

57. Millard Canyon (Keeler-Wolf 1988a, 1991f)

Location

This established RNA is on the San Bernardino National Forest about 9 miles (14.5 km) NE. of Banning in extreme N. Riverside County. The area lies within portions of sects. 2, 3, 10, and 11 T2S, R2E SBBM (34°01'N., 116°45'W.), USGS San Geronio Mountain quad (fig. 116). Ecological subsection – San Geronio Mountains (M262Bg).

Target Element

Interior Live Oak (*Quercus wislizenii*)

Distinctive Features

Interior Live Oak: Interior live oak is a widespread foothill species endemic to cismontane California. It is represented elsewhere most extensively on the Indian Creek RNA where it is typically shrubby. At Millard Canyon this species occurs primarily as a woodland or low forest in the relatively flat, alluvium-filled valleys (fig. 117). It also occurs as a shrub in the chaparral on steep, exposed slopes. The variety of situations in which this species is represented locally will provide a number of topics for researchers interested in this little-studied species.

Bigcone Douglas-Fir (*Pseudotsuga macrocarpa*)-Canyon Live Oak (*Quercus chrysolepis*) Forest: This association is endemic to S. cismontane California, and it is one of the associations least commonly affected by fire in this area. It occupies N.-facing slopes and has substantial variation in density and frequency of bigcone Douglas-fir, reflecting variation in fire history and moisture availability. This vegetation should provide an important comparison to the more coastal, high-density type of this association represented at the Falls Creek and Fern Canyon RNAs.

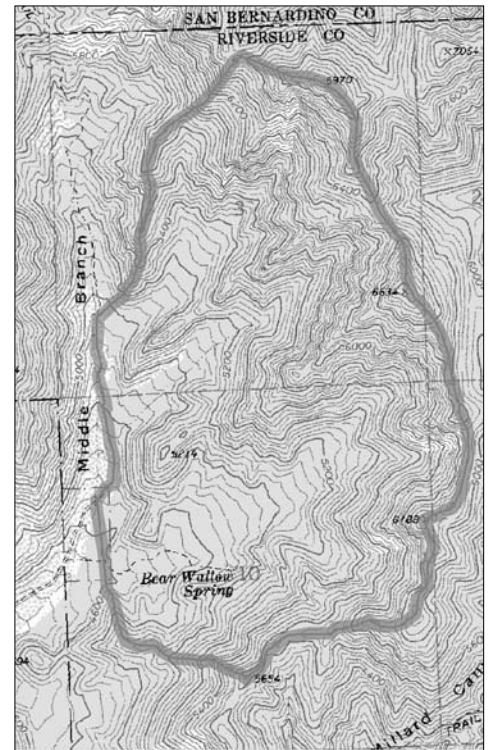
Rare Plants: Two taxa known from the RNA are listed by CNPS. These are *Heuchera parishii* (List 4) and *Streptanthus bernardinus* (List 1B). Both species are endemic to the San Bernardino Mountains.

Wildlife Values: The dense interior live oak woodland in the valleys provides food and shelter for numerous birds and small mammals. A breeding-bird census in this habitat records 128 individuals/10 ha. The most abundant species are rufous-sided towhee (*Pipilo erythrophthalalmus*), wrentit (*Chamaea fasciata*), and black-headed grosbeak (*Pheucticus melanocephalus*), all with densities of 1 to 2/ha. There is also a high density of dusky-footed woodrat (*Neotoma fuscipes*) housed in this association. Bear Wallow Spring, in the S. part of the RNA, has been developed for wildlife (with a cement trough) and is regularly used by black bear (*Ursus americanus*) and other species.

Physical Characteristics

The study area covers 793 acres (321 ha). Elevations range from approximately 4500 to 6970 ft (1372-2125 m). Topography is highly varied from the three gently sloping, relatively broad valley bottoms to the extremely steep and rocky escarpment at the N. end. The area contains three separate subdrainages of the Middle Branch of Millard Canyon with the valley bottoms sloping to the SW. Slopes face primarily NW. and SE.

Ridges are typically sharp and topped with crumbly outcrops of Precambrian igneous and metamorphic rocks (gneiss and schist). Many of these rocks are intruded and altered by Mesozoic granitics. Soils are mapped in three units: Lithic Xerothents-Springdale family-Rubble Land association, 50-100



**Figure 116—
Millard Canyon
RNA**

percent slopes; Lithic Xerothents-Rock Outcrop complex 50-100 percent slopes; and Soboba-Avawatz-Morical dry families. The latter type is characteristic of the deep alluvium of the valleys. The area is estimated to average 25-30 inches (635-762 mm) of precipitation per year. Mean annual temperature at the mid-elevations is about 52 °F (11 °C). Prevailing W. winds have shaped the vegetation of the upper slopes.

Association Types

Vegetation sampling is limited to the interior live oak woodland and the bigcone Douglas-fir-canyon live oak forest where ten 10- by 10-m quadrats were established in each association. Other associations are described qualitatively.

Canyon Live Oak-Bigcone Douglas-Fir (81320, 84150, 45400): 477 acres (193 ha). This association occurs in three phases: a low- to mid-elevation mesic NW- to NE-facing type with variable mixtures of bigcone Douglas-fir over a dense canopy of canyon live oak (*Quercus chrysolepis*); a semi-riparian, very mesic phase, with the above-mentioned two species as well as incense-cedar (*Libocedrus decurrens*), bigleaf maple (*Acer macrophyllum*), and California sycamore (*Platanus racemosa*); and an upper elevation S- to SW-facing type dominated solely by canyon live oak.



Figure 117—
Millard Canyon,
ecotone of canyon
live oak and interior
live oak forests at
north-facing slope
base in Millard
Canyon RNA.
(1987)

Vegetation sampling was conducted in only the first described phase (351 acres, 142 ha). This steeply sloping forest is relatively dense, averaging 1810 trees more than 6.5 ft (2 m) tall/ha. Mean canopy cover is 74 percent, and basal cover is about 32.8 m²/ha. Canyon live oak has a relative density of 89 percent; however, bigcone Douglas-fir makes up 43 percent of the basal area. High stem density of canyon live oak results from the preponderance of multiple-stemmed individuals, reflecting past fires. Tree reproduc-

tion is relatively low and dominated by canyon live oak. The understory is generally sparse, with locally abundant herbs and grasses in scattered small openings. *Melica aristata* is most common, with an average cover of 12 percent. Another fairly common species is *Silene lemmonii* (22 species are listed from the sample).

A small area of about 4 acres (1.5 ha) surrounding Bear Wallow Spring is considered a semi-riparian phase of this association. The moist, shady conditions around the spring, coupled with an absence of fire, have combined to produce a tall, well-developed forest of bigcone Douglas-fir (up to 5.7 ft [1.73 m] dbh and 121 ft [37 m] tall), canyon live oak (up to 3.3 ft [1 m] dbh), incense-cedar (up to 4.6 ft [1.4 m] dbh), bigleaf maple, and California sycamore. The understory in the immediate vicinity of the spring is dominated by *Potentilla glandulosa*, *Aquilegia formosa*, and *Ribes nevadense*

(Holland 45400). However, once away from the spring, the understory is sparse with much duff, only occasional herbs such as *Polystichum munitum*, and scattered tree seedlings and saplings.

On the S.-facing slopes at upper elevations canyon live oak forms continuous or broken stands depending on slope rockiness and steepness (122 acres, 49 ha). These stands are typically wind-sculpted dwarfs no taller than 20 ft (6 m) with average dbh of 10 inches (25 cm). The understory of these stands is sparse.

Interior Live Oak Woodland (37A00, 71150, 81330): 128 acres (52 ha). In general, the best developed of the interior live oak vegetation has a woodland aspect, with scattered small openings between clumps of small trees. However, there is some variation in the stature of tree clumps, the associated shrub and herbaceous species, and the density of stands. Although the northernmost valley has a significant admixture of canyon live oak, the remaining two are strongly dominated by interior live oak, largely to the exclusion of other trees. Only occasional young individuals of white fir (*Abies concolor*), bigcone Douglas-fir, incense-cedar, and Coulter pine (*Pinus coulteri*) rise above the short canopy of the oaks.

All of the trees aged in this association have stems younger than 75 years old, reflecting the date of the last extensive fire (1911). Average tree-stem density is 1300/ha. Frequency for interior live oak is 100 percent on 10 plots, and basal area cover averages 16 m²/ha. Sapling density for interior live oak averages 260/ha and seedling density 90/ha. Estimated mean canopy cover is 65 percent. The number of shrub species encountered is 13. Twenty-one herbs are noted. The most important subordinate species are *Rhamnus californica*, *Lonicera interrupta*, *Rhus trilobata*, *Eriodictyon californicum*, *Vulpia (Festuca) myuros*, and *Bromus tectorum*. A small subset of herbs does not occur in chaparral or sage scrub. These include *Bloomeria crocea*, *Brodiaea pulchella*, *Microseris linearifolia*, *Melica imperfecta*, *Lupinus adsurgens*, and *Bromus diandrus*.

Chaparral (37110, 37200, 37520): 106 acres (43 ha). Chaparral typically occurs as small islands or in impure mixtures with sage scrub, interior live oak woodland, canyon live oak forest, and mixed conifer forest. Four main subtypes are distinguishable.

- Chamise chaparral dominated by *Adenostoma fasciculatum* is the most xeric subtype. It occurs as small, nearly pure patches on W.- and SW.-facing slopes. There is virtually no herb layer.
- The next subtype (37110) is mixed chaparral. It occurs on low and middle elevations on W.- and SW.-facing slopes. Dominants vary and include shrubby interior live oak, *Arctostaphylos glandulosa*, and *Ceanothus leucodermis*. Lesser species include *Cercocarpus betuloides*, *Arctostaphylos pringlei* var. *drupacea*, *Dendromecon rigida*, *Prunus ilicifolia*, and *Yucca whipplei* ssp. *parishii*.
- The third subtype (no Holland equivalent) is strongly dominated by *Cercocarpus betuloides*. This species forms an open scrub along the low- and mid-elevation ridgelines. It prefers extremely rocky sites where perhaps relatively large quantities of surface water are channeled into cracks and crevices.
- The final subtype (37520) has a more montane character, occurring at the higher elevations along ridgetops above 6200 ft (1890 m). The dominant is *Arctostaphylos patula* ssp. *platyphylla*, a low nodal-rooting manzanita.

Riversidian Sage Scrub (32700): 38 acres (15 ha). This association occurs on the most xeric exposures in the study area, on relatively deep sandy soils. It occupies S.-facing exposures between 4600 and 6100 ft (1402-1959 m). On relatively gentle slopes at low elevations it intergrades with interior live oak woodland. At upper elevations it intergrades with the S.-facing phase of canyon live oak woodland.

The following species are typical of this association: *Salvia apiana*, *Yucca whipplei* ssp. *parishii*, *Penstemon centranthifolius*, *Stipa coronata*, *Galium angustifolium*, *Eriogonum fasciculatum*, *Mimulus longiflorus*, *Trichostema lanatum*, *Antirrhinum coulterianum*, *Bromus rubens*, *Castilleja foliolosa*, *Cordylanthus filifolius*, *Corethrogyne filaginifolia*, *Cryptantha muricata*, *C. simulans*, *Eriophyllum confertiflorum*, *Gilia diegensis*, *Lotus strigosus* var. *hirtellus*, and *Stipa speciosa*.

At the upper elevations there is a transition with canyon oak and mixed chaparral associations and several montane species such as *Leptodactylon pungens*, and *Lupinus excubitus* var. *austromontanus* occur along with such upper-elevation chaparral species as *Arctostaphylos pringlei* var. *drupacea*.

Transitional Mixed Conifer Forest (84230, 84140): 28 acres (11 ha). This forest occupies upper N.- to W.-facing slopes. It is an extension of the canyon live oak-bigcone Douglas-fir forest with the addition of sugar pine (*Pinus lambertiana*), Coulter pine, and white fir. Elevations are not high enough locally to provide conditions that are favorable for strong dominance by conifers; at best, this forest is codominated by canyon live oak and a mixture of conifers. This association is analogous to the transitional S. California mixed evergreen forest of Falls Canyon RNA. The canopy of conifers is varied, from Coulter pine on W.-facing slopes to a sparse mixture of bigcone Douglas-fir, sugar pine, and white fir on steep NW.-facing slopes to a more dense mixture of white fir and sugar pine on N.-facing slopes.

The understory is usually sparse with scattered shrubs of *Arctostaphylos patula* ssp. *platyphylla*, *Cercocarpus ledifolius*, and the herbs *Heuchera parishii*, *Claytonia spathulata* var. *tenuifolia*, *Sarcodes sanguinea*, *Hieracium horridum*, *Allium monticola*, *Streptanthus bernardinus*, and *Pedicularis semibarbata*.

Occasional ridgetop openings in this association house a richer herbaceous flora including *Eriogonum wrightii*, *Lupinus excubitus* var. *austromontanus*, *Linanthus breviculus*, *Gayophytum* sp., *Poa* sp., *Penstemon grinnelli*, *Solidago californicum*, *Chrysothamnus nausiosus* ssp. *bernardinus*, *Chaenactis santolinoides*, *C. glabriscula* var. *curta*, and *Bromus marginatus*.

Rock Outcrop (no Holland equivalent): 20 ha (8 ha). Between the scattered small trees of canyon live oak and *Cercocarpus* spp., much of the steep escarpment at the N. end of the area as well as other smaller outcrops is vegetated with a light cover of small rupicolous shrubs and herbs. These include *Dudleya abramsii*, *Selaginella bigelovii*, *Eriogonum saxatile*, *Haplopappus cuneatus*, and *Arabis sparsiflora* var. *arcuata*.

Plant Diversity

One hundred sixty-three taxa are listed.

Conflicting Impacts

Few exist. The area is within a 1984 addition to the San Geronio Wilderness, but rugged topography and dense vegetation preclude recreational interest. A short trail to Bear Wallow Spring is the only easy recreational entry route into the area, and it is not well traveled.