

## 2. Agua Tibia (Eagle Crag) (Frazier 1989, Martin 1990a)

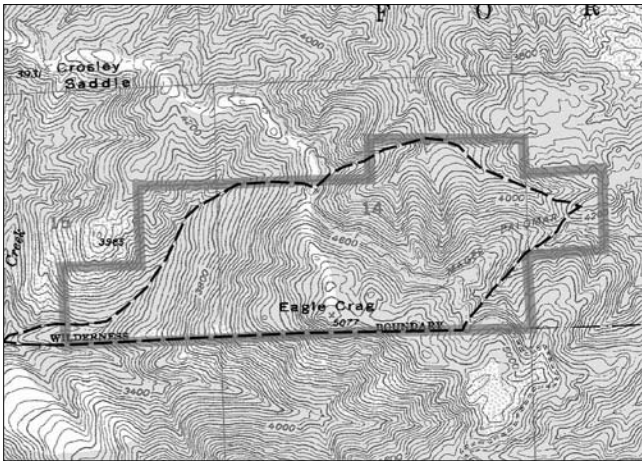


Figure 5—Agua Tibia RNA

Dashed line = Ecological study area  
Solid gray line = RNA Boundary

### Location

This established RNA is on the Cleveland National Forest, Palomar district, in the Agua Tibia Mountains in N. San Diego County. It lies approximately 50 miles (80 km) N. of San Diego and 75 miles (120 km) S. of Los Angeles. The RNA falls entirely within the Agua Tibia Wilderness. The study area is included in portions of sects. 13, 14, and 15 T9S, R1W (33°22'30"N., 116°56'W.), USGS Vail Lake quad (fig. 5). Ecological subsection – Palomar-Cuyamaca Peak (M262Bo).

### Target Elements

Bigcone Douglas-Fir (*Pseudotsuga macrocarpa*) and Canyon Live Oak (*Quercus chrysolepis*)

### Distinctive Features

Fossil evidence for bigcone Douglas-fir dates to the Pliocene, 7 million years ago. It is endemic to S. California and limited in its range, currently from the Mount Pinos region of Kern County to Chariot Canyon, S. of Banner, San Diego County. The population within the RNA is of interest for its great age, size, purity of stand, remoteness, and proximity to its S. limit. Dense stands are found on steep slopes in association with canyon live oak, comprising a fairly distinct and pure stand of a bigcone Douglas-fir-canyon live oak forest.

Pacific madrone (*Arbutus menziesii*) is common in the Pacific Northwest but quite rare in S. California. The grove within the RNA represents the extreme S. limit for this species; only one other grove, on Rodriguez Mountain (less than 10 miles [16 km] to the S. of this grove), is known to be farther S. As with the bigcone Douglas-fir, Pacific madrone seems to be limited to mesic sites.

**Rare Plants:** *Monardella macrantha* ssp. *halli* (Hall's *Monardella*) and *Linanthus orcutti* (both CNPS list 1B) are found within the RNA.

**Southern Extents:** *Arbutus menziesii*, *Bromus orcuttianus* var. *halli*, *Lonicera hispidula*, *Chimaphila menziesii*, *Pterispora andromedea*, and *Sedum spathulifolium* are all at the S. limits of their ranges within the RNA.

**Introduced Species:** Only two introduced plant species are known to occur within the RNA: *Bromus tectorum* (cheatgrass) and *Vulpia myuros* var. *hirsuta* (foxtail fescue).

**Fire History:** Much of the area within this RNA burned in August 1989. The information presented here is pre-burn data from the ecological survey. Before the fire, the area had not burned in more than 100 years and was noted for the great age of its chaparral. According to Frazier (1989) in a post-fire examination of the area, the fire did not crown the bigcone Douglas-fir, and many of those trees were doing well. However, the fire did kill most of the seedlings and saplings of both bigcone Douglas-fir and canyon live oak.

### Physical Characteristics

The established RNA covers 480 acres (194 ha) between 3240 and 5077 ft (1311-1547 m). The study area covers 471 acres (191 ha) between 3000 and 5077 ft (900-1550 m). The highest point of the Agua Tibia mountains, Eagle Crag, is included in the RNA (fig. 6). The Agua Tibia Range divide passes through this

crag, separating the RNA into a less eroded, W.-facing slope and a N.-facing slope cut by several minor drainages. The area surrounding the crag itself is a gently sloping saddle, with an average grade of 30 percent. Areas below the saddle have a slope of 60-70 percent.

The geology is dominated by the Peninsular Ranges batholith, a large body of intrusive, igneous rock. Granodiorite and quartz diorite are the most prevalent components of the batholith and form the majority of the foundations of the RNA. The two major soil series are formed from weathered granodiorite. On the W. side of Eagle Crag, the predominant soil type is of the Tollhouse series which is rocky, coarse, sandy loam. The soil layer is fairly shallow (5-20 inches [13-51 cm] over hard rock), and has 25 percent boulder and 10 percent rock outcroppings. Soils of the Crouch series predominates on the E. side. The slope is steeper, and soil is deeper and more acidic than that of the Tollhouse series. Boulder and rock outcroppings make up the same percentage as they do in the Tollhouse series. Both of these soil types have rapid to very rapid runoff and high erosion hazard. In some areas, slides have eroded large chunks of the trail to the basin below.

Temperatures are moderate, with rain falling mostly in winter. Rainfall varies greatly from year to year, and at the time of the ecological survey, the area was in the third year of a drought. Average yearly precipitation is 23 inches (585 mm) with 20 inches (510 mm) of snow at the saddle and 4 inches (100 mm) of snow at lower elevations. Many drainages exist within the RNA, but none hold water year-round. By mid-August, only a few pools of standing water remain.

### Association Types

**Bigcone Douglas-Fir-Canyon Live Oak (84150):** In general, the E. portion of the RNA is dominated by two patches of bigcone Douglas-fir and canyon live oak. They cover a combined area of 192 acres (78 ha) and make up 40 percent of the total area of the RNA. Lower-elevation populations of bigcone Douglas-fir are somewhat disjunct, but those above 1300 m are contiguous, sometimes covering entire slopes. The best development of bigcone Douglas-fir is on the N.-facing slopes. Some trees were estimated to be 500-600 years old. Bigcone Douglas-fir has approximately 8 times the basal area/ha of canyon live oak. Approximately equal numbers of mature trees of both species occur in the stands, but there are 20 times more canyon live oak seedlings than bigcone Douglas-fir seedlings.

Understory shrub/herb cover is sparse (less than 7 percent). It is composed of the following species: *Chimaphila menziesii*, *Erigeron foliosus*, *Hieracium albiflora*, *Linanthus floribundus*, *Monardella macrantha*, *Osmorhiza chilensis*, *Silene lemmonii*, *Sedum spathulifolium*, *Toxicodendron diversilobum*, *Carex* sp., *Polystichum munitum*, and *Dryopteris arguta*. In occasional open areas, small patches of eastwood manzanita (*Arctostaphylos glandulosa*) and chaparral whitethorn (*Ceanothus leucodermis*) occur.

**Montane Manzanita Chaparral (37520):** 142 acres (57 ha). This association occurs on the SW.-facing slope through which the Magee Palomar Trail passes. The area extends upslope to 5000 ft (1540 m) where it continues along the windswept crest of the Agua Tibia divide. Coulter pines (*Pinus*



**Figure 6—Agua Tibia, view north-west toward Eagle Crag. (around 1988/89)**

*coulteri*) line the border between this patch and the bigcone Douglas-fir patch and are found scattered within the chaparral, although their numbers are decreasing due to infestation by bark beetles. Chaparral whitethorn and canyon live oak are scattered throughout the chaparral, but canyon live oak is found in higher numbers near the edges. The vegetation is composed mostly of eastwood manzanita. Other species include pink-bracted manzanita (*Arctostaphylos pringlei* ssp. *drupacea*), interior live oak (*Quercus wislizenii*), and chamise (*Adenostoma fasciculatum*).

**Canyon Live Oak (81320):** 146 acres (59 ha). This association occurs on the W. half of the RNA where there is a broad slope dropping more than 2000 ft (600 m). Canyon live oak is plentiful and found in monospecific stands which range in size from 0.2 acre (0.1 ha) to more than 25 acres (10 ha). Oak is most prevalent on N. aspects and is replaced by manzanita and *Ceanothus* on S. aspects. The vegetation is very dense with complete canopy closure.

**Riparian Vegetation (61310):** Not mappable. This association type occurs along the major drainages in the RNA. Cover varies greatly between drainages, ranging from quite open areas to impenetrable thickets. This vegetation type is significantly different from that of adjoining slopes. Tree species found here include incense-cedar (*Libocedrus decurrens*), box elder (*Acer negundo*), coast live oak (*Quercus agrifolia*), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), and California sycamore (*Platanus racemosa*). Dominant understory species include *Rubus ursinus*, *Ribes nevadense*, *Ribes amarum*, *Toxicodendron diversilobum*, *Rhododendron occidentale*, *Urtica dioica* ssp. *holosericea*, and *Epilobium canum*.

**Madrone-Canyon Live Oak (no Holland equivalent):** Unmappable. A small population of Pacific madrone is found in the lowest, westernmost part of the RNA, along the Agua Tibia Creek drainage below the canyon live oak forest. Pacific madrone occurs in clumps of individuals, each with several stems coming off the same root crown (indicative of the fire that occurred 100 years ago). Seedlings, saplings, and mature individuals were all observed, indicating that normal regeneration of the species is occurring. While the occurrence of Pacific madrone is significant, canyon live oak dominates the stand and attains larger sizes than on the slope above (some are as tall as 60 ft [18 m] and are up to 26 inches [65 cm] in dbh). Other species of trees found here are coast live oak and California sycamore. The understory is open and contains *Ceanothus oliganthus*, *Styrax officinalis*, *Toxicodendron diversilobum*, *Ribes amarum*, *Ribes nevadense*, *Rubus parviflorus*, *Rubus ursinus*, *Lilium ocellatum*, and *Keckiella cordifolia*.

### **Plant Diversity**

One hundred nine species of vascular plants are listed.

### **Conflicting Impacts**

In efforts to stop the spread of the fire in August 1989, diamonium phosphate fire retardant was dumped on much of the area, particularly the chaparral. The small population of *Linanthus orcutti* near the Magee Palomar Trail was plowed under when the trail was widened into a fire road. However, in the sections affected by the fire, the RNA may serve as an important biological study area for comparing burned and unburned areas and post-fire regeneration.