VEGETATION ASSOCIATION: MIXED EVERGREEN FOREST

MAPPED SUBASSOCIATIONS: None

DATA CHARACTERIZATION

Because of the ambiguity in the definition for mixed evergreen forest, precise descriptions of mixed evergreen forest do not occur in the literature. For that reason, it is difficult to determine the specific vegetative characteristics of the areas mapped as mixed evergreen forest in the San Jacinto Mountains. It is likely that these areas generally contain an odd mixture of broadleaved species with various conifer species, described in other conifer Habitats.

BIOGEOGRAPHY

Again, the literature differs in characterization of mixed evergreen forest range. Some authors separate northern and southern California Habitats while others describe the Habitat to cover much of California and portions of Oregon. Thorne (1976) describes this Habitat as two varieties, a northern and southern. Northern California mixed evergreen forest occurs inland from redwood forest to the Klamath and Coast ranges on more xeric sites (Thorne 1976). Southern mixed evergreen forest occurs in areas where there is a transition between riparian forests and yellow pine (i.e., lower montane coniferous forest). As defined by Barbour and Minnich (2000) the community occurs around the Central Valley between 600 and 1,200 m on the Sierra side and between 300 and 1,500 m on the Coast range side. In the north it reaches through the Klamath mountains into Oregon; in the south it occurs between 1,275 and 1,425 m in the Transverse, Peninsular and Baja ranges (Barbour and Minnich 2000). Holland and Keil (1995) describe the range of mixed evergreen communities to stretch from southern Oregon through the Klamath-Siskiyou Mountains, on the coastal mountains, and into San Diego County.

RANGE AND DISTRIBUTION WITHIN WESTERN RIVERSIDE COUNTY

Occurrences of mixed evergreen forest were mapped west of Lake Hemet in the vicinity of Rouse Ridge, north of Marion Ridge, east of Dark Canyon and south of Black Mountain all within the San Jacinto Mountains. Mixed evergreen forest occupies 7,965 acres of the total Plan Area.

VEGETATION CHARACTERISTICS

Due to the general nature of the Habitat description, the literature concerning the constituent species of mixed evergreen forest is similarly vague. In general, there is overlap with the descriptions of broadleaved upland forest and lower montane coniferous forest. Mixed evergreen forest generally has been used to map vegetation occurring between oak woodlands and montane conifer forests, including the following associations: Coulter pine, big-cone Douglas fir, mixed hardwood, Douglas fir-hardwood, tan oak-madrone, and Santa Lucia fir forests (Barbour and Minnich 2000). Presented below are different interpretations of the Habitat occurrence.

Thorne (1976) and Brown (1982) describe mixed evergreen forest as a Habitat containing a canopy of bigcone Douglas-fir *(Pseudotsuga macrocarpa),* Pacific madrone *(Arbutus menziesii),* incense-cedar *(Calocedrus decurrens),* Coulter pine *(Pinus coulteri),* bigleaf maple *(Acer macrophyllum),* coast live oak (*Quercus agrifolia),* canyon live oak *(Q. chrysolepis),* and California bay *(Umbellularia californica)*. As Munz and Keck (1949) describe this Habitat, it does not occur in southern California. Anderson (1988) describes a montane hardwood-conifer series composed of at least one-third broadleaf trees and one-third conifers. This Habitat probably corresponds to areas mapped as mixed evergreen forest in the Plan Area. In southern California, Anderson (1988) adds black oak *(Quercus kelloggii)* and ponderosa pine *(Pinus ponderosa)* to the species listed above. Coulter pine can become a dominant element in this Habitat type in southern California, sometimes occurring co-dominant with big-cone Douglas-fir (Barbour and Minnich. 2000). This description most likely corresponds to the lower phase of lower montane coniferous forest.

The occurrence of big-cone Douglas-fir is likely to be scattered and similar to its occurrence in broadleaved upland forest. Because an extensive discussion of big-cone Douglas-fir ecology is presented in the broadleaved upland forest Habitat account, it will not be repeated here. Please refer to the discussion in that section as it likely applies to portions of this Habitat as well.

Typically, the conifers are generally between 30 to 65 m in height and the lower broadleaved canopy 10 m to 30 m (Anderson 1988). The conifer overstory may not always be present. The broadleaf understory is generally a closed canopy with evergreen and some deciduous trees (Barbour and Minnich 2000).

Usually, this Habitat contains little understory although shrubs may be important in ecotone or post-burn situations (Anderson 1988). The understory typically is comprised of: elk clover *(Aralia californica);* hillside gooseberry *(Ribes californicum);* and poison-oak (*Toxicodendron diversilobum),* and a set of herbs and herbs including round-leaved boykinia (*Boykinia rotundifolia),* miner's lettuce (*Calytonia perfoliata), Darisca glomerata*, common chickweed *(Stellaria media),* and wood fern *(Dryopteris arguta).* Understory shrubs, herbs and mosses generally comprised less than 25% of the overall percent cover (Barbour and Minnich 2000). The annual grasses common in oak woodlands do not extend into the mixed evergreen forests.

PHYSICAL ENVIRONMENT

Because descriptions of the Habitat vary widely, descriptions of the physical environment also vary. In general, the Habitat occurs between 500 and 1800 m in southern California in moist, mesic areas with the exception of the Coulter pine phase which occurs on xeric sites.

Thorne (1976) places the elevation limits of this community between 500 to 1675 m within southern California. The Habitat generally occurs in moister canyons associated with riparian woodlands but also may intergrade with chaparral or yellow pine forest in drier areas. In southern California, Anderson (1988) identifies mixed evergreen forest in coarse, well-drained mesic sites, often on steep terrain within narrow valleys, from 605 to 1760 m (Anderson 1988). Average rainfall is between 60 and 170 mm and air temperatures are between -2°C and 36°C (Anderson 1988). When compared with oak woodlands, this Habitat occurs in significantly cooler areas (mean annual temperature is 14° C) which receive greater precipitation (Barbour and Minnich 2000).

The Coulter pine phase, which more likely belongs in the lower montane coniferous forest Habitat, occurs between 1200 and 1800 m in the Transverse and Peninsular ranges (Barbour and Minnich 2000). The upper portions of this Habitat can be considered to have three dominants: canyon live oak, Coulter pine and big-cone Douglas-fir, where the first two occur on more xeric and frequently disturbed sites and the first and last occur on more mesic, fire-protected sites (Barbour and Minnich 2000).

ECOSYSTEM PROCESSES

Following a fire or other disturbance, recovery in mixed evergreen forest will occur at different rates among conifers and hardwoods (Anderson 1988). Typically, mesic sites support more rapid conifer regrowth whereas hardwoods are dominant for longer on xeric sites (Anderson 1988). The conifer component is typically fully grown after 30 to 50 years to develop while the

broadleaved phase usually requires 60-90 years (Anderson 1988). The Coulter pine phase of this Habitat type seems to be an obligate fire type due to the presence of serotinous cones, although some contend that this only is true where the trees are adjacent to chaparral.

THREATS

Information regarding specific pest infections of this Habitat are not readily available. However, different pests associated with specific trees are likely to affect trees in this Habitat. Specific information regarding the effects of fire suppression also is lacking in the literature. It can be stated, however, that fire suppression activity has led to denser growth hindering the establishment of those seedlings requiring bare ground (Holland and Keil 1995).

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