

# Peninsular Juniper Woodland and Scrub

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**VEGETATION ASSOCIATION:** PENINSULAR JUNIPER WOODLAND AND SCRUB

**MAPPED SUBASSOCIATIONS:** None

## DATA CHARACTERIZATION

Peninsular juniper woodland and scrub is perhaps the least studied Habitat within the Plan Area. Species composition and ecological factors affecting this community appear to be distinct from typical transmontane juniper-pinyon communities. The mapping of this community is likely based on occurrence of California juniper, an easily identifiable, unique component of the County's flora. For these reasons, it is likely that the mapping of this community, although it probably accurately represents the distribution of California juniper, it may include distinct communities where species composition and ecological processes more closely match other shrub communities (e.g., coastal sage scrub and chaparral).

## BIOGEOGRAPHY

California juniper (*Juniperus californicus*) ranges from San Francisco to Los Cedros Island off the coast of Baja California, Mexico with occurrences mainly on the eastern slopes of the Central Coast, Transverse and Peninsular Ranges but also a few isolated coastal occurrences and extensions into the foothills of the southern Sierra Nevada (Harvey 1951). Peninsular juniper woodland and scrub is most often found on ridges, slopes, and valleys between 1000 and 2450 m (Sawyer and Keeler-Wolf 1995). In San Diego County, California juniper is mainly isolated to abrupt eastern escarpments and desert foothills with an elevational range from 140 to 550 m (Harvey 1951).

## RANGE AND DISTRIBUTION WITHIN WESTERN RIVERSIDE COUNTY

Harvey (1951) mentions a few isolated occurrences of California juniper near Aguanga, that are 15 miles west of more dense juniper patches in the Terwilliger Valley.

Several populations were mapped in the Plan Area totaling 1,106 acres. A small population occurs in the vicinity of Table Mountain and Tule Spring. A single occurrence is mapped west of Pine Cove, south of Indian Mountain. Other single occurrences are northeast of Squaw Mountain, west of the peak of the Lakeview Mountains, and west of Monument Peak. Scattered populations are mapped in the Gavilan Hills, Gavilan Plateau, north of Estelle



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Mountain and on the south and east sides of Lake Mathews. Boyd (1983) hypothesizes that this desert-like community may have historically been more prevalent in the Gavilan Plateau area.

## VEGETATION CHARACTERISTICS

Peninsular juniper woodland and scrub most commonly occurs on the eastern slopes of the Peninsular Ranges. However in the case of this discussion, the Habitat occurs in several distinct low-lying areas of Western Riverside County. The Habitat account presented below reveals some information regarding this community as it more commonly occurs but also attempts to focus on describing the Habitat as it occurs within the Plan Area.

Four-needle pinyon (*Pinus quadrifolia*), single-leaf pinyon pine (*Pinus monophylla*) and California juniper (*Juniperus californica*) are the canopy species which most commonly occur in southern California, forming a scattered canopy from three to 15 m tall (Sawyer and Keller-Wolf 1995; Holland and Keil 1995). Southern California occurrences of juniper woodlands often grade into Joshua tree woodlands or desert scrub communities (Holland and Keil 1995). Shrub cover within this Habitat type is generally intermittent or open and the ground layer is sparse to grassy (Sawyer and Keller-Wolf 1995). Common species on the lower elevational slopes include Mojave yucca (*Yucca schidigera*) (*Y. baccata*) (Holland and Keil 1995). Higher elevation species include chamise (*Adenostoma fasciculatum*) and desert ceanothus (*Ceanothus greggi* var. *vestitus*) (Holland and Keil 1995). Some other dominant vegetation species include phlox (*Leptodactylon pungens*), desert needlegrass (*Achnatherum speciosum*), matchweed (*Gutierrezia sarothrae*), beargrass (*Nolina parryi*), and shrub live oak (*Quercus turbinella*) (Vasek and Thorne 1977).

Only one study of Peninsular juniper woodland and scrub in Western Riverside County was reviewed for this account. The vegetative information found in that study is presented below. The community structure presented below is thought to generally fit the areas where this Habitat occurs in the Plan Area, however, vegetative composition may vary widely.

On the Gavilan Plateau, California juniper occurs in open stands which represent remnants of more extensive historical stands (Boyd 1983). Where juniper woodland is most prevalent on the plateau, topographic relief is moderate. California juniper is the dominant shrub with other scattered shrubs including California buckwheat (*Eriogonum fasciculatum*), spiny redberry (*Rhamnus crocea*), snake cholla (*Opuntia parryi*), chamise (*Adenostoma fasciculatum*), and Nuttall's scrub oak (*Quercus dumosa*) (Boyd 1983). In open areas, often between junipers and other shrubs, grows a diverse herbaceous understory of native annuals and perennials as well



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as non-native annual grasses (Boyd 1983). Common native wildflowers include goldfields (*Lasthenia californica*), baby blue eyes (*Nemophila menziesii*), angel gilia (*Gilia angelensis*), clarkia (*Clarkia purpurea*), common owl's clover (*Castilleja exerta*), California poppy (*Eschscholzia californica*), cream cups (*Platystemon californicus*), Johnny jump-up (*Viola pedunculata*) and common wild onion (*Allium praecox*). Vegetation composition is somewhat altered in other parts of the Plateau where the juniper woodland community occurs and topographic relief is low. Here few understory shrubs occur, mainly cholla (*Opuntia* spp.) and redberry (*Rhamnus crocea*), and the dominant annual is everlasting nest-straw (*Stylocline gnaphalioides*). Other low, desert-like herbaceous species also may be found in these areas and include everlasting nest-straw (*Stylocline filaginea*), Palmer's grappling-hook (*Harpagonella palmeri*), slender pectocarya (*Pectocarya linearis*), strigose deerweed (*Lotus strigosus*), evening-primrose (*Camissonia* spp.), ground-pink (*Linanthus dianthiflorus*), and spine flower (*Chorizanthe* spp.) (Boyd 1983). Under the canopy of junipers, herbaceous growth includes an entirely separate suite of species, including: minor's lettuce (*Claytonia perfoliata*), bedstraw (*Galium aparine*), and nettle (*Parietaria floridana*). On the margins of junipers occur the following annual species: fiddleneck (*Amsinkia intermedia*), common forget me not (*Cryptantha intermedia*), caterpillar phacelia (*Phacelia cicutaria*), and blue phacelia (*Phacelia distans*).

### PHYSICAL ENVIRONMENT

Peninsular juniper woodland and scrub generally occur on bedrock or alluvium-derived soils (Sawyer and Keller-Wolf 1995). California juniper in San Diego County is seldom found on fine-textured lower Bajada and playa soils (Harvey 1951). California juniper appears restricted to sandy and gravelly soils; it is completely absent from clay soils (Harvey 1951).

Trees in desert woodland Habitats are limited by available moisture and temperature extremes (Holland and Keil 1995). California juniper has been recorded as tolerating temperature extremes from  $-9^{\circ}\text{C}$  to  $38^{\circ}\text{C}$  with mean annual temperatures in San Diego County between  $10^{\circ}\text{C}$  and  $21^{\circ}\text{C}$  (Harvey 1951). California juniper occurrences in San Diego County tend to correspond with areas with a steppe climate; i.e., dry climates which are more humid than deserts (Harvey 1951). The average annual precipitation in these areas is between five and 50 cm (Harvey 1951). California junipers have been observed using lateral roots and are thought to also utilize deep penetrating roots allowing the trees to absorb surface and ground water (Harvey 1951). In more easterly, low-elevation occurrences, nearer to the desert, precipitation is the limiting factor in California juniper growth (Harvey 1951). This is evidenced by the observations of California juniper in this region located on mountain tops and lower down on north-facing slopes where available moisture is greater (Harvey 1951).



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## ECOSYSTEM PROCESSES

Ecosystem processes which have been studied in Peninsular juniper woodland and scrub communities are mainly limited to the ecology of California juniper and its responses to fire. The species' reproductive and growth characteristics help to define its occurrence between chaparral and desert environments.

The reproductive cycle of California juniper extends over four years, from fertilization to germination (Harvey 1951). Birds, such as jays, as well as rodents are responsible for transporting juniper seeds which can survive the digestive tract of most animals (Harvey 1951). California juniper is not known to stump-sprout following a burn or cut (Harvey 1951). The long period necessary for reproduction, combined with the inability to stump-sprout and an intolerance of shade lessens the opportunity for California juniper invasion of typically highly fire-influenced chaparral communities. Where fires occur in existing juniper stands, it is thought that there is a high likelihood of extirpation if shrubs become dense before new junipers can grow. As a result, intense fires may extirpate California juniper stands or leave isolated patches or individuals to remain (Harvey 1951). An example of this is the Monument Peak area of San Diego County, where California juniper was collected in 1924 but has not been subsequently relocated, presumably, due to a 1944 fire (Harvey 1951). Re-colonization of California juniper may require large tracts of connected Habitat where seeds may be transported via animals.

## THREATS

There is evidence which indicates that California juniper is susceptible to extirpation following fires (See Physical Environment discussion above). This is likely to be true if placed under intensive human disturbance as well. In the Mojave Desert, stands of juniper woodland are severely restricted due to systematic removal for agricultural development (Sawyer and Keller-Wolf 1995).

Although true mistletoe (*Phoradendron densum*) occurs commonly with California juniper, it does not appear to be seriously injurious (Harvey 1951). A list of insect pests to California juniper includes: scale (*Aonidia shastae*), flattened mealybug (*Pseudococcus* sp.), dark aphid (*Cinara juniperensis*), Callimomid wasps (*Coleophora cinerella*), beetle (*Paracotalpa puncticollis*), (*Mitoura loki*), and (*Coleophora cinerella*). Of these, only the wasps were found to cause significant damage to trees (Harvey 1951).



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## LITERATURE CITED

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