14. Cahuilla Mountain (Keeler-Wolf 1986a, 1989j)

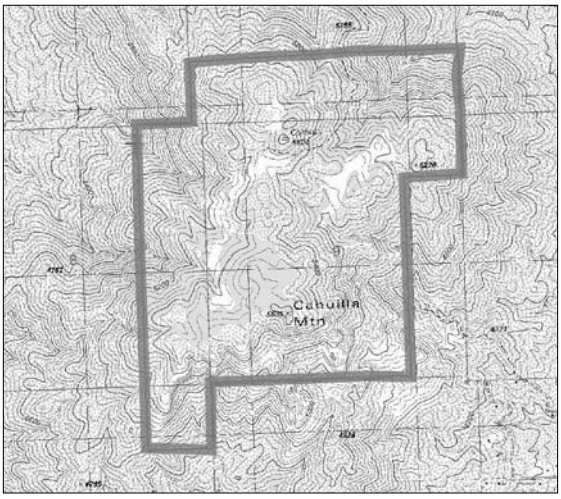

Figure 28—Cahuilla Mountain RNA

Location

This established RNA is on the San Bernardino National Forest, Riverside County. It is about 11 miles (18 km) SW. of the town of Idyllwild. The area lies within portions of sects. 4, 8, 9, and 17 of T7S, R2E SBBM (33°35'N., 116°47'W.), USGS Cahuilla Mountain quad (*fig. 28*). Ecological subsection – San Jacinto Mountains (M262Bm).

Target Elements

Coulter Pine (*Pinus coulteri*) and California Black Oak (*Quercus kelloggii*)

Distinctive Features

Coulter Pine: Coulter pine woodland reaches its optimum development in the mountains of S. California (Holland 1986). This RNA contains diversely developed, well-defined stands of this vegetation showing a range from scattered old trees, to a large cohort of trees 50-60 years old, to a number of saplings and seedlings.

California Black Oak: California black oak vegetation is widespread in California, but varies in its components and site characteristics. The stands of black oak at Cahuilla Mountain represent great variation in density, successional state, and associated species. They range from pure and relatively dense black oak, to open black oak savanna, to mixed woodlands of pine and oak.

Native Grass- and Herb Lands: The openings dotting the summit of the area are dominated by native herbs, grasses, and subshrubs that often have been swamped out by aggressive non-natives in such openings elsewhere in S. California. These openings have been free of livestock grazing for many years and are a mixture of coastal sage, Great Basin sagebrush, mid-montane, and valley grassland species (*fig. 29*). In some cases they occur as a melange, and in some cases as distinct units. The close association of so many different biogeographic elements, which are often separated by many miles, offers some unique research opportunities.

Rare Plant: A population of *Delphinium hesperium* ssp. *cuyamacae* (CNPS List 1B) occurs in one of the grassy openings.

Successional Trends: There is a dynamic relationship between the major vegetation types in the area based on the frequency and intensity of fire. Several forms of chaparral are presently giving way to Coulter pine and black oak vegetation. The date and extent of the last fire in the area is known (1928), and there is a record of aerial photos extending back to at least 1948. These baseline data coupled with analysis of growth and colonization rates of the principal species could provide many answers to questions regarding sound ecological guidelines for fire management of these vegetation types.

Physical Characteristics

The original survey area covers 880 acres (356 ha). Final established boundaries include 929 acres (376 ha). Elevations range from 4360 ft (1329 m) at the NE. corner to 5635 ft (1718 m) atop the S. summit of Cahuilla Mountain. However, the majority of the area lies above 5200 ft (1585 m). The RNA encompasses the summit and upper slopes of the mesa-like mountain. All slope exposures are well represented.

The area is underlain by two rock types. The specta-cular S. escarpment is composed of Cretaceous granitic rock (S. California Batholith); the remainder of the rocks are part of a series of older (as old as Carboniferous) intrusive and migmatic rocks (principally granitics and gneiss, with small areas of schist and marble). Soils have been divided into four map units: Morical and Wind River families complex 15-30 percent slopes; Trigo family-Lithic Xerothents, Warm complex 50-75 percent slopes; Lithic Xerothents, Warm-Rock Outcrop complex 50-100 percent slopes; and Rock Outcrop. Mean annual temperature for the mountain is about 53 °F (11.7 °C). Snow falls regularly in the winter. Average annual precipitation is estimated at 25 inches (635 mm).

Association Types

The vegetation of the black oak and Coulter pine forests and woodlands was sampled using the point-centered quarter technique (20 points). The remaining vegetation types are described qualitatively. The black oak savanna and Coulter pine-black oak vegetation are considered together in the survey but separated in the establishment record.

***Arctostaphylos* Chaparral (37520):** 220 acres (89 ha). There are two forms; both occur on the summit on gentle-to-moderate slopes. The first, the mixed *Arctostaphylos* chaparral, occurs on SE.-facing slopes and is dominated by *Arctostaphylos pringlei* var. *drupacea*, *A. glandulosa*, *Adenostoma fasciculatum*, and *Quercus wislizenii* var. *fructescens*. The second is the *Arctostaphylos parryi* var. *drupacea* type. It occurs on NE.-facing slopes on deeper soils than the former type. Both types are apparently successional to black oak woodland and Coulter pine forest. Invading Coulter pines in both types are about 20-30 years old and 20-26 ft (6-8 m) tall. Herb cover is sparse and restricted to small openings between the shrubs.

Coulter Pine-Black Oak Woodland (84140, 71120): 200 acres (81 ha). This association and the related black oak savanna form a complex in the RNA. The Coulter pine forest is the most variable of these two types, with mixed composition pine-oak woodlands prevalent in the SW. part of the RNA and Coulter pine-chaparral more common in the NE. portion. These mixed woodlands consist of various stocking levels of Coulter pine and black oak, from relatively large stands of robust specimens adjacent to grassland to early successional stands invading *Arctostaphylos* chaparral. The largest Coulter pines reach 4 ft (1.2 m) dbh and 75 ft (23 m) tall.

At eight points sampled in the mixed pine-oak phase, Coulter pine is stocked twice as densely as black oak, covers more than twice the basal area of oak, and occurs at all points versus 75 percent of points for black oak.

Mean density of trees throughout the entire complex is 160/ha, with black oak averaging 9.6 m^2/ha and Coulter pine averaging 5.1 m^2/ha basal area (total basal area 14.8 m^2/ha). Coulter pine has seedlings associated with 35 percent, and black oak 15 percent, of the 20 points sampled.

Understory vegetation is made up of scattered shrubs of *Arctostaphylos pringlei* and *A. glandulosa* with many of the herbs and grasses also represented in the herb land-grassland vegetation type. The most common species include *Eriophyllum confertiflorum*, *Bromus carinatus*, *Galium angustifolium*, *Eriogonum wrightii*, *Castilleja martinii*, *Agoseris grandiflora*, *Vicia americana*, and *Koeleria macrantha*. Much of this vegetation in the SW. portion of the RNA appears to have recently invaded the herb land-grassland.

Interior Live Oak (*Quercus wislizenii*) Chaparral (37A00, 71150, 81330): 190 acres (77 ha). This type is divided in the ecological survey into woodland chaparral and escarpment chaparral, but it is merged, following Holland's system in the establishment record. On steep, rocky NE.-facing slopes, it is the most

mesic of the local chaparrals, verging on a woodland or forest with some individual interior live oak and canyon live oak (*Quercus chrysolepis*) up to 16 ft (5 m) tall and 6 inches (15 cm) dbh. However, in most areas the oaks are shrubby. The relatively mesic and diverse understory consists of *Cercocarpus betuloides*, *Ceanothus integerrimus*, *Garrya veatchii*, *Fraxinus dipetala*, *Solanum xantii*, *Polystichum munitum*, *Dryopteris arguta*, *Monardella macrantha*, *Melica imperfecta*, and *Tauschia arguta*.

In contrast, the escarpment phase is the most open form of chaparral locally, with only scattered *Q. wislizenii* var. *fructescens*, shrubby canyon live oaks, and several understory plants characteristic of rock outcrops. These include *Mimulus longiflorus*, *Zauschneria californica* ssp. *latifolia*, *Haplopappus squarrosus*, *Lotus argophyllus*, *Eriogonum saxatile*, *E. davidsonii*, *Poa nevadensis*, and *Selaginella asprella*.

Scrub Oak Chaparral (37900, 37110): 150 acres (61 ha). This is a diverse chaparral consisting of dense shrubs 6.5-13 ft (2-4 m) in height. It occurs on relatively open N.-facing exposures. Scrub oak (*Quercus dumosa*) dominates marginally over other shrubs including *Cercocarpus betuloides*, *Adenostoma sparsifolium*, *A. fasciculatum*, *Arctostaphylos glandulosa*, *Fraxinus dipetala*, *Quercus wislizenii* var. *fructescens*, *Keckiella antirrhinoides*, *Rhamnusi licifolia*, *Ribes malvaceum*, *Ceanothus cuneatus*, and *Haplopappus squarrosus* ssp. *grindeloides*.

Herb Land-Sage Vegetation (32500, 35210, 35400, 42110, 42200): 51 acres (21 ha). This association is divided into four subtypes. Although all have different dominants, there are a number of shared subdominants, and the environmental characteristics of all subtypes are similar. They are described below:

Artemisia tridentata dominates the *Artemisia* herb land. It is restricted to a small 4-acre (1.6-ha) area on deep granitic soil with a gentle, mostly S.-facing aspect. The main body is dense sagebrush with few understory species, but marginal areas support a diversity of herbs and subshrubs (23 species listed), including *Vicia americana*, *Linanthus lemmonii*, *Lupinus excubitus* var. *austromon-tanus*, *Eriogonum wrightii*, *Eriophyllum confertiflorum*, *Frasera parryi*, and *Solidago californica*. This vegetation appears stable, with little change from aerial photos taken in the 1940s.

Figure 29—Cahuilla Mountain, large southeast-facing open herbland with black oak savanna on crest of hill. (1985)

Open herb land occurs adjacent to *Artemisia* herb land and in several other patches on W.- and SW.-facing slopes. All of the species associated with the *Artemisia tridentata* subtype also occur along with a number of others, including *Microseris linearilobа*, *Lotus strigosus*, *Camissonia bistorta*, *Lupinus bicolor*, *Penstemon centranthifolius*, *Eriastrum filifolium*, *Phacelia distans*, *Arabis sparsiflora* var. *californica*, and *Gilia capitata*. Grasses are uncommon in this subtype.

Salvia herb land is dominated by *Salvia apiana*. This subtype occurs in patches bordering open herb land and chaparral, on soils shallower than the open herb land but deeper than chaparral. Diversity and density of plants are less than in the previous open herb land subtype, but included are many of the same subdominants such as *Eriogonum wrightii*, *Galium angustifolium*, and *Penstemon centranthifolius*. The native grasses *Stipa coronata*, *Melica californica*, and *Koeleria macrantha* are conspicuous in some areas. Like the *Artemisia* herb land, this subtype is relatively stable. It is similar to the sage scrub communities described by Holland (1986) and other authors.

The herb land-grass subtype contains a significant mixture of grasses. These species vary from exposed xeric sites (with annual species such as *Bromus tectorum* and *Vulpia megalura*) through open W.-facing slopes with *Elymus condensatus*, *Koeleria macrantha*, *Sitanion longifolium*, and *Melica californica*, to relatively mesic depressions and swales dominated by *Muhlenbergia rigens*.

A rather sparsely vegetated variant, the *Chrysothamnus*-herb land, occurs on loose granitic soil in one area in the W. portion of the RNA. *Chrysothamnus teretifolius* and *Eriogonum wrightii* codominate with scattered *Frasera parryi*, *Penstemon centranthifolius*, *Arenaria douglasii*, *Nemacladus ramosissimus*, *Viola purpurea* ssp. *xerophyta*, *Linanthus ciliatus*, *L. dianthiflorus*, *Trichostema lanceolatum*, and *Cryptantha micrantha*.

Black Oak Savanna (71120, 81340): 41 acres (17 ha). This association is best developed in two patches adjacent to grassland in the NW. portion of the area where a savanna or a forest type may occur. Individual black oaks may be more than 3.3 ft (1 m) dbh (largest 5.3 ft, 1.6 m). The largest individuals are fire scarred. The understory of the oak savanna is dominated by herbs and grasses. This understory is taller and lusher (in spring) than adjacent, open herb land. Dominant species include *Bromus diandrus*, *B. tectorum*, *B. carinatus*, *Collinsia heterophylla*, *Galium aparine*, *Solidago californica*, *Artemisia ludoviciana*, *Montia perfoliata*, *Delphinium parishii*, and *Madia gracilis*. These savannas grade into the Coulter pine-black oak woodland on shallower soils. The few small areas of high-density black oak have dense and mesic understories dominated by such species as *Symphoricarpos mollis* and *Thalictrum fendleri*.

One small seep (Holland 45400) is associated with a dense black oak forest. It has several hydrophilic herbs including *Aquilegia formosa*, *Juncus textilis*, *Carex fracta*, and *Stachys rigida*.

Chamise Chaparral (37200): 31 acres (13 ha). This association occupies the steep, xeric, S.-facing slopes at the lowest elevations. It is dominated by *Adenostoma fasciculatum*, which often occurs in nearly pure stands. Other associated species are few and include *Yucca whipplei*, *Lotus scoparius*, and *Penstemon centranthifolius*. It is a low, dense chaparral with a very sparse understory.

Plant Diversity

One hundred fifty-eight taxa are listed in the establishment record.

Conflicting Impacts

The area will likely require prescribed burning to maintain the mixture of chaparral, Coulter pine, and black oak vegetation. The area receives moderate recreational use (principally day hiking), but there is little visible impact.