

49. King Creek (Reveal 1978; Keeler-Wolf 1990a, 1991e)

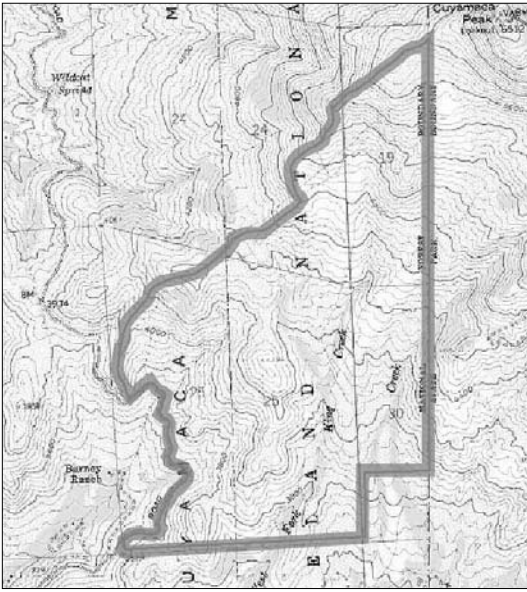


Figure 100—King Creek RNA

Location

This established RNA is on the Cleveland National Forest. It lies about 23 miles (37 km) NE. of El Cajon and occupies portions of sects. 24 and 25 T14S, R3E and sects. 19 and 30 T14S, R4E SBBM (32°56'N., 116°28'W.), USGS Cuyamaca Peak and Tule Springs quads (*fig. 100*). Ecological subsections – Palomar-Cuyamaca Peak (M262Bo) and Western Granitic Foothills (M262Bn).

Target Element

Cuyamaca Cypress (*Cupressus arizonica* var. *stephensonii*)

Distinctive Features

Cuyamaca Cypress: The 50-acre (20-ha) Cuyamaca cypress stands in King Creek drainage are the only naturally occurring Cuyamaca cypress in the world. All cypress stands are on the SW. slopes of Cuyamaca Peak. Cuyamaca Cypress is the rarest cypress in California. Thirty-five acres (14 ha) of the Cuyamaca cypress are included in the RNA. The remaining 15 acres (6 ha) are in the Cuyamaca Rancho State Park adjacent to the RNA. All stands experienced fire in 1950 and one stand was burned again in 1970. The 1970 fire reduced the then 20-year-old stand by about 75 percent because of premature burning (before adequate numbers of cones could be produced).

Frequent fire is a great threat to the Cuyamaca cypress. Although the tree needs fire to open the serotinous cones, fire cannot occur too early in the plant's life or the net result will be a decrease in population (see Guatay Mountain, #34).

Due to its geographic isolation and small population, Cuyamaca cypress is genetically distinct from other cypress in western N. America and lacks genetic diversity. The taxonomy and regeneration strategy of Cuyamaca cypress are discussed extensively in Reveal's (1978) report.

Rare Plants: The Cuyamaca cypress is a CNPS List 1B species. *Calamagrostis densa*, *Diplacus (Minulus) clevelandii*, lemon lily (*Lilium parryi*), and Engelmann oak (*Quercus engelmannii*) are members of CNPS List 4. *Calochortus dunnii* and *Brodiaea orcuttii* are CNPS List 1B species. In addition, two CNPS List 1B species, *Delphinium hesperium* ssp. *cuyamaca* and *Horkelia truncate*, are present in the vicinity of the RNA.

Disjunct Populations: Several mountain species occur in the RNA far from their next nearest occurrences in the Peninsular Ranges. These species include *Salvia sonomensis*, *Viola lobata*, *Ceanothus foliosus*, *Euphorbia palmeri*, *Lilium pardalinum*, *Phlox austromontana*, sugar pine (*Pinus lambertiana*), white fir (*Abies concolor*), and incense-cedar (*Libocedrus decurrens*).

Rare Fauna: Four California State species of special concern have been sighted in the RNA; they are Cooper's hawk (*Accipiter cooperi*), golden eagle (*Aquila chrysaetos*), San Diego horned lizard (*Phrynosoma coronatum blainvillei*), and San Diego mountain kingsnake (*Lampropeltis zonata pulchra*).

Physical Characteristics

The established RNA covers 1002 acres (406 ha). Elevations range from 3630 to 5800 ft (1106-1768 m). The area occupies the SW.-facing slope of Cuyamaca Peak (6512 ft, 1985 m elevation). The bulk of the cypress lines intermittent-to-dry upper drainages of the W. and the main forks of King Creek, which flow to the SW. and converge outside the area.

Geologically the area is divided at about the 4000-ft (1219-m) contour into an upper elevation area of Cuyamaca Gabbro and a lower elevation zone of Bonsal Tonalite (granitic). On the gabbro substrate two soil series occur, the Las Posas and the Cohasset. The cypress trees are restricted entirely to the Las Posas soil, which occurs around the base of the mountain. Las Posas soil is deep, reddish-brown, stony loam that retains water well. This quality has doubtless influenced the ability of cypress to survive continual drying of the environment since the Pleistocene. Annual precipitation averages 30-35 inches (750-900 mm), with 80 percent falling between December and May. Snow falls regularly at the upper elevations, but it melts quickly. Yearly minimum temperatures average 22 °F (-12 °C); maximum temperatures average 95 °F (35 °C).

Association Types

Reveal (1978) briefly delineated the area into five vegetation types: cypress vegetation, riparian vegetation, chamise-manzanita-ceanothus chaparral, chamise-ceanothus-scrub oak chaparral, and dry meadow. Keeler-Wolf (1990a) further mapped the area into the following 11 types.²

Diegan Sage Scrub (32500): 61 acres (25 ha). This type occurs on shallow, excessively well-drained soils on S. exposures both on granitic and gabbroic soil. On gabbroic soil this type usually occurs sporadically, as small patches of less than 1 acre (0.4 ha). Diegan sage scrub frequently forms a border around the meadows along the W. Fork of King Creek. Dominant species include white sage (*Salvia apiana*), *Eriogonum fasciculatum*, *Yucca whipplei*, *Gutierrezia californica*, *Penstemon centranthifolius*, *Lupinus* sp., and *Clarkia* sp.

Mafic Southern Mixed Chaparral (37122): 491 acres (199 ha). This is an open, low (2.5-3 ft, 0.8-0.9 m) chaparral dominated by Eastwood manzanita (*Arctostaphylos glandulosa* ssp. *glandulosa*) and chamise (*Adenostoma fasciculatum*). It occupies relatively xeric exposures on S., W., or E. aspects on gabbro soil. The two dominants are augmented with a number of other shrubs including *Ceanothus greggii* ssp. *perplexans*, holly-leaf red berry (*Rhamnus ilicifolia*), Cleveland's sage (*Salvia clevelandii*), *Ceanothus oliganthus*, and toyon (*Heteromeles arbutifolia*). Prostrate or creeping sage (*Salvia sonomensis*) dominates in the openings and semi-shaded areas beneath the shrubs. Other major understory species are *Calamagrostis densa*, *Calochortus* sp. (probably mostly *C. dunni*), *Allium campanulatum*, *Sanicula tuberosa*, *Lomatium dasycarpum*, *Pellaea mucronata*, and *Yucca whipplei*. Six 200-m² plots were sampled in this type.

Scrub Oak Chaparral (37900): 229 acres (93 ha). This is a relatively mesic chaparral occurring on N. aspects and slopes surrounding ravine bottoms on both gabbroic and granitic soils. It is made up of dense, tall shrubs, with average heights of 6-10 ft (2-3 m). In addition to scrub oak, other large shrub species such as *Ceanothus leucodermis*, *Cercocarpus betuloides*, *Rhus ovata*, *Arctostaphylos pungens*, and *Ribes indecorum* add to the diversity of the vegetation. Chamise and Eastwood manzanita are common and may codominate with scrub oak on W. and E. exposures on gabbro soil. Hybrid Engelmann and scrub oaks may comprise up to 10 percent cover in some areas. Several woody climbing or sprawling species such as *Galium angustifolium*, *Clematis lasiantha*, *Marah macrocarpus*, *Toxicodendron diversilobum*, and *Lonicera subspicata* are present. Due to the tall and dense canopy, understory cover is poor. A grayish green foliose lichen (*Xanthoparmelia* sp.) makes up 10-15 percent of the ground cover on steep, rocky NW.-facing slopes on gabbro soil. Species composition on gabbro is different from that on granitic soil. On gabbro soil, scrub oak, chamise, and Eastwood manzanita codominate, all averaging about 15-20 percent cover; on granitic substrate, scrub oak dominates (averaging 40 percent on two plots) with relatively low densities of Eastwood manzanita and chamise. Associated species

found on gabbro soils are *Ceanothus greggii* ssp. *perplexans*, *Salvia sonomensis*, and *Calamagrostis densa*, whereas *Ceanothus leucodermis*, *Solidago californica*, and *Stipa* sp. are found on granitic soils.

Valley Needlegrass Grassland (42110): 25 acres (10 ha). This type is limited to five or six small patches. Variation among patches is high, caused by differences in substrate, soil moisture, elevation, slope, and degree of disturbance. Important species are deergrass (*Muhlenbergia rigens*), *Bromus breviaristis*, *Koeleria macrantha*, *Stipa* sp., *Juncus macrophyllus*, and *Sitanion hystrix*. Other species found in this grassland are: *Linanthus dianthiflorus*, *Sanicula bipinnatifida*, *Trifolium depauperiatum*, *Sisyrinchium bellum*, *Gilia capitata*, *G. australis*, *Plantago erecta*, *Orthocarpus purpurascens*, *Layia* sp., and *Hemizonia fasciculata*. Number of weedy species appears to increase with decreasing elevation. Species such as *Erodium cicutarium*, *E. botrys*, *Hypochoeris glabra*, *Bromus rubens*, *B. diandrus*, *B. mollis*, and *Medicago polymorpha* appear more common in the lower W. Fork grasslands near the edge of the private land. The degree of disturbance may also be higher in these low-elevation areas. Seven 1-m² plots were sampled, and 32 species were recorded in this vegetation type.



Figure 101—King Creek, one of the large old Cuyamaca cypress growing along the West Fork within a foot of the stream channel in King Creek RNA. Basal diameter is about 28 inches (11 cm). (1990)

Freshwater Seep (45400): 1 acre (0.4 ha). This type is restricted to one major springy area in the SE 1/4 sec 24 T14S, R3E. The vegetation is dominated by tall herbaceous species and includes *Carex spissa*, *Cyperus parishii*, *Typha latifolia*, *Oenothera elata* ssp. *hirsutissima*, *Hypericum formosus* ssp. *scouleri*, *Lotus oblongifolius*, *Lythrum californicum*, and *Solidago confinis*. Surrounding vegetation is transitional oak woodland with canyon live oak, coast live oak, and scrub oak as dominants.

Southern Coast Live Oak Riparian Forest (61310): 22 acres (9 ha). This forest occurs in intermittent strips surrounding the mesic bottomland adjacent to the W. Fork of King Creek. Individual coast live oaks attain 4 ft (1.2 m) dbh and spread crowns up to 60 ft (18 m) across. Other tree species found in this forest type are: Coulter pine, incense-cedar, bigleaf maple, California black oak, and Engelmann oak. Understory vegetation is dominated by *Symphoricarpos mollis*, *Mahonia dictyota*, poison oak (*Toxicodendron diversilobum*), *Sanicula graveolens*, *Galium aparine*, *Viola purpurea*, and *Elymus glaucus*. Four 10- by 10-m plots were sampled. The average density of coast live oak is 293 trees/acre (725 trees/ha), and the average basal area cover is 355 ft²/acre (82 m²/ha).

White Alder Riparian Forest (61510): 2 acres (0.8 ha). This forest forms an intermittent cover surrounding the small stretches of permanently moist areas along the main and W. forks of King Creek. It is dominated by white alder, which may reach diameters of 24 inches (61 cm) and heights of 60 ft (18m). Also occurring are scattered individuals of California sycamore and the willows *Salix laevigata* and *S. lasiolepis*. A number of hydrophilic species occur in the understory, which includes *Lilium parryi*, *L. pardalinum*, *Rosa californica*, *Carex spissa*, *Potentilla glandulosa*, *Erigeron philadelphicus*, *Mentha spicata*, *Aquilegia formosa*, *Thalictrum fendleri*, and *Woodwardia fimbriata*.

Open Engelmann Oak Woodland (711810): 5 acres (2 ha). This type is limited to the lower W. Fork drainage where it occurs primarily on E. and SE.-facing slopes. It is a woodland codominated by Engelmann oak, coast live oak, and scrub oak. Dominant trees are small (15-20 ft, 4.5-6 m tall) and spindly. Soil is shallow, derived from granite. Associated species are a mixture of Diegan sage scrub (*Salvia apiana* and *Eriogonum fasciculatum*) and scrub oak chaparral (*Quercus dumosa*, *Rhus ovata*, *Ceanothus leucodermis*, chamise, and poison oak).

Canyon Live Oak Forest (81320): 52 acres (21 ha). This type is restricted to the higher elevations of the RNA above 4800 ft (1463 m). It occurs as a scrubby forest of varying density on steep to gentle slopes. The entire type was burned both in 1950 and 1970. Commonly associated woody species are *Rhamnus californica* ssp. *tomentosa*, Coulter pine, *Ceanothus leucodermis*, *Ceanothus palmeri*, *Mahonia dictyota*, and scrub interior live oak (*Quercus wislizenii* var. *fructescens*). Understory species include *Solidago californica*, *Bromus* sp. (perennial native), *Galium andrewsii*, and *Monardella* sp.

Southern Interior Cypress Forest (83330): 34 acres (14 ha). This is the generic name of the forest locally dominated by Cuyamaca cypress. Principal associates of Cuyamaca cypress include *Ceanothus greggii* ssp. *perplexans*, scrub oak, toyon, and *Salvia sonomensis*.

This forest type has high degree of variability. The most extensive, pure form of this type occurs within a matrix of southern mafic mixed chaparral. Eastwood manzanita and chamise are the typical subdominants of the cypress forest. Cuyamaca cypress also occurs as riparian gallery stands adjacent to coast live oak of white alder riparian vegetation. Understory species of the cypress stands in chaparral include many of the same species found in mafic mixed chaparral. Species associated with the cypress stands in riparian areas are shared with the white alder riparian type.

The largest cypress individuals occur in the mesic-to-hydric riparian areas along the upper reaches of the W. Fork of King Creek. Several trees are about 40 ft (12 m) tall and 28 inches (71 cm) in diameter (fig. 101). The densest stand occurs within mesic microsites surrounded by chaparral, as in small rills and on NW.-facing aspects. These densely packed individuals average between 6 and 10 ft (2-3 m) tall and 2-3 inches (5-8 cm) in diameter. Cypress densities in chaparral average 1700-2630 trees/acre (4200-6500 trees/ha), while stream-side stands average 304 trees/acre (750 trees/ha). One particularly noteworthy species in the stands on NW. exposures is the orchid *Habenaria elegans*.

The rare *Brodiaea orcuttii* (CNPS List 1B) is known from cypress stands.

Coulter Pine Forest (84140): 80 acres (32 ha). Coulter pine stands scatter between 4000 and 5800 ft (1219-1768 m), among a matrix of mafic chaparral, scrub oak chaparral, and canyon live oak forest. The stands, occurring on various soil types and having different fire regimes, are very diverse. Low-elevation stands have trees up to 80 years old, 2 ft (61 cm) dbh, and 60 ft (18 m) tall. High-elevation stands, occurring on rocky soils and having burnt in 1970, are open, with small and slow-growing trees; most are less than 20 years old averaging 15 ft (5m) tall. Some stands are dense, with trees about 29 years old, 8-11 inches (20-28 cm) dbh, and 25 ft (7.6 m) tall. Associated and understory species vary, depending upon stand structure and location. Low-elevation stands have understory species such as Eastwood manzanita, chamise, *Ceanothus greggii* ssp. *perplexans*, *Calamagrostis densa*, *Salvia sonomensis*, and *Yucca whipplei*. At higher elevations, other species such as *Rhamnus californica* ssp. *tomentosus*, *Viola lobata*, and *Ceanothus foliosus* become common constituents. Occasionally, saplings of conifers such as incense-cedar, white fir, and sugar pine are found in high-elevation stands. They are derived from individual mature trees growing on the adjacent N.-facing slopes outside of the RNA.

Plant Diversity

The flora is diverse, with 204 taxa known from the RNA.

Conflicting Impacts

Most of the impacts are associated with fire management and have already been discussed. There may have been some cutting of trees in the past for fence posts and firewood. A dirt road comes close to one stand, and others are reachable by four-wheel-drive tracks. A portion of the Cuyamaca cypress stands lies on the adjacent Rancho Cuyamaca State Park. The RNA and State Park need to manage Cuyamaca cypress cooperatively.