest Redwood, Douglas Fir, and hardwoods at least between 1988 and 2000.

#### **Nearest Occurrence:**

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Mendocino County is the southern edge of this species range along the North Coast. This species is known from 5 occurrences in the County (Calflora 2010). The nearest occurrence is approximately 13 miles northeast of the Galbreath Wildlands Preserve in the Upper

Russian River watershed (Calflora 2010). Occurrence of this species on the Preserve would constitute the southernmost occurrence of this species on the North Coast (Calflora 2010).

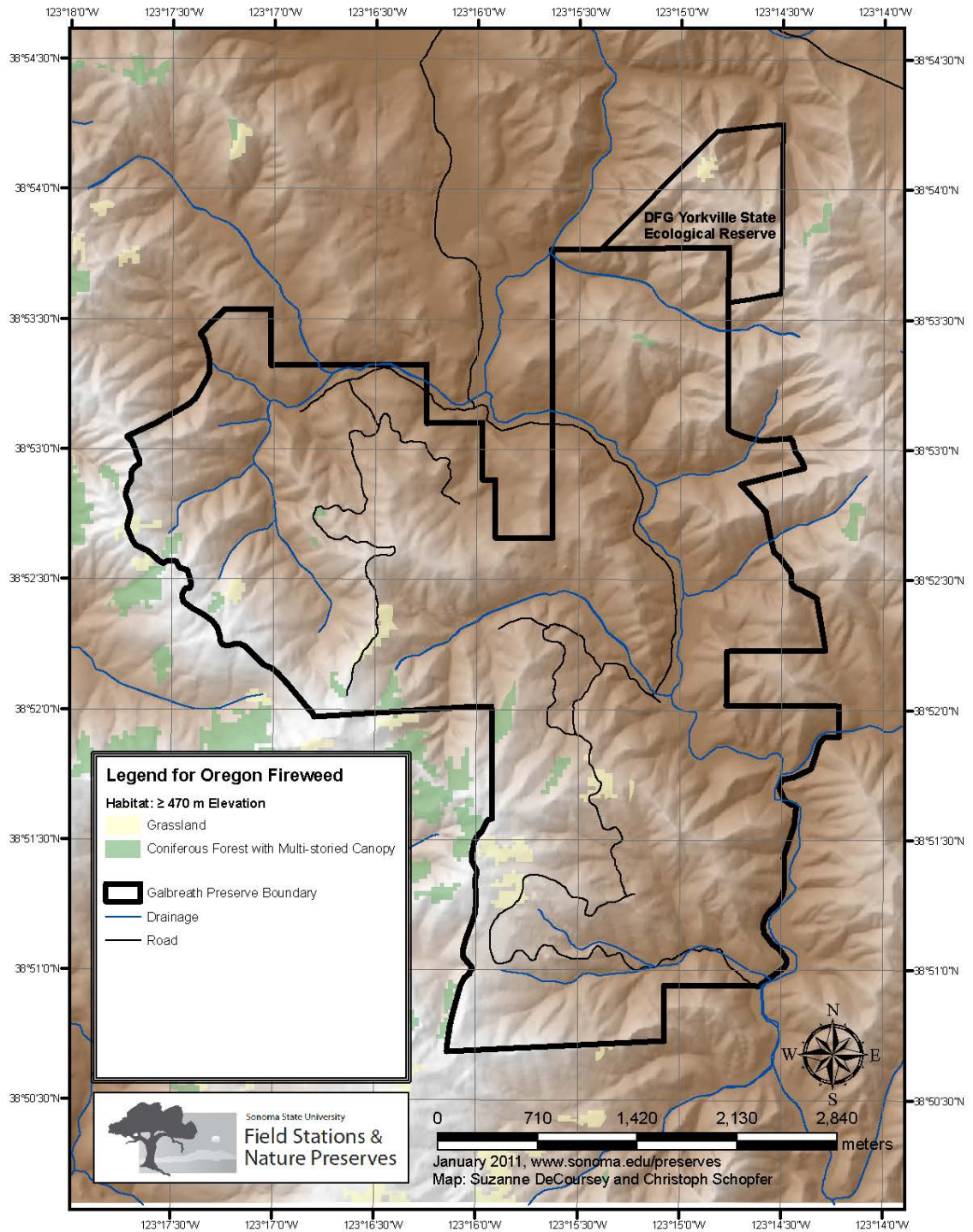
*Summary:* We anticipate the Oregon Fireweed to be “Not Likely to Occur” because potential habitat does not occur within Preserve boundaries.

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**Species Account Description:** Linden Schneider

Figure 42: Potential habitat for Oregon Fireweed (*Epilobium oreganum*)



*Magnoliopsida (Flowering Plants): Orobanchaceae*  
**Small Groundcone (*Boschniakia hookeri*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: none

State: none

CNPS: 2.3

Other: S1S2 G5



**Species Description:** The Small Groundcone is a parasitic plant that lacks green tissues and has roots that are modified into absorptive structures (Hickman 1996). The above-ground portion of the plant is 7 to 12 cm tall and the inflorescence is 3 to 6 cm less than 3 cm in diameter (Hickman 1996). It ranges in color from pale yellow to reddish-purple and can be mistaken for a pine cone lying on the ground (Hickman 1996).

**Nomenclature:** *Boschniakia hookeri* Walp. Orobanchaceae (USDA 2010)

**Synonyms:** *Kopsiopsis hookeri* (Walp.) Govaerts (Rosatti 2008)

**Distribution:** The Small Groundcone's distribution ranges from British Columbia south to Mt. Tamalpais in Marin County (Hickman 1996). In California, it is known from 36 locations in Del Norte, Humboldt, Lake, Mendocino, Marin and Trinity counties (Calflora 2010).

**Life History & Threats:** This species flowers from June to July and is possibly threatened by logging (CNPS 2010)

**Habitat & Habitat Associations:**

**Vegetation Types:** Coniferous forest, Redwood-Douglas fir mix and Pacific Douglas fir (Hickman 1996; CNPS 2010). North Coast coniferous forest. Found in shrubby places and open woods (Hickman 1996).

**Elevation:** Below 300 meters (Hickman 1996). There are Consortium records that, if verified, would voucher elevations up to 762 m (Rosatti 2008).

**Species Associations:** It is found parasitizing the Ericaceous shrubs including salal (*Gaultheria shallon*), kinnikinnick (*Arctostaphylos uva-ursi*), and evergreen huckleberry (*Vaccinium ovatum*) (Rosatti 2008; CNPS 2010).

**Conceptual Basis for GIS Model Development:** Potential habitat for this species was mapped as:

- open (< 40% canopy cover) coniferous forest types (Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*)).

## Potential Occurrence in the Galbreath Wildlands Preserve:

*Habitat:* Small Groundcone occurs in shrubby or open coniferous forest. Habitat quality is moderate to good for this species. While areas of coniferous forest with open canopy (< 40% canopy cover) are limited (Figure 43), open or shrubby areas may exist in many areas where there are openings in the forest. Huckleberry (*Vaccinium ovatum*), a known host of Small Groundcone, occurs in the Preserve (SSU Field Stations and Nature Preserves 2010) occurs in areas of coniferous forest where clearings have been made to accommodate log piles during historic logging practices (C. Luke pers. comm.).

### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species, but did document one of the Small Groundcone's host species, *Vaccinium ovatum*. (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: The Small Groundcone is distributed throughout the North Coast of California, and as far south as Marin County. The nearest location is in Hopland, Mendocino County, approximately 14 miles from the Galbreath Wildlands Preserve in the Upper Russian River Watershed (Calflora 2010).

*Summary:* We anticipate the Small Groundcone to be "Likely to Occur" because habitat quality is moderate to good and the Preserve is within the range of this species.

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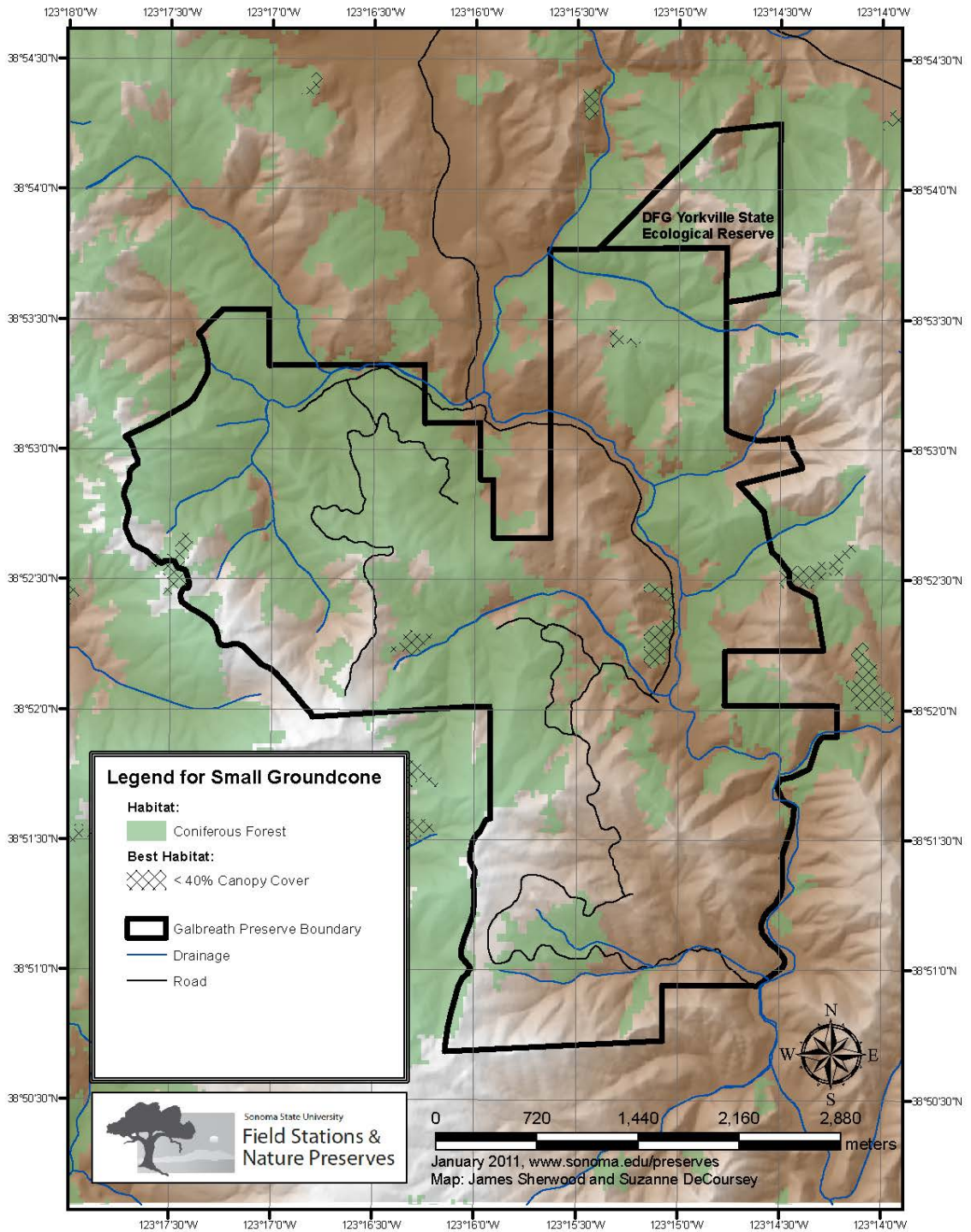
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**Species Account Description:** Kandis Gilmore & Linden Schneider

Figure 43: Potential habitat for Small Groundcone (*Boschniakia hookeri*)



Magnoliopsida (Flowering Plants): Polemoniaceae  
**Jepson's Leptosiphon (*Leptosiphon jepsonii*)**  
**Potential Occurrence: Unlikely to Occur**

**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:**

Jepson's Leptosiphon is hairy, standing 4 to 12 cm high with cauline, opposite leaves with narrow-obovate to linear, palmate lobes (Rosattii 2008). The inflorescence occurs in heads with leaf like bracts (Rosattii 2008). The flower has a ciliate non-glandular calyx with an obscure membrane (Rosattii 2008). The corolla is salverform and pink or white with a yellow throat and elliptic to ovate lobes with the stamens exerted (Rosattii 2008).

**Nomenclature:** *Leptosiphon jepsonii* (D.W. Schemske & C. Goodwillie) J.M. Porter & L.A. Johnson Polemoniaceae (USDA 2010). This species was described in 1996 and does not appear in The Jepson Manual (CNPS 2010).

**Synonyms:** *Linanthus jepsonii* Schemske & Goodwillie (Regents of the University of California 2010)

**Distribution:** This species is found in the southern North Coast Ranges (Rosattii 2008).

**Life History & Threats:** Jepson's Leptosiphon is an annual herb blooming from March to May (CNPS 2010). Threats to this species include habitat conversion and non-native plants (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010)

**Topography and Microclimates:** Open or partially shaded grassy slopes (Rosattii 2008).

**Elevation:** 100 to 500 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** primarily on volcanic soils (NatureServe 2009).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 530 m elevation (includes 30 m buffer around known elevational occurrences)

- chaparral (i.e. Northern Mixed Chaparral or scrub oak)
- cismontane woodlands (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover <40%)

We additionally mapped possible best potential habitat in the areas identified above as:

- Slopes (>8 deg)

Volcanic soils do not occur in the Study Area.

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Jepson's Leptosiphon occurs on volcanic soils (primarily) in grassy slopes in chaparral and cismontane woodland. Habitat quality is poor. Despite the occurrence of appropriate slope and vegetation types, volcanic soils are lacking in the Preserve.

### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is known from five counties in the southern North Coast Range, but has not been documented in Mendocino County. The 22 occurrences in Sonoma County (Calflora 2010) lie predominantly in inland areas. The nearest occurrence is approximately 13 miles southeast of the Preserve in the Cloverdale quad in the Middle Russian River watershed (Calflora 2010).

*Summary:* Jepson's Leptosiphon is "Unlikely to Occur" because habitat quality is poor and an occurrence at the Preserve would constitute a western range extension for this species from warm dry inland areas into the cool wet Outer North Coast Range.

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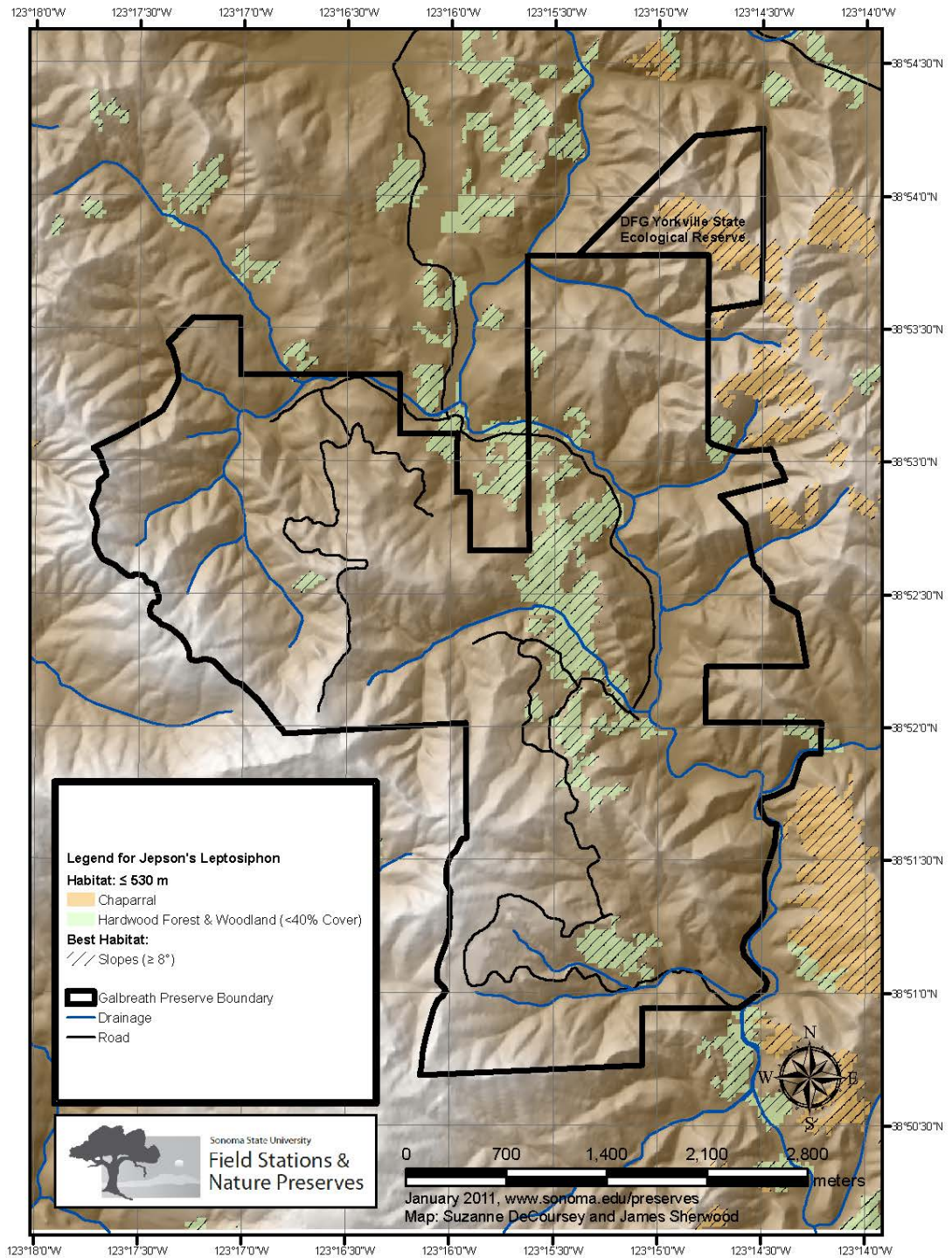
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**Species Account Description:** Linden Schneider

Figure 44. Potential habitat for Jepson's Leptosiphon, *Leptosiphon jepsonii*



Magnoliopsida (Flowering Plants): Polemoniaceae  
**Baker's Navarretia (*Navarretia leucocephala* ssp. *bakeri*)**  
**Potential Occurrence: Likely to Occur**

**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: None



**Species Description:** Baker's Navarretia is puberulent or recurved hairy and 2 to 10 cm high with branches ascending and leaves once to twice pinnate, the lower ones being glabrous and the upper ones being hairy at base (Hickman 1996). The inflorescence is a head with outer bracts leaf like and lobes needle like (Hickman 1996). The calyx is 4 to 5 lobed with a ciliate membrane between and slightly hairy ribs (Hickman 1996). The corolla is white to blue, with tube included, lobes and style exerted, and 2 stigmas (Hickman 1996). The fruit is a translucent ovoid capsule with 1 to 3 chambers adhering to the 2 to 4 seeds until wet at which point they separate (Hickman 1996).

**Nomenclature:** *Navarretia leucocephala* Benth. ssp. *bakeri* (H. Mason) Day Polemoniaceae (USDA 2010)

**Synonyms:** *N. bakeri* (Regents of the University of California 2010)

**Distribution:** This species is found in the inner North Coast Range and the west Sacramento Valley between 5 and 1730 m, but may be more widespread (CNPS 2010; Hickman 2010). This species has also been documented in the outer North Coast Ranges (CalFlora 2010).

**Life History & Threats:** Baker's Navarretia is an annual herb flowering from April to July and is threatened by development, habitat alteration, road construction and agriculture (CNPS 2010).

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Vernal pools and seeps (CNPS 2010)

**Vegetation Types:** Meadows that are dominated by more or less dense grasses, valley and foothill grasslands dominated by introduced annual Mediterranean grasses and native herbs, lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory, and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:**

Occurs almost always under natural conditions in wetlands [U.S. Fish & Wildlife Service.] (From Calflora 2010)

*Elevation:* 5 to 1,730 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

*Geology and Soils:* clay or alkaline soils (City of Vacaville 2010)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- Grasslands
- Coniferous forests (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*) vegetation types) with a multi-storied canopy
- Cismontane woodlands (i.e., mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)

We additionally mapped possible best potential habitat in the areas identified above as:

- Moist areas (poor drainage poor and high available water capacity)

For mapping purposes, this was interpreted to mean areas where either drainage is poor or available water capacity is high. As such, separate data layers were created for each of these conditions.

- Clay loam soils

Spring and seep locations are not available in GIS data layers.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Baker's Navarretia occur in wetlands (vernal pools and seeps) in grasslands, woodlands and forests. Habitat quality in the Preserve is moderate to good. Field reconnaissance indicates that seeps and springs are abundant in all habitat types on the Preserve, and Baker's Navarretia is known to occur area where non-native grasses and herbs are also present. Best habitat for this species may be in the clay loam soils that support grasslands and cismontane woodlands in the central section of the Preserve.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species, but an unidentified Navarretia (*Navarretia* sp.) was noted (SSU Field Stations and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: This species is widespread in the Inner North Coast Ranges but has also been documented from the Outer Ranges. It is known from 15 occurrences in Mendocino County (Calflora 2010) which tend to lie inland and north of the Preserve along the Hwy 101 corridor. The nearest occurrence is approximately 30 miles to the northeast of the Study Area in Redwood Valley in the Upper Russian River watershed (Calflora 2010).



*Summary:* Baker's Navarretia is "Likely to Occur" at the Preserve because habitat quality is moderate to good and this species is documented from areas north and south of the Preserve. Note however, that occurrences of this species in the Outer North Coast range are not common and climate at the Preserve may be too cold or wet to support Baker's Navarretia.

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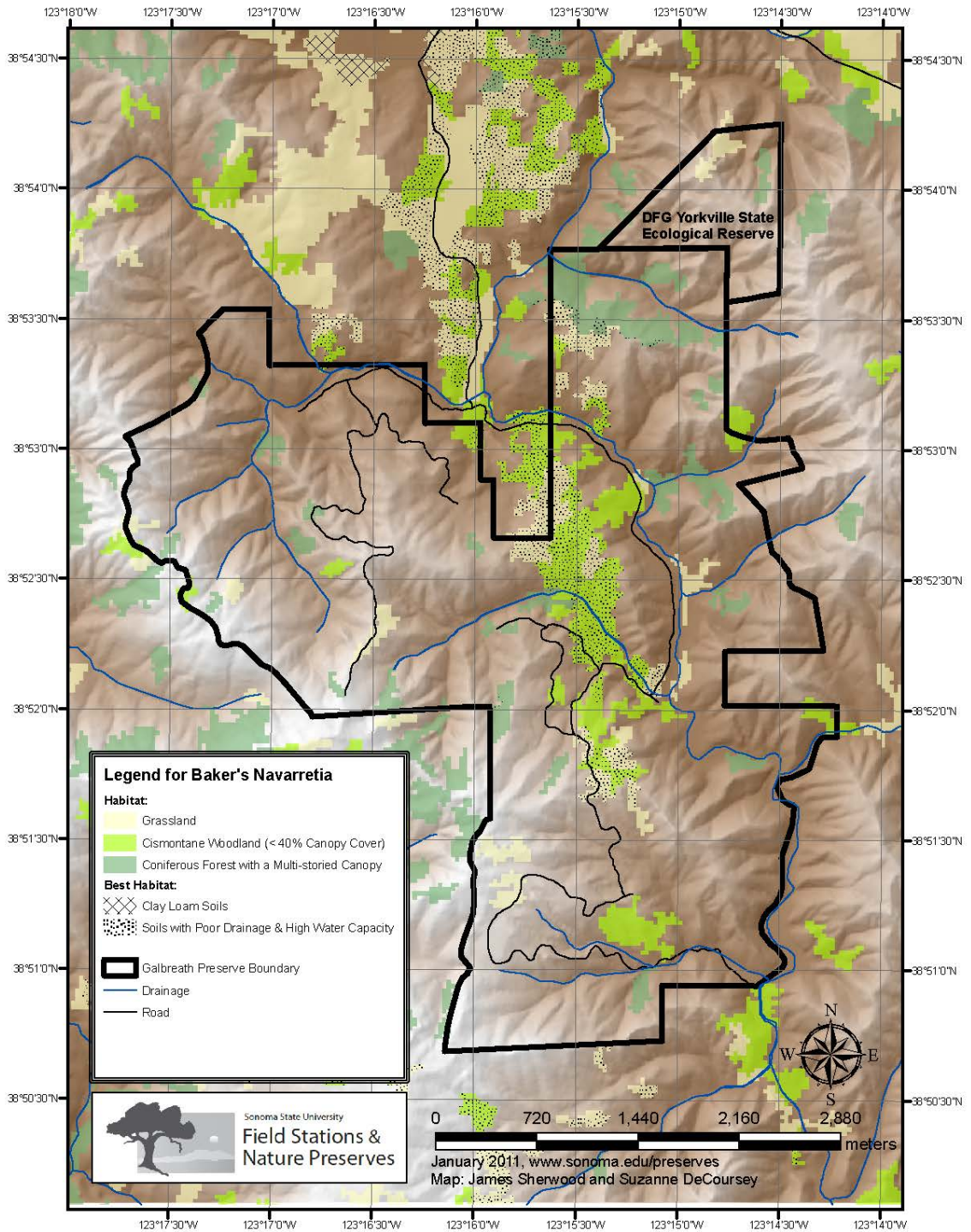
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**Species Account Description:** Linden Schneider

Figure 45: Potential habitat for Baker's Navarretia (*Navarretia leucocephala bakeri*)



Magnoliopsida (Flowering Plants): Polemoniaceae  
**Oregon Polemonium (*Polemonium carneum*)**  
**Potential Occurrence: Unlikely to Occur**

**Status:**

Federal: None

State: None

CNPS: 2.2

Other: None



**Species**

**Description:** The Oregon Polemonium is minutely hairy with 1 to 3 decumbent to erect 50 cm to 1 m tall stems and pinnately compound cauline leaves with 7 to 12, lanceolate to ovate leaflets (Hickman 1996). The inflorescence is a cluster like, open umbel of 3 to 7 flowers on 2 to 12 mm pedicels (Hickman 1996). The flowers have a 10 to 15 mm, rotate to bell shaped corolla that is flesh pink to purple, a 8 to 20 mm calyx and a style which is much bigger than the stamens (Hickman 1996). The fruit is a 6 to 8 mm capsule with 3 to 10 seeds per chamber (Hickman 1996).

**Nomenclature:** *Polemonium carneum* A. Gray Polemoniaceae (USDA 2010)

**Synonyms:** *Polemonium carneum* A. Gray ssp. *luteum* (A. Gray) Brand (USDA 2010)

**Distribution:** This species occurs in the Northwestern California, the central Coast, the San Francisco Bay Area and north to Washington (Hickman 1996)

**Life History & Threats:** The Oregon Polemonium is a perennial herb growing from a woody rhizome and blooming from April to September (CNPS 2010; Burke Museum of Natural History 2010). This species is threatened by logging (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is coastal prairie, coastal scrub and lower montane coniferous forests dominated by open to dense stands of conifers and broadleaved trees in the understory (CNPS 2010).

**Topography and Microclimates:** Moist to dry open areas (Hickman 1996) Thickets, woodlands and forest openings (Burke Museum of Natural History 2010). Moist thickets, forest edges and meadows (WNPS 2010)

Given absence of frequent summer water (distance from water-loving plants) and full or part shade (morning and winter sun may be tolerated), grows especially well in zones 6, 15, and 16 and also in zones 5 and 17. (Jepson Horticultural Database 2006)

**Elevation:** 0 to 1,830 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as area:

- coniferous forest (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*) vegetation types) with a multi-storied canopy.

Possible best potential habitat was mapped as roads in the above vegetation type.

Note that road margins are the only GIS data layer with relevance to “openings” in the Study Area, and other types of forest and chaparral openings could not be mapped. Coastal scrub and prairie do not occur in the Study Area.

### **Potential Occurrence in the Study Area:**

*Habitat:* Oregon Polemonium occurs in openings in multi-story coniferous forest. Habitat quality in the Preserve is moderate to good. Multi-storied coniferous forests preferred by this species are found within Preserve boundaries and canopy openings. Canopy openings have not been surveyed, but are likely present. Road margins are the only GIS datalayer with relevance to “opening” and underestimate the abundance of openings. The history of logging on Preserve lands may have enhanced or negatively impacted Oregon Polemonium habitat. This species is known to be negatively impacted by logging operations; alternatively logging practices may have created canopy openings preferred by this species.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Oregon Polemonium occurs predominantly in coastal counties of California, from San Mateo County northward. In these counties, it tends to “hug the coastline” and has not been documented from sites as far inland as the Galbreath Preserve (Calflora 2010). It is known from only 6 occurrences in Sonoma County and 1 in Mendocino (Calflora 2010). The nearest occurrence is approximately 40 miles southwest of the Galbreath Wildlands Preserve in Sonoma County in the Bodega Harbor watershed (Calflora 2010). Occurrence of this species on the Preserve would be an eastern range extension from documented occurrence records in coastal counties (but see Siskiyou County)(Calflora 2010).

*Summary:* We anticipate the Oregon Polemonium to be “Unlikely to Occur” because although habitat quality is moderate to good, occurrence at the Preserve would constitute the most inland location for the coastal counties in which it occurs.

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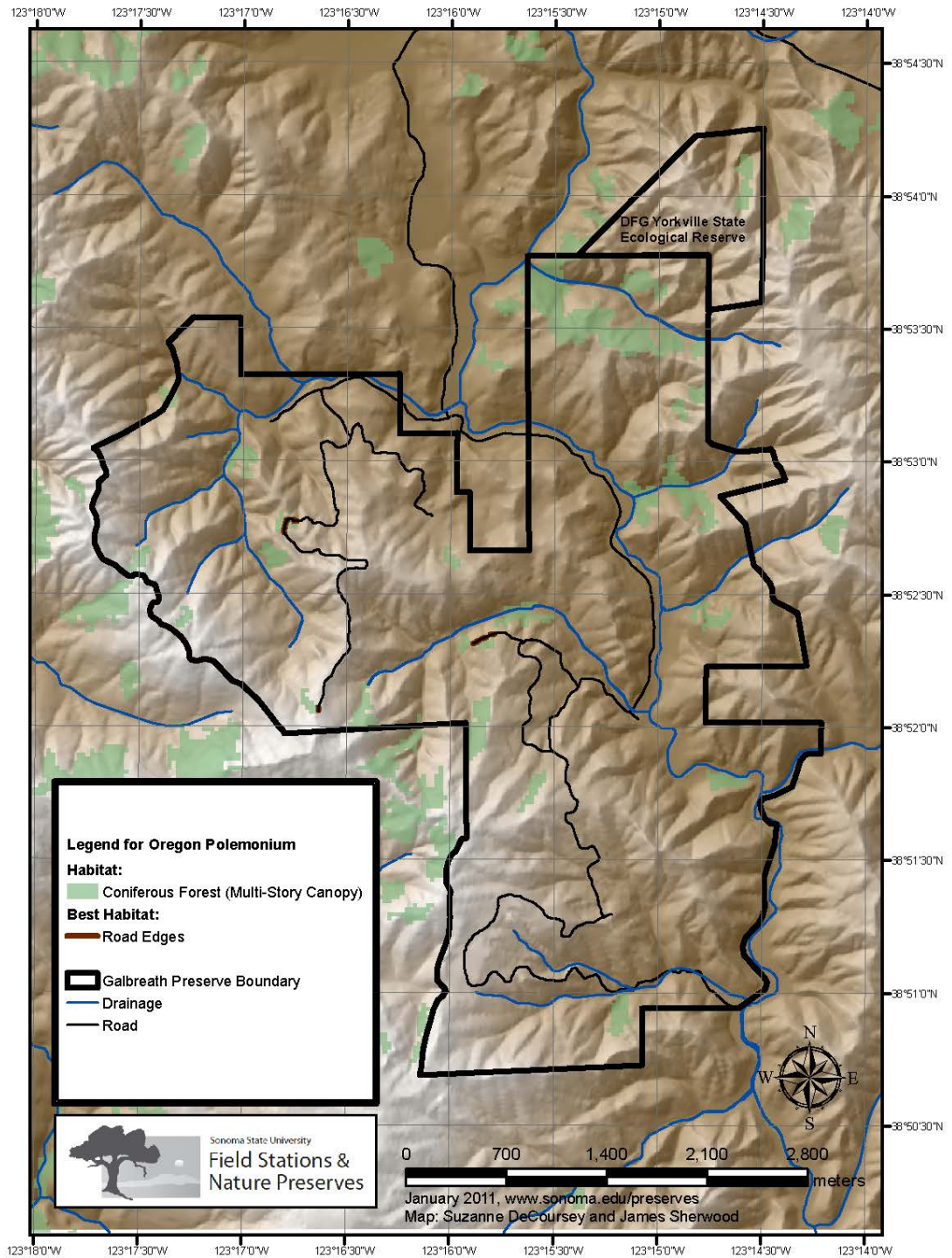
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**Species Account Description:** Linden Schneider

Figure 46. Potential habitat for Oregon Polemonium, *Polemonium carneum*



*Magnoliopsida (Flowering Plants): Polygonaceae*  
**The Cedars Buckwheat (*Eriogonum cedrorum*)**  
**Potential Occurrence: Not Expected to Occur**

**Status:**

Federal: None

State: None

CNPS: 1B.3

Other: None



**Species Description:** The Cedars Buckwheat is low and spreading, growing to be 10 to 50 cm across with loosely arranged rosettes of tufted leaves on slender, woody, branched stems growing from a stout taproot (Reveal and Raiche 2009). The leaves are broadly elliptic to ovate, thinly tomentose to glabrate or glabrous and greenish to light olive green with a 0.3 to 1.1 cm, densely tannish-white tomentose petiole (Reveal and Raiche 2009). The inflorescence is compound umbellate, slightly open with villous, grayish to greenish white branches and 4 to 6 bracts at the base (Reveal and Raiche 2009). The flowers are bright yellow becoming red to reddish maroon with an undertone of yellow and glabrous have obovate tepals (Reveal and Raiche 2009). The achenes are light yellowish brown and glabrous (Reveal and Raiche 2009).

**Nomenclature:** *Eriogonum cedrorum* Reveal & Raiche Polygonaceae (Reveal and Raiche 2009). This species was described in 2009 (CNPS 2010).

**Synonyms:** None

**Distribution:** This species is known from fewer than 5 occurrences in Sonoma County at The Cedars (CNPS 2010; Reveal and Raiche 2009)

**Life History & Threats:** The Cedars Buckwheat is a perennial herb flowering from June to September (CNPS 2010).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for this species is on serpentinite in coniferous forests in which the dominating trees are serotinous-coned conifers (CNPS 2010).

While The Cedars terrain is dominated by Sargent cypress woodland (*Hesperocyparis sargentii* (Jeps.) Bartel) and chaparral, the extremely steep canyon slopes are mostly open rock and talus forming extensive serpentine barrens. This open rock and talus is the only place that *Eriogonum cedrorum* grows... (From Reveal and Raiche 2009)

**Elevation:** 365 to 550 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

**Geology and Soils:** open serpentine rock and talus (Reveal and Raiche 2009) "Unless there is serpentine, and probably lots of it, it is extremely unlikely that ... *Eriogonum cedrorum*...[is] present." (Personal Communication, Raiche 2010).

### Species Associations:

Typical associates are these: *Asclepias solanoana* Woodson, *Aspidotis densa* (Brack.) Lellinger, *Cardamine californica* (Nutt.) Greene var. *sinuata* (Greene) O.E. Schulz, *Epilobium minutum* Lindl. ex Lehm., *Eriogonum luteolum* Greene, *E. nudum* Douglas ex Benth. var. *auriculatum* (Benth.) J.P. Tracy ex Jeps., *Hesperolinon spergulinum* (A. Gray) Small, *Minuartia douglasii* (Fenzl ex Torr. & A. Gray) Mattf., *Phacelia corymbosa* Jeps., *Sairocarpus vexillocalyculatus* (Kellogg) D.A. Sutton, *Streptanthus morrisonii*, and *S. barbiger* Greene. *Allium falcifolium* Hook. & Arn., *Eriophyllum lanatum* (Pursh) Forbes, and *Eschscholzia caespitosa* Benth. are more restricted to certain sites. (From Reveal and Raiche 2009)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas

- above 335 and below 580 m elevation (A 30 m elevation buffer was added around known elevational occurrences of this species)
- chaparral (i.e. Northern Mixed Chaparral and Scrub Oak).
- steep slopes (> 30%) in the above habitat.

Closed cone conifers and serpentine soils are not known to occur in the Study Area.

### Potential Occurrence on the Galbreath Wildlands Preserve:

*Habitat:* The Cedars Buckwheat occurs on serpentine rock and talus in chaparral and closed-cone coniferous forest. Potential habitat does not occur in the Preserve:

- Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar. Additionally, professional consultation with Roger Rachie (2010) confirmed that “Unless there is serpentine, and probably lots of it, it is extremely unlikely that ... *Eriogonum cedrorum*...[is] present.”
- Chaparral and closed-cone coniferous forest are not present on the Preserve.

### Nearest Occurrence:

Documented Occurrences on Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: This species is known from 5 occurrences in Sonoma County with the total population count at 1500 to 2000 individuals (CNPS 2010; Reveal and Raiche 2009). The nearest occurrence is approximately 18 miles southeast of the Study Area at The Cedars (Reveal and Raiche 2009). An occurrence on the Galbreath Wildlands Preserve would be a northern range extension for this species.



*Summary:* The Cedars Buckwheat is “Not Expected to Occur” on the Preserve because habitat is not present and occurrence at the Preserve would be an 18 mile northeast range extension.

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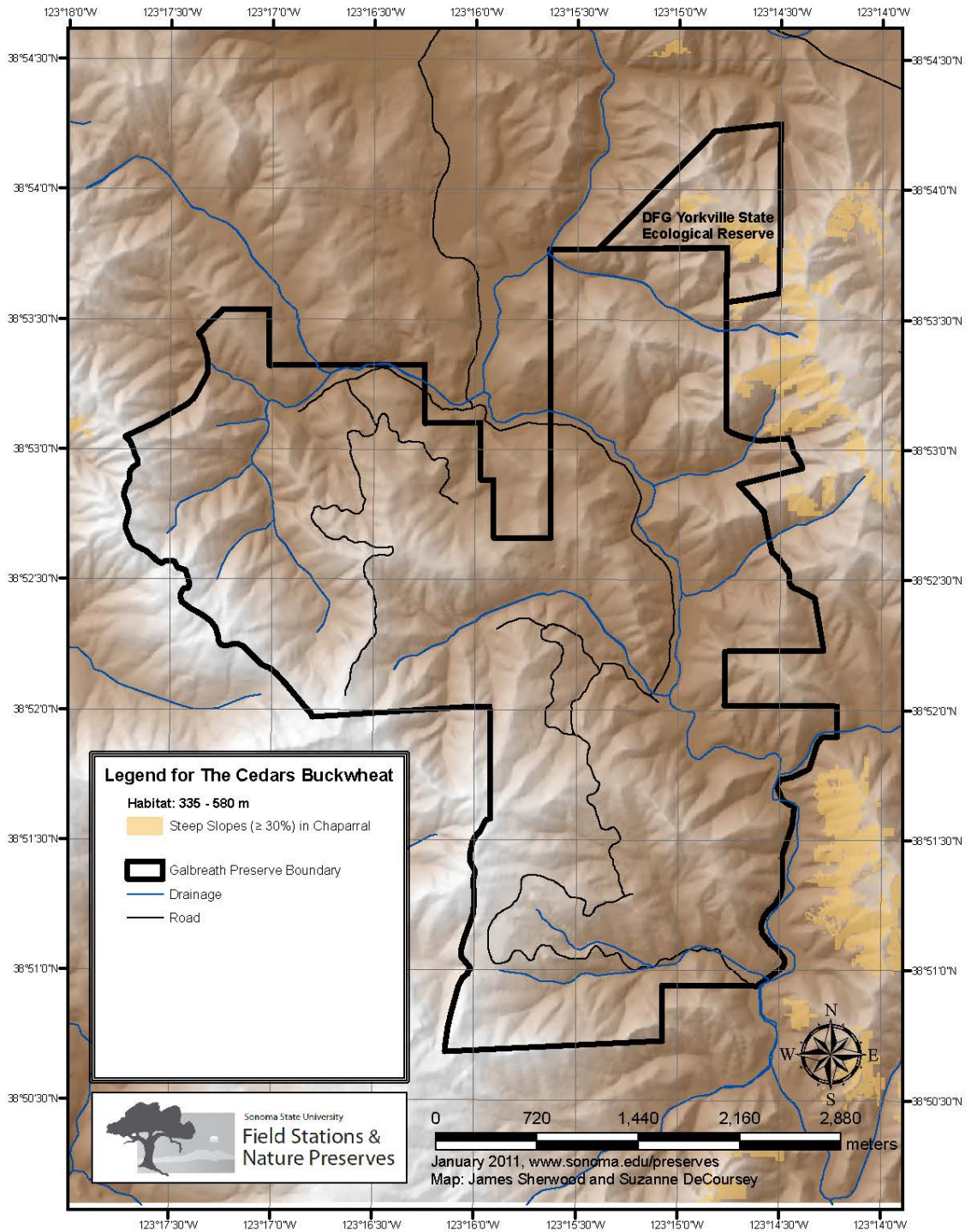
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**Species Account Description:** Linden Schneider

Figure 47: Potential habitat for The Cedars Buckwheat (*Eriogonum cedrorum*)



Magnoliopsida (Flowering Plants): Ranunculaceae  
**Oregon Goldthread (*Coptis laciniata*)**  
**Potential Occurrence: Unlikely to Occur**

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**Status:**

Federal: None

State: None

CNPS: 2.2

Other: None



**Species Description:** The Oregon Goldthread is a glabrous herb 11 to 24 cm in height with a yellow rhizome or stolon (CNPS 2010; Hickman 1996). It generally has 3 to 8 once ternate leaves with ovate to triangular leaflets that have 3 lobes, which are irregularly toothed or cut (Hickman 1996). The inflorescence is scapose, generally 1 to 3 flowered and umbel like in fruit (Hickman 1996). The flower has five greenish, petal like sepals and 5 to 7 claw to thread like white petals (Hickman 1996; Turner 2010). The fruit is 6 to 12 follicles with glabrous papery walls that are slightly translucent with smooth to wrinkled seeds (Hickman 1996).

**Nomenclature:** *Coptis laciniata* A. Gray Ranunculaceae (USDA 2010).

**Synonyms:** None

**Distribution:** This species occurs on the North Coast, the Coastal mountains, and in the west Klamath Range northward to Washington between 0 and 1,000 m (CNPS 2010; eFloras 2010; Hickman 1996)

**Life History & Threats:** The Oregon Goldthread is perennial and rhizomatous blooming from March to April (CNPS 2010).

This species ...is...a late-successional species that forms ground cover in old-growth forests (Vance et al. 2001). These factors make its habitat sensitive and the species relatively vulnerable to ecological disturbance such as logging of coastal forests. *Coptis laciniata* may also be threatened by collection of its roots for medicinal purposes... (From NatureServe 2009)

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Wet sites, seeps and stream banks in North Coast Coniferous forest dominated by needle leaved evergreen trees (CNPS 2010; Hickman 1996).

**Vegetation Types:** Mesic North Coast coniferous forests dominated by needle leaved evergreen trees (CNPS 2010).

**Topography and Microclimates:**

Given moderate summer watering or continuously moist or wet soil, grows especially well in **zones 4 and 5** and also in zone 17. Given full or part shade (morning and winter sun may be

tolerated) and moderate summer watering or continuously moist or wet soil, grows especially well in **zone 6** and also in zones 7, 15, and 16. (From Jepson Horticultural Database 2006)

*Elevation:* 0 to 1000 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).

*Geology and Soils:* Grows in the duff layer of soil (organic layer) (NatureServe 2009).

*Species Associations:* Grows among mosses and old growth conifers (NatureServe 2009; Turner 2010).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- all coniferous forests types (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens* *Pseudotsuga menziesii*) or Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*)) with a DBH > 61 cm (24 in)

A DBH of 102 cm (40 in) or more is considered old growth (Giusti 2007). Here we use the largest DBH category (> 61 cm) identified in GIS database.

We additionally mapped best habitat as areas within the above vegetation types as:

- streams

Springs and seeps are common throughout the Study Area but are not available in the GIS database

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Oregon Goldthread occurs in seeps and stream banks in mature coniferous forest. Quality of potential habitat in the Preserve for this species is poor to moderate. The most mature coniferous forests in the Preserve are secondary growth with a DBH > 61 cm that occur in sparse patches and rarely come in contact with watercourses (Figure 48). Seeps, however, are common in many habitats and could also provide the moist environments required by this species in areas with large conifers. The history of logging on the Preserve also suggests that potential habitat is poor in quality. Oregon Goldthread is vulnerable to disturbance such as logging. Timber harvest plans indicate that both clear cut and selection cut methods were used to harvest Redwood, Douglas Fir, and hardwoods in the Preserve between 1988 and 2000.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Oregon Goldthread occurs predominantly in coastal counties from Mendocino County northward. This species is known from 29 occurrences in Mendocino County (Calflora 2010), all of which occur 5-10 miles closer to the coast than the Preserve. The nearest occurrence to the

Galbreath Wildlands Preserve is approximately 16 miles to the northwest in the Garcia River watershed (Calflora 2010). Occurrence of this species on the Galbreath Wildlands Preserve would be a southeastern range extension (Calflora 2010).

*Summary:* We anticipate this species to be “Unlikely to Occur” because habitat quality is poor to moderate and an occurrence at the Preserve would be an inland range extension in Mendocino County.

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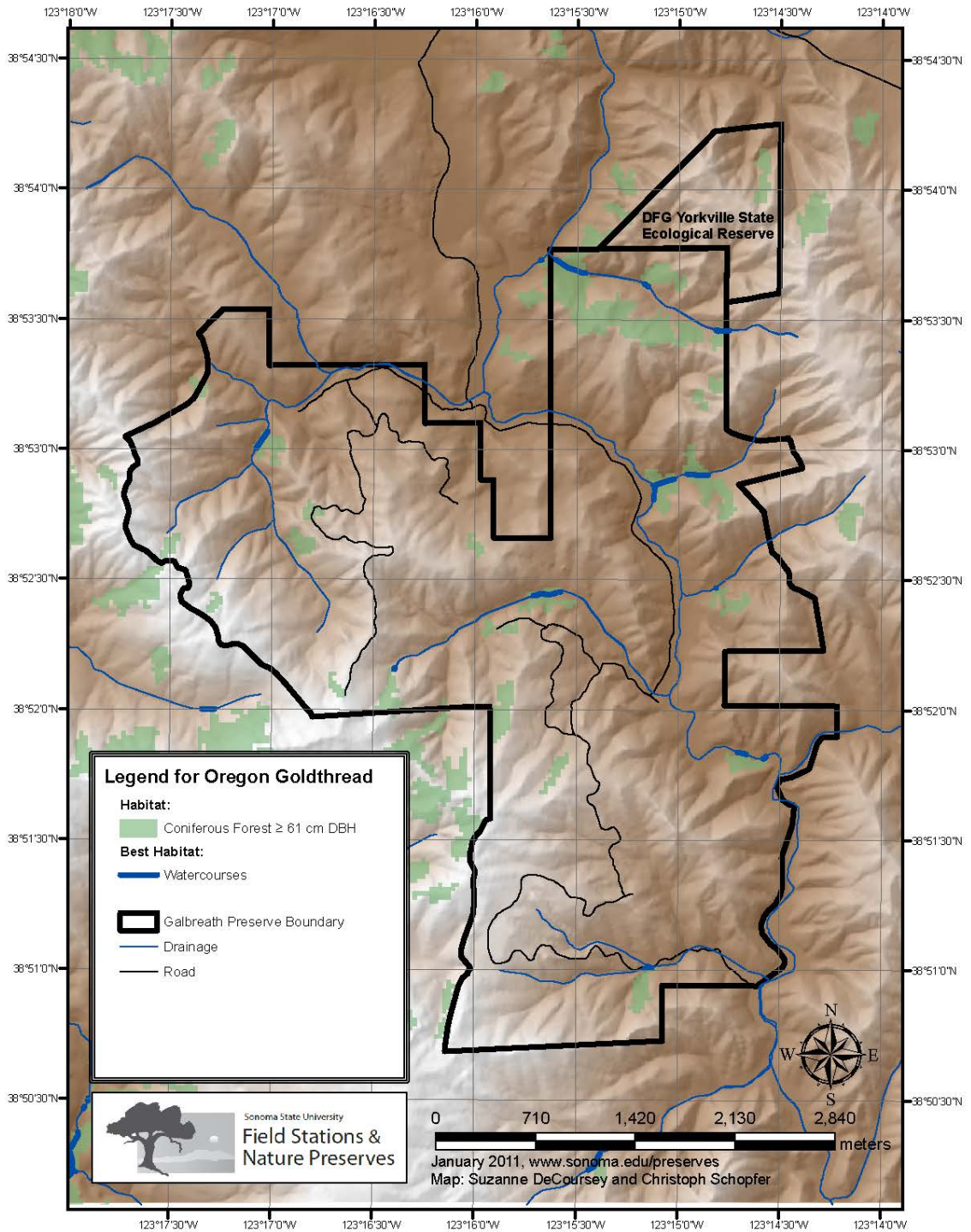
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**Species Account Description:** Linden Schneider

**Figure 48: Potential habitat for Oregon Goldthread (*Coptis laciniata*)**



*Magnoliopsida (Flowering Plants): Rhamnaceae*  
**Rincon Ridge Ceanothus (*Ceanothus confusus*)**  
**Potential Occurrence: Not Expected to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: BLM sensitive



**Species Description:** Rincon Ridge Ceanothus is prostrate to decumbent with angled twigs, red brown to gray brown, puberulent, stems which may root at nodes (Hickman 1996). The opposite, flat, oblanceolate or elliptic to obovate leaves have stipules, an obtuse tip, a turned under margin, a glabrous upper surface and a pale lower surface with hairy veins (Hickman 1996). The 3 to 5 teeth on the leaf margin are coarse and sharp (Hickman 1996). The inflorescence is raceme like with blue, lavender or purple flowers (Hickman 1996). The fruit is 5 mm with horns near the top, slender, not wrinkled with minute ridges (Hickman 1996).

**Nomenclature:** *Ceanothus confusus* J.T. Howell Rhamnaceae (USDA 2010)

**Synonyms:** *C. divergens* spp. *confusus*, *C. prostratus* ssp. *confusus* (Regents of the University of California 2010; NatureServe 2009)

**Distribution:** This species occurs in the southern North Coast Ranges in Mendocino, Lake, Napa and Sonoma counties (CNPS 2010; Hickman 1996).

**Life History & Threats:** Rincon Ridge Ceanothus is an evergreen, perennial, shrub that can reproduce both vegetatively (by rooting at nodes) and by seed (CNPS 2010; Hickman 1996). It flowers from February to June and is threatened by development, roads, dirt bike use, vineyard conversion, logging and grazing (CNPS 2010; Hickman 1996; NatureServe 2009).

**Habitat & Habitat Associations:**

**Vegetation Types:** Habitat for the species is closed cone coniferous forests in the which the dominating trees are serotinous-coned conifers, chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, and cismontane woodland dominated by trees that are deciduous, evergreen or both with open canopies (CNPS 2010).

**Topography and Microclimates:** Dry, shrubby, slopes (Hickman 21996).

**Elevation:** 75 to 1065 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).

**Geology and Soils:** volcanic (ash and basalt mix) or serpentine (CNPS 2010; Hursa and Gross 1995)

*Species Associations:* Observed with Chamise species (*Adenostoma sp.*) and Rincon Manzanita (*Arctostaphylos stanfordiana* ssp. *decumbens*) (Milo Baker Chapter CNPS 2005; Hursa and Gross 1995)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- cismontane woodlands (i.e. mixed, mixed montane, or single dominant hardwoods with canopy cover < 40%)
- chaparral (i.e. Northern mixed chaparral vegetation) or scrub oak

Note that closed cone conifers, volcanic soils, and serpentine soils are not present in the Study Area.

### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Rincon Ridge Ceanothus occurs on volcanic or serpentine soils in chaparral, cismontane woodland, and closed-cone coniferous forest. Habitat for this species is not present on the Preserve:

- Volcanic and serpentine soils do not occur in the Preserve. To verify the GIS information which does not show serpentine or volcanic soils as occurring in the Preserve, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine soils found were rocks exposed by road maintenance activity at a waterbar.
- Chaparral and closed-cone coniferous forest do not occur within Preserve boundaries. If appropriate soils did occur, potential habitat would be restricted to cismontane woodland.

### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: Rincon Ridge Ceanothus occurs in Mendocino County (3 occurrences), Sonoma County (75 occurrences), Lake County (15 occurrences) and Napa County (3 occurrences) (Calflora 2010). In Mendocino County the species is found northeast of the Preserve (Calflora 2010). The nearest occurrence is 6 miles northeast of the Galbreath Wildlands Preserve in the Upper Russian River watershed (Calflora 2010).

*Summary:* We anticipate this species to be “Not Expected to Occur” because the appropriate soil type is absent on the Galbreath Wildlands Preserve.

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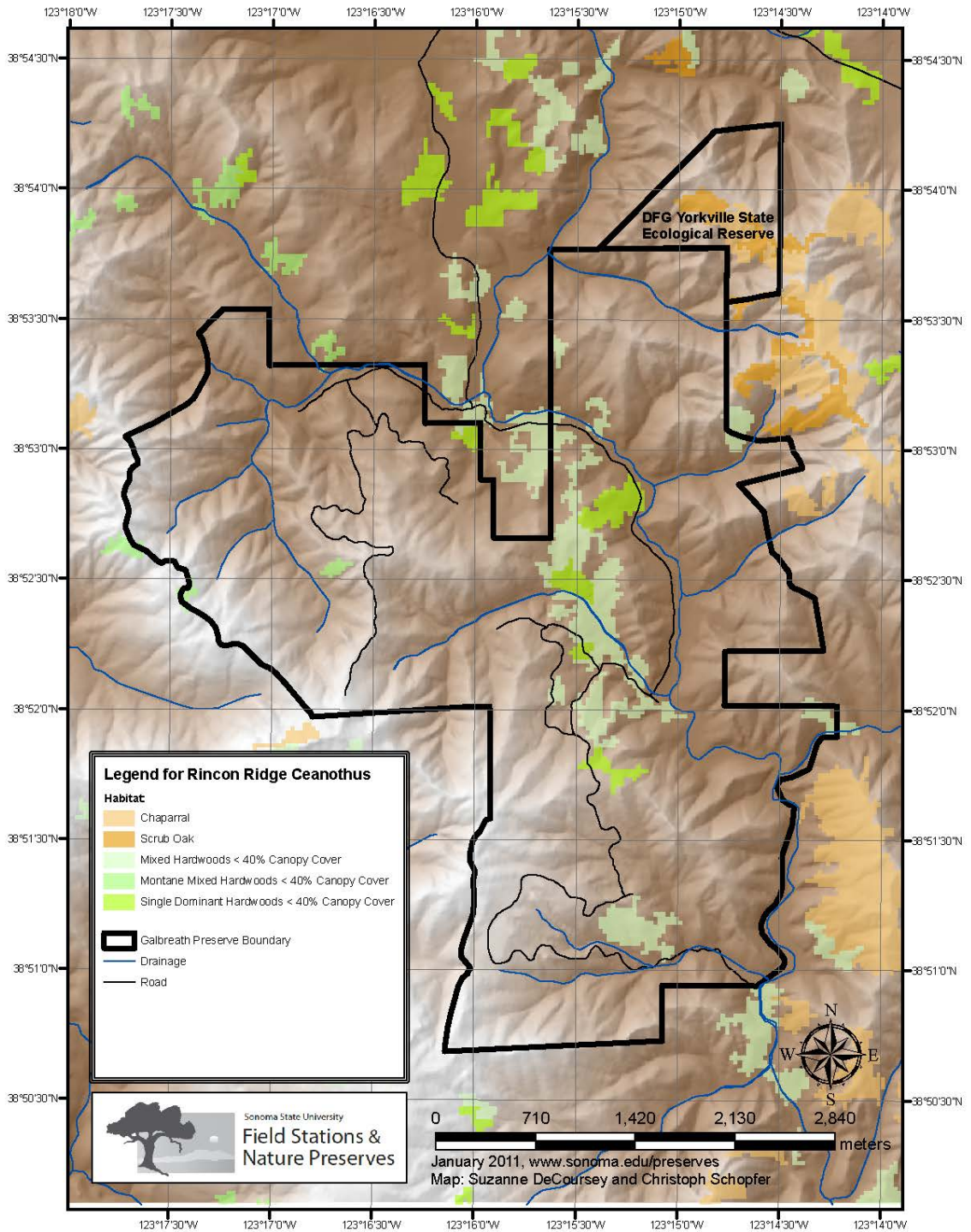
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**Species Account Description:** Linden Schneider

**Figure 49: Potential habitat for Rincon Ridge *Ceanothus* (*Ceanothus confuses*)**



**Status:**

Federal: None

State: None

CNPS: 1B.1

Other: None



**Species Description:** The Thin-Lobed Horkelia grows loosely matted, is generally green with more or less spreading hairs (Hickman 1996). The basal leaves are odd, once pinnate and flat with 8 to 15 leaflets per side which are divided into 3 to 8 linear to oblanceolate lobes with sparse to dense hairs (Hickman 1996). The inflorescence is a dense to open cyme with few to many flowers on pedicles of 1 to 6 mm (Hickman 1996). The flower has flat bottomed, cup shaped hypanthium with a hairy inner wall, linear to lanceolate bracts, 5 sepals and 5 white, oblanceolate petals (Hickman 1996). The fruit is a 1.5 mm achene (Hickman 1996).

**Nomenclature:** *Horkelia tenuiloba* (Torr.) A. Gray Rosaceae (USDA 2010)

**Synonyms:** None

**Distribution:** This species is found in the central and south North Coast and North Coast Ranges between 50 and 500 m in elevation (Hickman 1996).

**Life History & Threats:** This species is a perennial herb, which produces rhizomatous clones and blooms from May to July (CNPS 2010; Smith 2010).

Threats to some populations include trampling from hikers, trail maintenance, and invasion by broom grass and Eucalyptus. (From NatureServe 2009)

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** seasonal wetlands, moist openings (Sholars and Golec 2007; Ertter 1993)

**Vegetation Types:** Habitat for this species is open mesic, sandy areas in broadleaved upland forest dominated by evergreen or deciduous broadleaved trees more than 5 meters tall, chaparral dominated by mostly evergreen shrubs with thick, leathery leaves and stiff branches, valley and foothill grassland dominated by introduced Mediterranean grasses and native herbs and redwood forests (CNPS 2010; Sholars and Golec 2007).

**Topography and Microclimates:** open areas, full to partial light (Hickman 1996; Sholars and Golec 2007)

Given excellent drainage...and moderate summer watering, grows especially well in **zones 14, 15, 16, and 17** and also in zones 5, 7, 19, 20, 21, 22, 23, and 24. Good groundcover. (From Jepson Horticultural Database 2006).

*Elevation:* 50 to 500 m (CNPS 2010) (The Study Area ranges from 230 to 710 m).

*Geology and Soils:* sandy soils (Hickman 1996)

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as areas:

- below 530 m elevation (includes a 30 m buffer around known elevational occurrences for this species).
- grasslands
- chaparral (i.e. Northern Mixed Chaparral or scrub oak)
- open hardwood forest and woodland (i.e. mixed, mixed montane or single dominant hardwoods with canopy cover < 40%)
- redwood forest (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*))

We additionally mapped possible best potential habitat in the areas identified above as:

- sandy soils (sandy loam)
- soils with both poor drainage and high water capacity

Data on springs, seeps and wetlands is not available for mapping in the GIS database.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Thin-Lobed Horkelia occurs in seasonally moist, open areas of grasslands, chaparral, woodlands, and coniferous forests. The quality of potential habitat within the Preserve is moderate. While sandy loam soils preferred by this species are rare within Preserve boundaries, springs and seeps are common in most habitats, and grasslands, woodlands and coniferous forests are widespread.

#### *Nearest Occurrence:*

Documented Occurrences on the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Thin-Lobed Horkelia is known only from 3 coastal counties in California: Marin, Sonoma, and Mendocino. The nearest of the 15 documented occurrences in Mendocino County, is approximately 10

miles southwest of the Preserve in the McGuire Ridge quad in the Gualala River watershed (Calflora 2010).

*Summary:* Thin-Lobed Horkelia is “Likely to Occur” at the Galbreath Wildlands Preserve because habitat quality is moderate and the Preserve is within the range of this species.

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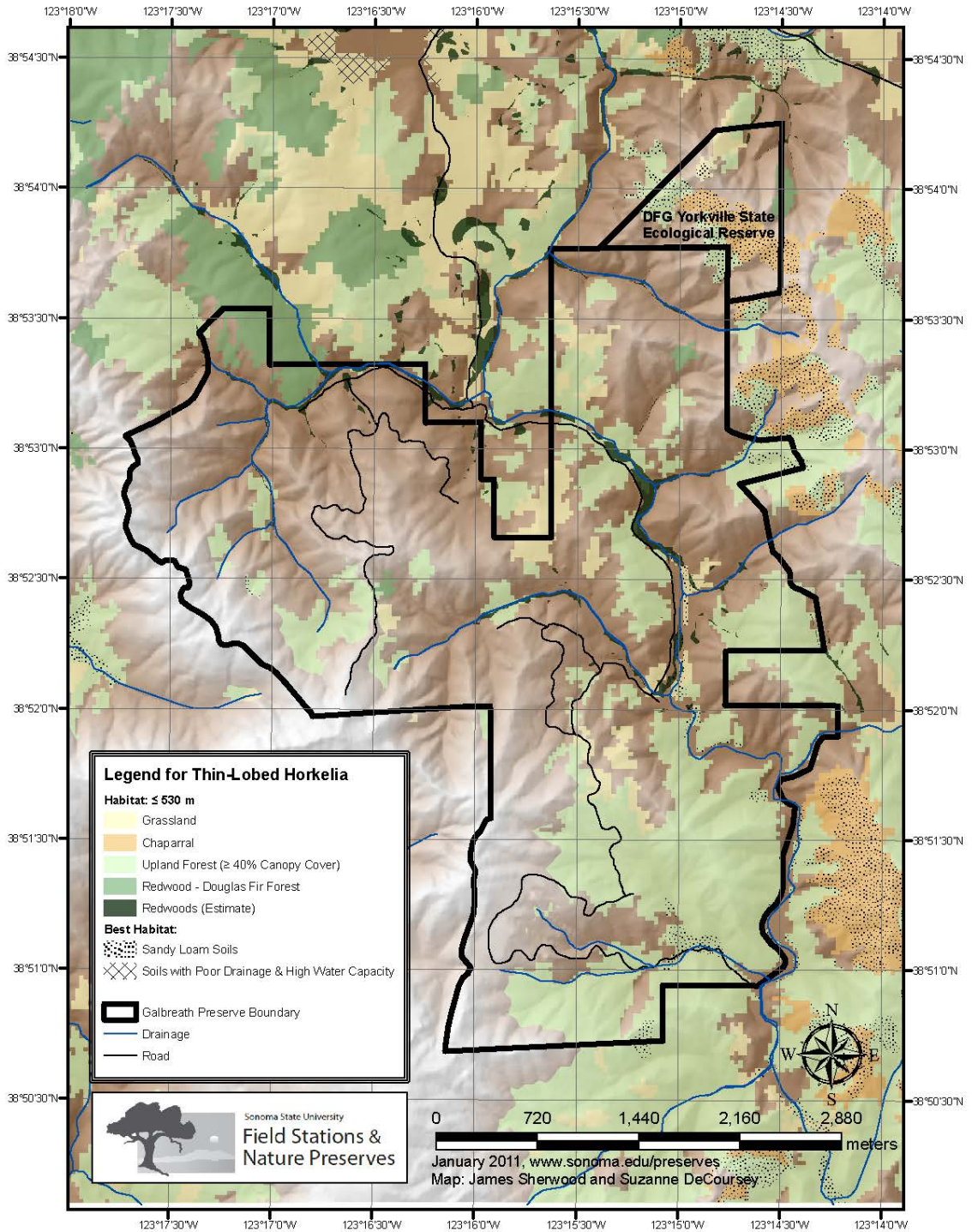
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**Species Account Description:** Linden Schneider

Figure 50: Potential habitat for Thin-Lobed Horkelia (*Horkelia tenuiloba*)



*Magnoliopsida (Flowering Plants): Rosaceae*  
**Pine Rose (*Rosa pinetorum*)**  
**Potential Occurrence: Not Expected to Occur**

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**Status:**

Federal: None

State: None

CNPS: 1B.2

Other: None



**Species Description:** The Pine Rose grows to be less than 1 meter tall with gray brown stems and many straight prickles which can be both slender and thick based (Hickman 1996). The leaves are once pinnate compound with glabrous to hairy, elliptic leaflets that have single to double toothed, glandular margins (Hickman 1996). The inflorescences are 1 to 5 flowered on 10 to 30 cm long pedicels which can be glabrous to glandular (Hickman 1996). The flowers have a glabrous, 4 mm wide hypanthium, glandular, entire sepals and white to red or yellow, 15 to 20 mm long petals (Hickman 1996). The fruit is a 12 mm wide achene (Hickman 1996).

**Nomenclature:** *Rosa pinetorum* A. Heller Rosaceae (USDA 2010)

This species account summarizes information for *Rosa pinetorum* sensu Ertter:

In other words, whereas *Rosa pinetorum* sensu Munz was a relatively common and widespread species, *Rosa pinetorum* sensu Ertter is a highly localized and possibly endangered plant. (From Ertter 2001)

**Synonyms:** *Rosa gymnocarpa* Nutt. var. *pinetorum* (A.Heller), *Rosa spithamea* f. *pinetorum* (A.Heller) Hoover, *Rosa woodsii* Lindl. f. *pinetorum* ( A.Heller ) Hoover (IPNI 2005)

**Distribution:** Due to the two different taxonomic treatments, the data available on distribution is variable.

CNPS (2010), Hickman (1996), Ertter (2001): *Rosa pinetorum* sensu Ertter: central and western Central Western California. From the Monterey Peninsula to the Carmel Highlands, Waddell Creek and Cambria. (Note that *Rosa pinetorum* sensu Ertter has special status ranking because it is highly localized and rare),

Calflora (2010) and CCH (2002): *Rosa pinetorum* sensu Munz: occurrence records are available throughout the State of California. (Note that *Rosa pinetorum* sensu Munz is relatively common without a special status rank)

Due to the taxonomic ambiguity of this species, we have chosen to provide a description and analysis for this species. However, it is clear that *Rosa pinetorum* sensu Ertter does not have potential to occur within the Preserve.

**Life History & Threats:** The Pine Rose is a dwarf, rhizomatous shrub blooming from May to July (CNPS 2010; Hickman 1996).

**Habitat & Habitat Associations:**

*Vegetation Types:* Habitat for this species is closed cone coniferous forests in the which the dominating trees are serotinous-coned conifers, Yellow Pine forest, Red Fir Forest, Redwood Forest, Mixed Evergreen, Pine woodlands, understory of open Monterey Pine (*Pinus radiata*) woodlands (Calflora 2010; CNPS 2010; Ertter 2001; Hickman 1996; Las Pilitas Nursery 2010).

*Topography and Microclimates:* canyons in moist microsites (Hickman 1996; NatureServe 2009)

Given excellent drainage (modification of compacted or other water-holding soils may be necessary) and part shade (morning and winter sun may be tolerated), grows in zones 4 and 5. From Jepson Horticultural Database 2006).

*Elevation:* 2 to 2,000 m (NatureServe 2009) (The Study Area ranges from 230 to 710 m)

*Species Associations:* sensu Ertter: Monterey Pine (*Pinus radiata*) (Ertter 2001).

**Conceptual Basis for GIS Model Development:** Potential habitat within the Study Area was mapped as areas:

- coniferous forests and woodlands (i.e. Redwood-Douglas fir mix (*Sequoia sempervirens*-*Pseudotsuga menziesii*) and Pacific Douglas fir (*Pseudotsuga menziesii* var. *menziesii*) vegetation types.

We additionally mapped possible best potential habitat in the areas identified above as

- canyons (i.e., steep-sided drainages)

None of the other coniferous vegetation types identified as potential habitat for this species occur in the Study Area.

**Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Pine Rose occur in moist canyons in coniferous forest in areas with serotinous-coned conifers, Yellow Pine, Red Fir, Redwood, Mixed Evergreen, or Monterey Pine. The quality of potential habitat for this species in the Preserve is poor to moderate. Only two of the coniferous forest types occupied by the species occur in the Preserve: redwood and douglas fir. The best quality habitat may be along stream drainages in steep sided canyons.

*Nearest Occurrence:*

Documented Occurrences in Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to Galbreath Wildlands Preserve: Pine Rose sensu Ertter is only known from the Monterey Peninsula to the Carmel Highlands, Waddell Creek and Cambria. (Note that Pine Rose sensu Munz occurs in counties scattered throughout



California. It is known from 2 occurrences in Mendocino County (Calflora 2010). These occurrences do not have coordinates. The nearest occurrence with precise location measurements is approximately 26 miles east of the Galbreath Wildlands Preserve in the Upper Cache Creek watershed in Lake County (Calflora 2010)).

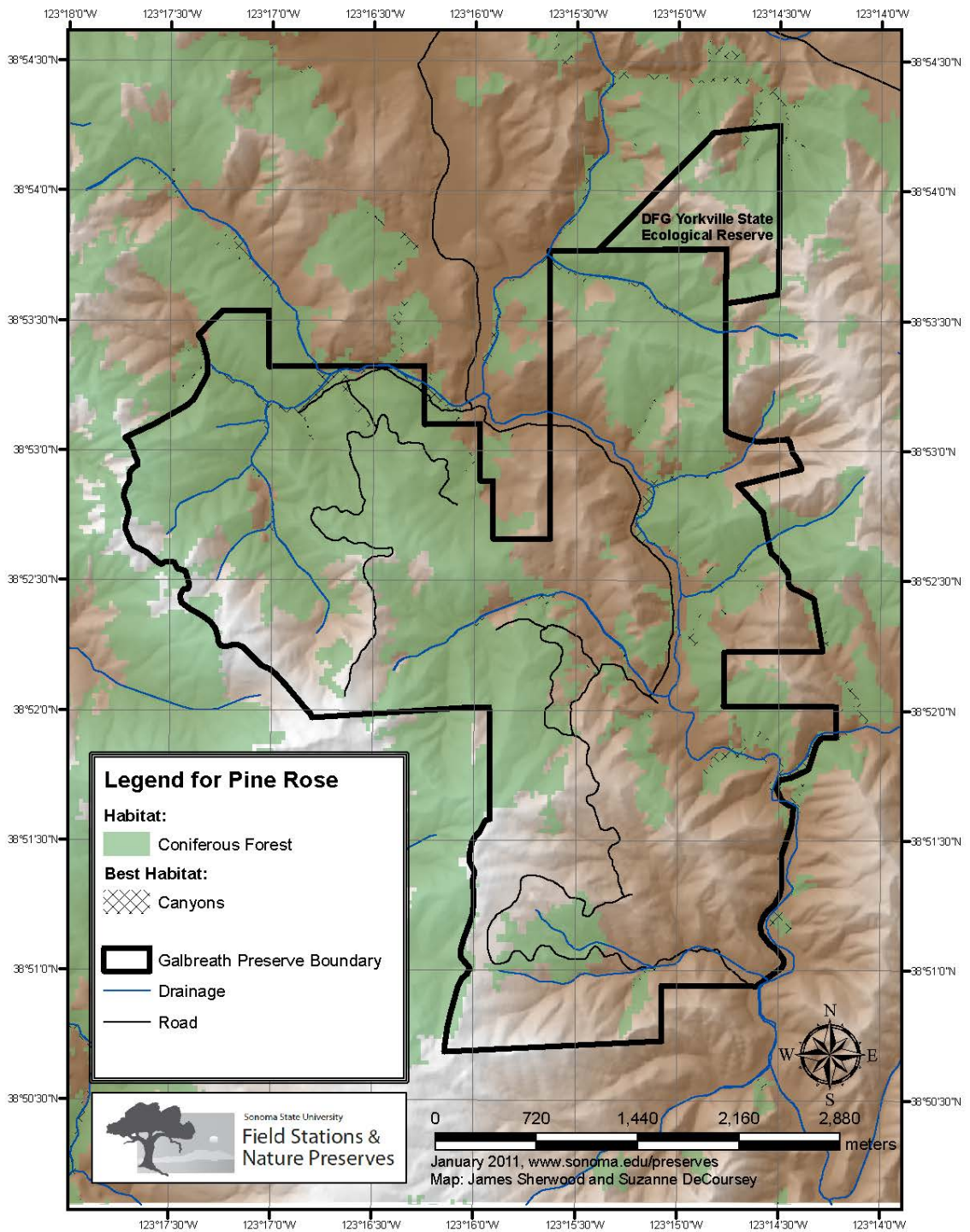
*Summary:* We anticipate the Pine Rose sensu Ertter is “Not Expected to Occur” because the Preserve is not within the range of this species.

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**Species Account Description:** Linden Schneider

Figure 51: Potential habitat for Pine Rose (*Rosa pinetorum*)



**Status:**

Federal: None

State: None

CNPS: 2.2

Other: None



Photos: Dr. Amadei Trnkoczv

**Species Description:** The Great Burnet grows from a thick, creeping rhizome to be between 50 and 140 cm and has alternate once pinnate leaves with 3 to 6 leaflets per side that are 25-50 mm long and ovate to oblong (Hickman 1996). The inflorescence is a 12 to 20 mm spike with more than 20 flowers (Hickman 1996). The flowers are bisexual with an urn shaped hypanthium, four elliptic to ovate dark purplish sepals, 2 to 4 stamens and a superior ovary (Hickman 1996). The fruit is composed of a hard, four angled, smooth and barely winged hypanthium enclosing achenes (Hickman 1996).

**Nomenclature:** *Sanguisorba officinalis* L. Rosaceae (USDA 2010)

**Synonyms:** *Sanguisorba muricata* Presl,(Regents of the University of California 2010)

**Distribution:** This species is found in the northern part of the outer North Coast Ranges of California and north to Alaska at elevations between 60 and 1,400 meters (CNPS 2010; Hickman 1996)

**Life History & Threats:** The Great Burnet is a perennial herb and blooms from July to October (CNPS 2010; Hickman 1996). This species is used in Traditional Chinese Medicine (eFloras 2008).

**Habitat & Habitat Associations:**

**Aquatic Habitat Types:** Habitat for this species is bogs and fens dominated by perennial herbs and low shrubs, seeps dominated by dense grasses, sedges, and herbs which thrive under seasonally moist to saturated conditions, and marshes and swamps dominated by emergent, suffrutescent herbs adapted to seasonally or permanently saturated soils (CNPS 2010).

**Vegetation Types:** Habitat for this species is open soil in broadleaved upland forest dominated by evergreen or deciduous broadleaves trees more than 5 m tall, North Coast coniferous forests dominated by needle leaved evergreen trees, riparian forests composed of broadleaved winter deciduous trees, and meadows dominated by dense grasses, sedges, and herbs, which thrive under seasonally moist to saturated conditions (CNPS 2010).

**Topography and Microclimates:** open soil (CNPS 2010)

**Elevation:** 60 to 1,400 m (CNPS 2010) (The Study Area ranges from 230 to 710 m)

*Geology and Soils:* Often on serpentine (CNPS 2010; Hickman 1996). This species is considered a strong indicator/broad endemic to serpentine soils with 85 to 95% of occurrences on ultramafics (Calflora 2010).

**Conceptual Basis for GIS Model Development:** Potential habitat in the Study Area was mapped as:

- broadleaf upland forest (i.e. mixed, mixed montane or single dominant hardwoods with > 40% canopy cover)
- North Coast coniferous forest dominated by needled evergreens (i.e. Redwood or Douglas fir vegetation types).
- riparian vegetation (i.e. 130 m buffer surrounding Rancheria Creek riparian scrub and forest. Note that riparian vegetation within the Rancheria Creek is disjunct within the polygon shown)
- seasonally moist to saturated soils in grasslands (i.e., “high” available water capacity or “poor” drainage areas in all grassland vegetation types)

The Study Areas does not contain bogs and fens, marshes or swamps. Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Study Area.

#### **Potential Occurrence in the Galbreath Wildlands Preserve:**

*Habitat:* Great Burnet occurs on open, frequently serpentine, soil in bogs, fens and seeps in grasslands and riparian, broadleaved, and coniferous forests. Quality of potential habitat for this species is poor in the Preserve.

- Serpentine soils, while common regionally, are not indicated by the GIS soil data as occurring in the Galbreath Wildlands Preserve. To verify the GIS information, we identified all areas (11 sites) of exposed rocky soils from high-resolution satellite imagery. During site visits to these areas, the only serpentine found were rocks exposed by road maintenance activity at a waterbar.
- Bogs and fens are not present on the Preserve, but seeps are generally abundant and occur in many habitats.
- Broadleaved riparian vegetation in the Preserve is restricted to the mainstem of Rancheria Creek and is extremely sparse. Riparian forest either occurs as isolated clumps of trees or thin strips along the banks of the river.

The best potential habitat for Great Burnet are springs and seeps in grasslands and upland and coniferous forest.

#### *Nearest Occurrence:*

Documented Occurrences in the Galbreath Wildlands Preserve: Previous species list for the Galbreath Wildlands Preserve did not document this species (SSU Field Station and Nature Preserves 2010).

Nearest Occurrence to the Galbreath Wildlands Preserve: Great Burnet is generally found in coastal counties of California from Mendocino County northward. This species is known from 14 occurrences in Mendocino County (Calflora 2010). The nearest occurrence is approximately 22 miles northeast of the Galbreath Wildlands Preserve in the Ukiah quad in the Upper Russian River watershed (Calflora 2010). Occurrence of this species on the Preserve would be a southern extension of its range (Calflora 2010).

*Summary:* We anticipate the Great Burnet to be “Unlikely to Occur” because serpentine soils do not occur on the Preserve and occurrence in the Preserve would constitute a southern range extension of 22 miles.

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**Species Account Description:** Linden Schneider

Figure 52: Potential habitat for Great Burnet (*Sanguisorba officinalis*)

