

# Subalpine Coniferous Forest

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**VEGETATION ASSOCIATION:** SUBALPINE CONIFEROUS FOREST

**MAPPED SUBASSOCIATIONS:** None

## DATA CHARACTERIZATION

Because of the very limited range where climatic conditions are appropriate, the single occurrence of this Habitat within the Plan Area seems to be correct. It should be noted that other occurrences were noted in the literature, however these areas likely were mapped as southern California white fir or lodgepole pine forest.

## BIOGEOGRAPHY

Subalpine coniferous forests occur in the Klamath, Cascades, Sierra Nevada, Transverse and Peninsular ranges (Holland and Keil 1995). In the southern ranges, south of Mount Whitney, it occurs mainly on the western slopes (Holland and Keil 1995).

Elevation range estimates for this Habitat vary widely, probably due to differences in the community classification, and are presented below. Holland and Keil (1995) place the California lower elevation range between 2000 m, in the Klamath mountains, and 2900 m in the southern mountains (Holland and Keil 1995). Northern limits range from 2500 m in the Klamath mountains to 3500 m in southern California (Holland and Keil 1995). Sawyer and Keeler-Wolf (1995) describe the California range slightly more narrowly: between 2200 and 3350 m. Grouped to include lodgepole pine forest, whitebark pine-mountain hemlock forest, and limber pine forest, Thorne (1976) states that limber pine, as a species, occurs below the treeline between 1675 and 2900 m in the northern part of the state and 2400 to 3500 m in the southern part.

## RANGE AND DISTRIBUTION WITHIN WESTERN RIVERSIDE COUNTY

Limber pine is the dominant tree species on the ridges and high slopes of Marion and San Jacinto peaks and is common on Tahquitz Peak (Thorne 1977). It also is known from between 2440 m and the summit of Toro Peak in the Santa Rosa Mountains. This Habitat was mapped in a small area immediately west of the San Jacinto peak on the eastern edge of the Plan Area, totaling 541 acres.



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## VEGETATION CHARACTERISTICS

There is general agreement that limber pine (*Pinus flexilis*) dominates this Habitat. The extent and diversity of other conifers occurring in this community variably are described in the literature. Several interpretations are presented below.

Thorne (1976) refers to this Habitat as limber pine forest. Although pure stands are common, other pines, namely Jeffrey pine (*Pinus jeffreyi*) and lodgepole pine forest (*Pinus contorta ssp. murrayana*), may occur. Munz and Keck (1949) list the following species: whitebark pine (*Pinus albicaulis*), foxtail pine (*Pinus balfouriana*), western hemlock (*Tsuga mertensiana*), and willow (*Salix petrophila*) in addition to the list above. Sawyer and Keeler-Wolf (1995) describe limber pine occurring with lodgepole pine forest and white fir (*Abies concolor*) in the subalpine region of the Transverse and Peninsular ranges. According to Holland and Keil (1995) lodgepole pine forest and red fir (*Abies magnifica*) occur often in this community, but do not form stands, whereas Jeffrey pine and white fir occur only occasionally. Limber pine dominates an open canopy which is generally less than 18 m in height (Sawyer and Keeler-Wolf 1995).

Shrub cover is infrequent to common and ground cover usually is sparse (Sawyer and Keeler-Wolf 1995). Many timberline shrubs occur in this Habitat including southern alpine buckwheat (*Eriogonum kennedyi* var. *alpigenum*) (Thorne 1976). Other shrub and herbaceous species include buckwheat (*Eriogonum incanum*), wax currant (*Ribes cereum*), willows (*Salix* spp.), western blueberry (*Vaccinium uliginosum* ssp. *occidentale*), dwarf bilberry (*V. caespitosum*), mountain-laurel (*Kalmia polifolia*), mountain gooseberry (*Ribes montigenum*), columbine (*Aquilegia pubescens*), stonecrop (*Sedum obtusatum*), shrubby cinquefoil (*Potentilla fruitcosa*), white heather (*Cassiope mertensiana*), mountain-heather (*Phyllodoce breweri*), rock-spiraea (*Holodiscus microphyllus*), Great Basin sagebrush (*Artemisia tridentata*) and beardtongue (*Penstemon heterodoxus*) (Holland and Keil 1995; Munz and Keck 1949). Herbaceous vegetation varies from very sparse in dry areas to lush and meadow-like in wet areas (Holland and Keil 1995).

## PHYSICAL ENVIRONMENT

These trees generally form a relatively narrow band from about 2600 m to the timberline. Munz and Keck (1949) cite the following environmental conditions: average precipitation from 76 to 130 cm mostly as snow, growing season from seven to nine weeks, and mean summer temperatures probably less than 65° F.



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Soils at these high elevations generally are shallow, contain little organic matter, and do not retain water well (Holland and Keil 1995). Soils generally consist of coarse sand, gravel, volcanic debris, and rock materials (Verner and Purcell 1988). Wind, often carrying ice particles, are a common environmental factor in this region and limit tree growth near the timberline (Holland and Keil 1995). In this harsh environment, killing frost can occur at any time (Parsons 1980).

In a general description, Parsons (1980) describes the distribution of subalpine conifers as “scattered among the sparsely vegetated ridges, barren rocky outcrops and draws inhabited by dense, low, riparian vegetation.” Tree density decreases as elevation increases within this Habitat type (Verner and Purcell 1988).

## ECOSYSTEM PROCESSES

Fire is an infrequent occurrence at these high elevations. When fires occur, they usually are severe and replace the stand (Stephenson and Calcarone 1999). This may explain why limber pine outcompetes other conifers, due to its ability to regenerate without fire, its longevity and its ability to tolerate extreme cold (Verner and Purcell 1988). This Habitat occurs most frequently on low-quality soils although the limber pine grows best on calcareous soils (Barney 1980).

## THREATS

Subalpine areas are relatively undisturbed with the exception of some heavy recreation use on mountaintop trails (Stephenson and Calcarone 1999). The western dwarf mistletoe (*Arceuthobium campylopodum*) infects limber pine in this Habitat. Mistletoe is managed mainly through the pruning and removal of infected trees (Stephenson and Calcarone 1999).

## LITERATURE CITED

- Holland, V. L. and David J. Keil. 1995. California Vegetation. Kendall/Hunt Publishing Company.. Dubuque, Iowa.
- Munz, Philip A. and David D. Keck. 1949. California Plant Communities. El Aliso, Vol. 2, No. 1: 87-105.



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- Parsons, D. J. 1980. California mixed subalpine. Pages 90-91 *In* F. H. Eyre, editor. Forest cover types of the United States and Canada. Society of American Foresters, Washington, D.C.
- Sawyer, John O. and Todd Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, CA.
- Steele, Robert. 1990. *Pinus flexilis* - limber pine. Pages 348-353 *in* R.M. Burns and B. H. Honkala, technical coordinators. Silvics of North America, Volume 1. Conifers. Agriculture Handbook 654. USDA, Forest Service, Washington, D.C.
- Stephenson, John R. and Gena M. Calcarone. 1999. Southern California mountains and foothills assessment: Habitat and species Conservation issues. General Tehnical Report GTR-PSW-172. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 402 p.
- Thorne, Robert F. 1976. The Vascular Plant Communities of California. *In* Symposium Proceedings: Plant Communities of Southern California. ed. June Latting. California Native Plant Society, Special Publication No. 2. Berkeley, California. 1-31.
- Thorne, Robert F. 1977. Montane and Subalpine Forests of the Transverse and Peninsular Ranges *In* Terrestrial Vegetation of California. ed. Michael G. Barbour and Jack Major. John Wiley and Sons, New York: 538-557.
- Verner, Jared and Kathryn L. Purcell. 1988. Subalpine Conifer. *In* A Guide to Wildlife Habitats of California. ed. Kenneth E. Mayer and William F. Laudenslayer, Jr. California Department of Forestry and Fire Protection, Sacramento, California. 40-41.

