

36. Hall Canyon (Keeler-Wolf 1986e, 1989k)

Location

This established RNA is on the San Bernardino National Forest, Riverside County. It is about 5.3 miles (8.5 km) NW. of Idyllwild and lies in portions of sects. 15, 16, 21, and 22 T4S, R2E SBBM (33°48'N., 116°46'W.), USGS Lake Fulmor quad (fig. 74). Ecological subsection – San Jacinto Mountains (M262Bm).

Target Element

Mixed Conifer Forest

Distinctive Features

Research Precedent: The RNA lies adjacent to the small but heavily used James Reserve, managed by the University of California, Riverside. This scientific reserve, part of the University of California Natural Lands Reserve System, has been in operation since 1966. A large number of research projects have taken place at least partially within the RNA. Virtually all of the visitors to the James Reserve (well over 1800 user-days annually) have made some use of the RNA for research, field trips, or casual observation. No other RNA in California except the Harvey Monroe Hall has such a precedent of research use. Because of the excellent facilities (e.g., electricity, herbarium, refrigeration, computer access, etc.) at the James Reserve, there is great potential for further research. A remote sensing station was installed at the Black Mountain Lookout in 1987 by James Reserve to monitor many points within the RNA for phenological and successional change.

Mixed Conifer Forest: This is the only surveyed RNA representing the mixed conifer forest in S. California. A large elevation span assures the representation of a broad zone of mixed conifer and associated vegetation types from the chaparral to the upper elevation mixed conifer forest. The area is representative of much of the mixed conifer forest of the Southern California Mountains and Valleys ecological section (Peninsular Ranges).

Fire History: The fire history over the RNA varies and is indicative of the effects of fire and its importance in shaping the various plant associations in the area. Most of the area of mid- and upper-slopes below about 6500 ft (1981 m) was burned in an extensive fire that occurred in approximately 1880. Most stems of conifers and re-sprouts of canyon live oak are younger than 108 years. The only survivors of the fire are in rocky areas or in the canyon bottom incense-cedar (*Libocedrus decurrens*) forest. At upper elevations, fire intensity has been lower, with many survivor stems of sugar pine (*Pinus lambertiana*) and white fir (*Abies concolor*). The 1974 fire did not burn extensively into the upper elevation mixed conifer forest, probably largely as a result of the open nature of this forest dictated by the numerous rock outcrops.

Rare Plants: One species, *Lilium parryi*, is a member of CNPS List 4. It is a characteristic component of the riparian scrub along Indian Creek.

Physical Characteristics

The area covers approximately 667 acres (270 ha) on the W. slopes of the San Jacinto Mountains. The RNA occupies the upper reaches of a SW.- trending drainage (Indian Creek) heading at Black Mountain (7772 ft, 2369 m) and stretches to within 650 ft (200 m) of the small reservoir known as Lake Fulmor (5380 ft, 1640 m), with an elevation range of 2392 ft (729 m). SW.-facing slopes predominate with some S.-

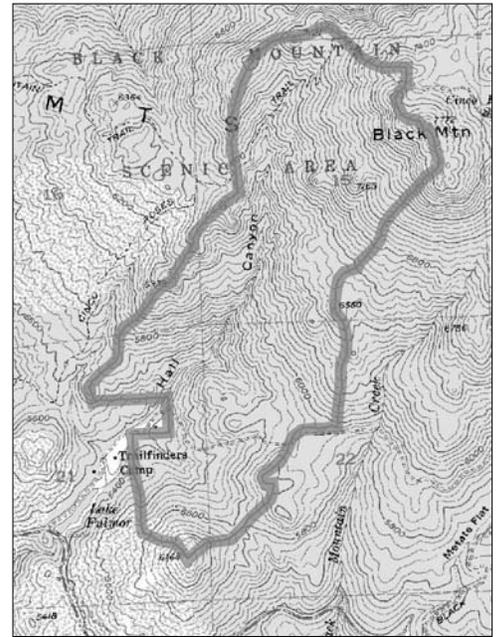


Figure 74—Hall Canyon RNA



Figure 75—Hall Canyon, sugar pine-white fir forest on west-facing upper slopes of Black Mountain. (1985)

, W.-, N.-, SE.-, and E.-facing exposures. Slopes are steepest at the upper elevations and gentlest along two bench systems at the middle elevations.

Rocks are entirely late Cretaceous granitics from the San Jacinto Pluton. Numerous outcrops occur, particularly at the upper elevations. Soils have been mapped as five units. These are Wapi-Pacifico families/rock outcrop complex 50-75 percent slopes, Pacifico-Wapi families complex 30-50 percent slopes, Pacifico-Preston families complex 30-50 percent slopes, Green Bluff-Brader families association 15-50 percent slopes, and rock outcrop areas.

Only the Green Bluff-Brader, which occurs in the flatter valley bottom areas, has relatively deep, sandy loam soil; the other types are typically shallow and rocky. The 50-year-average annual precipitation at Idyllwild at 5397 ft (1645 m) is 25.3 inches (643 mm) although the estimated annual average atop Black Mountain is 40 inches (1020 mm). Snow depth averages 10-25 inches (25-64 cm) on April 1 at the upper elevations. The mean annual temperature at Idyllwild is about 53 °F (11.7 °C).

Association Types

Ten 100-m² plots were sampled on the white fir-sugar pine (*Abies concolor*-*Pinus lambertiana*) forest, seven in canyon live oak (*Quercus chrysolepis*) forest, ten in ponderosa pine (*Pinus ponderosa*) forest, five in California black oak (*Quercus kelloggii*) forest, and eight in incense-cedar (*Libocedrus decurrens*) canyon bottom forest.

White Fir-Sugar Pine Forest (84230, 85320): 245 acres (99 ha). This association is included under mixed conifer forest in the establishment record. It contains the most characteristic form of the mixed conifer series in the RNA. Canyon live oak is not as important a species as in lower-elevation forests (occurring only on xeric exposures), and the forest is clearly dominated by conifers. Typically, sugar pine dominates (*fig. 75*) on W.- and SW.-facing slopes at the upper elevations (> 6700 ft, 2042 m), while white fir dominates on more N.-facing slopes.

This forest is open, averaging 780 trees/ha. A large portion of the ground is covered with massive outcrops, especially on the W.- and SW.-facing slopes. At such exposures sugar pine covers more than twice the basal area of white fir. However, white fir occurs in higher densities than sugar pine in many areas. This is particularly true on the small unburned area of NW. exposure. Here white fir is codominant with sugar pine, Jeffrey pine (*Pinus jeffreyi*), and incense-cedar. On W.- to SW.-facing slopes (where the plots are located) total basal area cover averages 102 m²/ha. Sugar pine comprises 46 percent of the basal area, white fir only 19 percent. However, white fir averages 41 percent relative density, whereas sugar pine averages only 14 percent. Typical dominant sugar pines are relatively slow growing, between 330 and 400 years, and 24-30 inches (61-76 cm) dbh. The largest trees in the sample area are about 46 inches (117 cm) dbh and may be 600 years old. The understory is sparse, with occasional patches of *Chrysolepis sempervirens* at the upper elevations.

Canyon Live Oak Forest (81320, 84140): 218 acres (88 ha). Canyon live oak is the most numerous tree in the RNA. There is a broad zone in the middle elevations of the area where this species is dominant in cover and density. Typically,

Coulter pine (*Pinus coulteri*) and sugar pine tower over the smaller oaks in a scattered, open canopy. Exposure is generally W. to SW.; slopes are steep. Understory is rocky and, virtually, without herb cover.

Most canyon live oak stems are resprouts (often 8-10 per clump) resulting from widespread fire about 1885. Stems of the oaks average <20 inches (51 cm) dbh and 40 ft (12 m) tall. Stem density is relatively high (1620/ha) with basal area cover averaging 85 m²/ha. Canyon live oaks make up 56 percent of the stems and 42 percent of the basal area. Other species, in descending importance, include sugar pine, Coulter pine, *Quercus x morehus*, *Arctostaphylos pringlei* var. *drupacea* (tree size), white fir, and interior live oak (*Quercus wislizenii*). Herbs and shrubs are sparse, except at lower elevations where *Rhamnus californica* may be common.

Ponderosa Pine Forest (84210): 93 acres (38 ha). This forest occurs at elevations below 6000 ft (1829 m). It dominates on deep alluvial soils of the valley bottom and also on N.- and NW.-facing slopes. It co-occurs with Coulter pine, sugar pine, white fir, incense-cedar, California black oak, and canyon live oak. Basal dominance by ponderosa pine is more than 2 times greater than any other species (24 m²/ha), with total basal area cover averaging 65 m²/ha. Tree densities average 1140/ha. Canyon live oak comprises 46 percent of the stems. The understory is sparse with much duff. Three shrub and 19 herb species are listed on the sample plots, with *Galium angustifolium* the only species occurring on 50 percent or more of the plots. Trees grow relatively rapidly with ponderosa pine attaining diameters of 30-33 inches (76-84 cm) in slightly over 100 years.

California Black Oak Forest (81340): 60 acres (24 ha). This deciduous forest occupies NW.- to W.-facing slopes between 5500 and 6150 ft (1676-1874 m). It occurs on relatively deep soils. Total basal area cover is 113 m²/ha, with California black oak comprising 57 percent of that value. Total tree density is 980/ha, with black oak relative density 55 percent. Most California black oak are 15-25 inches dbh (38-61 cm), 17-22 m tall, and 70-100 years old. Other subdominants, in order of importance value, include Coulter pine, incense-cedar, Jeffrey pine, sugar pine, and canyon live oak. Shrub and herb cover is relatively high, with average ground cover estimated between 15 and 20 percent, representing 27 species. Among the most typical are *Galium angustifolium*, *Bromus marginatus*, *Bromus orcuttianus*, *Castilleja martinii*, *Thalictrum fendleri*, and *Angelicatomentosa*.

Montane Chaparral (37520, 37530): 44 acres (18 ha). Two types are described: an early successional *Ceanothus* type dominated by either *C. leucodermis*, *C. integerrimus*, or hybrids between the two, covering 34 acres (14 ha); and a more persistent manzanita type dominated by *Arctostaphylos glandulosa* or *A. pringlei* var. *drupacea*, covering 10 acres (4 ha). *Ceanothus* chaparral is most extensive where the 1974 fire occurred on the NW. side of the RNA. Manzanita chaparral occurs in small isolated remnant patches that may have resulted from fires more than 100 years ago. The understory of both types is typically sparse.

Incense-Cedar Canyon Bottom Forest (84230, 63500): 7+ acres (3 ha). This association is included in the discussions in the establishment record of mixed conifer forest and montane riparian scrub. Incense-cedar dominates in a narrow zone along the banks of Indian Creek near permanent moisture. Before the 1974 fire, incense-cedar dominated this semiriparian strip from the lowest reaches of the RNA up to about 6900 ft (2103 m). At present this type gives way to snags at about 6500 ft (1981 m).

Sample plots indicate a density of 1600 trees/ha and a total cover of 205 m²/ha. Incense-cedar comprises 23 percent relative density and 63 percent relative cover. Other trees, in descending order of importance value, include white fir, canyon live oak, sugar pine, ponderosa pine, California bay

(*Umbellularia californica*), Coulter pine, and black oak. The age of some of the incense-cedars is estimated at more than 500 years, and several measured more than 60 inches (1.52 m) dbh. The valley bottom location is relatively well-protected from fire. The dense forest tends to suffer major canopy damage if burned.

Herbs and shrubs are typically riparian hydrophilic species and may cover more than 50 percent in small, sunny creekside openings. They include *Rhododendron occidentale*, *Euonymus occidentalis*, *Ribes nevadense*, *Pteridium aquilinum*, *Chimaphila menziesii*, *Woodwardia fimbriata*, and *Lilium parryi*. A similar group of species is associated with several seeps (Holland 45400) scattered throughout the area.

Plant Diversity

Two hundred forty-five taxa of vascular plants have been reported from the vicinity of the RNA; however, some are typical of lower elevations (e.g., locally only within the neighboring James Reserve).

Conflicting Impacts

The area is adjacent to the heavily used Lake Fulmor recreational site, although a chain-link fence forming the boundary of the James Reserve effectively prevents casual entry from the SW. A small area of the SE. side of the area was removed from the original RNA proposal because of impact by woodcutting and camping. A small area of the 1974 burn was revegetated with non-native giant sequoia (*Sequoiadendron giganteum*).