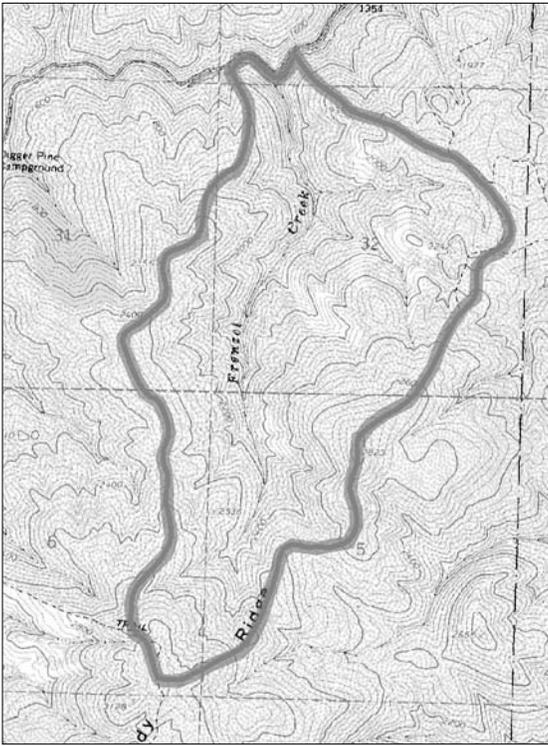


## 30. Frenzel Creek (Keeler-Wolf 1983)



**Figure 62—  
Frenzel Creek  
RNA**

### **Location**

This established RNA is on the Mendocino National Forest. The N. end of the area (39°17'N., 122°32'W.) lies 6 miles (10 km) SSW. of the town of Stonyford, Colusa County. It includes portions of sects. 31 and 32 T17N, R6W and sects. 5 and 6 T16N, R6W MDBM, USGS Gilmore Peak quad (fig. 62). Ecological subsection – Stony Creek Serpentine (M261Bc) and Western Foothills (M261Ca).

### **Target Elements**

Serpentine Chaparral, Sargent Cypress (*Cupressus sargentii*), and MacNab Cypress (*Cupressus macnabiana*)

### **Distinctive Features**

**Distribution and Regeneration of Sargent and MacNab Cypress:** These are the only two sympatric species of cypress in California. MacNab cypress is an interior, xerophilic cypress, occurring on ridgetops, never overlapping with Sargent cypress in the drainage. Sargent cypress is a mesophilic coastal type near its most inland distribution here (fig. 63). Hybridization was not seen in the RNA and is rare

elsewhere (Griffin and Critchfield 1976). Sargent is apparently less fire-dependent than MacNab, regularly reseeding in riparian areas of drainage, without fire. In contrast, MacNab cypress rarely reseed without fire. Sargent cypress is relatively shade-tolerant in the seedling stage.

**Numbers and Types of Serpentinite Endemics:** About 36 taxa in the RNA are generally considered serpentinite endemics or indicators (Kruckeberg 1984). Most are herbaceous neo-endemics; five are likely to be paleo-endemics (Raven and Axelrod 1978).

**Rare Flora:** Eight taxa found in the drainage are listed by CNPS, including *Astragalus clevelandii* (List 4), *Antirrhinum subcordatum* (List 1B), *Hesperolinum drymarioides* (List 1B), *Mimulus brachiatus* (List 3), *Mimulus glaucescens* (List 4), *Senecio clevelandii* (List 4), and *Streptanthus morrisonii* (List 1B).

**New and Undetermined Taxa:** Two plant taxa, *Castilleja miniata* ssp. nov. and *Allium cratericola* ssp. nov., have been collected in the RNA. The *Castilleja* was collected for the first time during the fieldwork for the RNA ecological survey. It is a serpentine riparian species locally common at Frenzel Creek and along portions of Little Stony Creek. It also was seen at Cook's Springs, about 2 miles (3 km) E. of the RNA. L. Heckard of the Jepson Herbarium believes this is a distinctive subspecies of the widespread *C. miniata* complex. The *Allium* occurs on serpentinite barrens and has previously been collected in the inner N. Coast Ranges by Dale McNeal and his students at University of the Pacific, but it is still undescribed.

### **Physical Characteristics**

The area covers 935 acres (378 ha). Elevations range from 1390 to 3090 ft (424-942 m). The entire drainage of Frenzel Creek, a small N.-flowing, permanent tributary of Little Stony Creek, is included. Slopes are predominantly E.- and W.-facing and steep, except for the majority of the two main ridgetops. Rocks are

primarily serpentinized peridotite, with a small area of Lower Cretaceous Franciscan sediments and metasediments at the head of the drainage. Climate is typical for this elevation in N.-central California. Mean annual precipitation is about 32-38 inches (813-965 mm); more than 90 percent is rain.

### Association Types

Vegetation sampling consisted of five 100-m<sup>2</sup> plots in the Sargent cypress dominated area, and six 100-m<sup>2</sup> plots in the MacNab cypress stands. Acreage of each type is based on the ecological survey (Keeler-Wolf 1983), and the sum does not match the total area.

**Serpentine Chaparral (37600, 71321, 83220):** 580 acres (235 ha). Two subtypes are divided into four phases.

The mixed subtype 1 is most extensive, dominated by *Arctostaphylos viscida* and *Quercus durata*, with *Ceanothus jepsonii* var. *albiflorus*, *Garrya congdoni*, *Heteromeles arbutifolia*, and *Eriodictyon californicum*. It includes the *A. viscida* phase on most xeric exposures; the *Q. durata* phase dominates on E., NE., and NW. exposures. Foothill pine (*Pinus sabiniana*) forms a very open canopy in some places. Thirty-five species of herbs are listed as typical for this subtype, including the serpentine endemics *Allium falcifolium*, *Clarkia gracilis* ssp. *albicaulis*, *Claytonia gypsophylloides*, *Calystegia subcaulis*, *Nemacladus montanus*, *Senecio greenei*, *Silene campanulata* ssp. *glandulosa*, and *Streptanthus breweri*.

Subtype 2 is dominated by MacNab cypress (51 acres, 21 ha). Two phases occur: exposed and sheltered. The exposed phase on ridgetops is most extensive, with subdominant serpentine chaparral shrubs and relatively high cover of *Adenostoma fasciculatum*. Stands are of uniform height (3-4 m) and age (mostly 60-80 years). Herbs are similar to mixed serpentinite chaparral. The sheltered phase is restricted to N. slopes and heads of ravines. MacNab Cypress is more often a tree up to 7 m tall and 64 cm dbh. Density of woody plant stems varies from 2400 to 9600/ha. Basal area of MacNab cypress ranges from 2.7 m<sup>2</sup>/ha on the 1950 burn to 86 m<sup>2</sup>/ha on the sheltered phase.

**Serpentine Barrens (no Holland equivalent):** 81 acres (33 ha). Vegetation is very sparse and herb dominated. Species include *Streptanthus morrisonii*, *S. breweri*, *Allium cratericola* ssp. nov., *Asclepias cordifolia*, *A. solanoana*, *Eriogonum vimineum*, *E. nudum*, *E. dasycarpum*, and *E. ursinum* var. *nervulosum*.

**Non-Serpentinite Chaparral (37110, 37E00):** 66 acres (27 ha). Two subtypes (mesic and xeric) occur. The mesic subtype occurs on NE.-facing slopes and is dominated by tall shrubs of *Cercocarpus betuloides*, *Ceanothus cuneatus*, *Quercus wislizenii* var. *frutescens*, and *Heteromeles arbutifolia*. Herbs are often dense and include 20 typical species, the majority of which are not present on serpentinite chaparral.

The xeric subtype occurs on ridgetops and is dominated by thick stands of *Adenostoma fasciculatum* and *Ceanothus cuneatus* with lesser numbers of *Arctostaphylos manzanita*, *A. glandulosa*, *A. canescens*, *Quercus wislizenii* var.



**Figure 63—**  
**Frenzel Creek,**  
looking up the  
Frenzel Creek  
drainage. Taken  
from about half way  
up the east slope  
and about 200  
yards from the  
mouth. Sargent  
cypress can be seen  
in the valley bot-  
tom, foothill pine in  
the foreground, and  
chaparral in the  
background. (1970)

*frutescens*, *Q. durata*, *Q. x morehus*, *Heteromeles arbutifolia*, *Cercocarpus betuloides*, *Ribes malvaceum*, and *Haplopappus linearifolius*. Herbs and grasses are few, with annual *Bromus* dominant.

**Serpentinite Riparian and Valley Bottom (83220 in part):** 57 acres (23 ha). This is the most hydrophilic vegetation in the RNA. It is subdivided into three types: strict riparian (permanent water), mesic valley bottom (moist and shady, but no year-round water), and rivulet herbaceous association (along intermittent, sunny streams). Characteristic woody species of the strict riparian type include *Rhododendron occidentale*, *Salix breweri*, *Calycanthus occidentalis*, Sargent cypress, and *Rhamnus californica* ssp. *crassifolia*. Understory species include *Aquilegia exima*, *Achillea millefolium*, *Lilium pardalinum*, *Stachys albens*, *Epipactis gigantea*, *Castilleja miniata* ssp. nov., *Carex serratodens*, *Scirpus americanus*, *Senecio clevelandii*, *Heleocharis* sp., *Helenium bolanderi*, *Angelica tomentosa*, and *Juncus mexicanus*.

The mesic valley bottom type is dominated by Sargent cypress and California bay (*Umbellularia californica*) (often mutually exclusive). Other woody species include *Ceanothus integerrimus* var. *californicus*, *Rhamnus californicus* ssp. *crassifolius*, *Toxicodendron diversilobum*, and *Cercis occidentalis*. Many species of herbs are shared with adjacent serpentinite chaparral. Tree densities range from 700 to 6200/ha. Seedling densities (all Sargent cypress) range from 100 to 600/ha. Basal area ranges from 6.5 to 72.3 m<sup>2</sup>/ha. Mean dbh ranges from 3.5 to 31.0 cm.

The rivulet herbaceous association type species include *Mimulus brachiatus*, *Centaureum* sp., *Mimulus bicolor*, *M. glabrescens*, *Epilobium minutum*, and *Gayophytum* sp. Shading restricts growth of the characteristic herbs.

**Pine-Oak Woodland (71322, 83210):** 36 acres (15 ha). This association occurs on N., NE., and NW.-facing slopes at the head of the drainage, off serpentinite. Canyon live oak (*Quercus chrysolepis*) is dominant, with knobcone pine (*Pinus attenuata*) and, occasionally, foothill pine emerging from the canopy. Understory species are *Cercocarpus betuloides*, *Heteromeles arbutifolia*, *Arctostaphylos manzanita*, *A. canescens*, *Toxicodendron diversilobum*, *Berberis dictyota*, *Lotus crassifolius*, *Cynoglossum grande*, *Symphoricarpos acutus*, *Ribes californicum*, *Dodecatheon hendersonii*, *Sanicula crassicaulis*, and *Keckiella lemmonii*.

**Non-Serpentinite Riparian (no Holland equivalent):** 3 acres (1 ha). This association is restricted to a small area of Frenzel Creek on Franciscan rocks. Species include California bay (dominant), Fremont cottonwood (*Populus fremontii*), *Salix laevigata*, *Sambucus mexicana*, *Vitis californica*, *Rubus ursinus*, *Rhus trilobata*, *Clematis ligusticifolia*, *Potentilla glandulosa*, *Cystopteris fragilis*, *Adiantum jordanii*, *Perideridia kelloggii*, *Lotus* sp., and *Datisca glomerata*.

### **Plant Diversity**

One hundred eighty species are listed.

### **Conflicting Impacts**

Off-road vehicle use adjacent to the RNA may have light impact on upper drainage. Fire suppression practices may necessitate controlled burning to maintain MacNab cypress stands in the future.