California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group

Ponderosa Pine

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Vegetation

Structure-- Tree spacing in ponderosa pine stands varies from open patchy to extremely close. On high quality sites, virgin stands may be 46-55 m (150-180 ft) high, with diameters from 0.91.2 m (3-4 ft) (Harlow and Harrar 1950). Typical overstory coverage of all layers may exceed 100% (Vankat 1970). Other conifers, when present, provide denser crowns than do the pine, thus creating habitat diversity. Grasses, shrubs, and deciduous trees may be present or absent. Typical coverage of shrubs is 10-30% and of grasses and forbs is 5-10% (Barbour 1986).

Composition-- The ponderosa pine habitat includes pure stands of ponderosa pine as well as stands of mixed species in which at least 50% of the canopy area is ponderosa pine. Associated species vary depending on location in the state and site conditions. Typical tree associates include white fir, incense-cedar, Coulter pine, Jeffrey pine, sugar pine, Douglas-fir, bigcone Douglas-fir, canyon live oak, California black oak, Oregon white oak, Pacific madrone and tanoak.

Associated shrubs include manzanita, ceanothus, mountain-misery, Pacific dogwood, hairy yerba-santa, yellowleaf silktassel, bitter cherry, California buckthorn, poison-oak, Sierra gooseberry. Grasses and forbs include slimleaf brome, Orcutt brome, carex, smallflower melicgrass, bluegrass, bottlebrush squirreltail, bedstraw, bracken fern, bush morning-glory, rhomboid clarkia, Child's blue-eyed mary, shrubby eriastrum, splendid gilia, Sierra iris, whisker-brush, Inyo bush lupine, summer lupine, purple nightshade, streptanthus, gooseroot violet, and wild iris.

Other Classifications-- The ponderosa pine habitat, as defined here, forms a part of the yellow pine forest of Munz and Keck (1959) and Thorne (1977), the montane forest of Griffin and Critchfield (1976)(No 1976 Lit Cite. There is a 1972 Lit Cite. 1972 Cite not placed in Lit cite at end.), the ponderosa/Jeffrey pine series of Pays More restrictive types which include only a part of the ponderosa pine habitat are Pacific ponderosa pine (245) (Eyre 1980), ponderosa pine (Parker and Matyas 1979 and Barbour and Major 1977), western Sierra ponderosa pine forest (Barry unpublished, cited in Cheatham and Haller 1975), ponderosa pine series of the Sierra montane conifer forest (Pase 1982a), Coast Range ponderosa pine forest and "westside" ponderosa pine forest (Cheatham and Haller 1975), and Sierran yellow pine forest (Küchler 1977). en, et al. (1980) and the mid-montane conifer forest of Barbour (1986). In addition, on those sites where ponderosa pine is dominant, portions of other montane forests (Küchler

1977), and Pacific ponderosa pine-Douglas-fir (Barbour 1986), and mixed conifer (244, 243), (Eyre 1980) are included in ponderosa pine habitat.

Habitat Stages

Vegetation Changes-- 2-5;SD. Most ponderosa pine stands that include other coniferous trees probably are maintained by periodic ground fires. In many of these stands, crown fires result in dense montane chaparral communities (Cheatham and Haller, 1975). Young, dense stands, as in plantations, exclude most undergrowth once trees attain a closed canopy. Prior to that, dense brush is typical, but an herbaceous layer may develop on some sites.

Duration of Stages-- On sites or areas that are dry or of low quality, significant pine regeneration may depend on concurrent disturbance of chaparral and a good pine seed crop with favorable weather. Thus, it may require 50-100 years for significant pine regeneration in the absence of intervention. Clearcuts with minimal brush control develop a dense stand of pole-size trees in 2030 years, twice the time required when brush is completely removed. Dense brush is typical in young stands and an herbaceous layer may develop on some sites. On drier sites, there is less tendency for succession toward shade-adapted species. Sites disturbed by fire or logging sometimes are converted to dense montane chaparral or mixed chaparral. Moist chaparral areas of higher site quality tend to develop directly into mixed conifer stands. As young, dense stands age and attain a closed canopy, they exclude most undergrowth. When other adapted conifers occur in moist ponderosa pine stands of medium to high site quality, they may form a significant understory in about 20 years in the absence of fire. If allowed to continue, such succession may change the structure and composition of the stand within 40 years sufficiently to favor wildlife adapted to mixed conifer habitats. Most ponderosa pine stands that include other coniferous trees probably are maintained by periodic ground fires (Cheatham and Haller 1975).

Biological Setting

Habitat-- In Northern California, ponderosa pine stands occur above coastal oak woodland, valley oak woodland, blue oak woodland, blue oak-foothill pine and below mixed conifer. Montane hardwood stands may be below or interspersed with ponderosa pine. Jeffrey pine stands often occur above ponderosa pine, but may be found on serpentine soils or on harsh sites at lower elevations in the ponderosa pine zone. Farther south, coastal scrub, chamise-redshank, mixed chaparral, or woodland oaks are typical at the lower boundary of the ponderosa pine habitat, with bigcone Douglas-fir or true firs at the upper edge. Dry, rocky sites within the habitat may support montane chaparral, mixed hard wood-conifer or closed-cone pine-cypress. Isolated, small patches of bigcone Douglas-fir may occur in mesic canyons or on north-facing slopes within ponderosa pine stands.

Wildlife Considerations-- Ponderosa pine sometimes is a transitional or migratory habitat for deer and can be extremely important to deer nutrition in migration holding areas. A mixture of early and late successional stages closely interspersed probably will provide good general wildlife habitat but riparian zones, deer migratory routes and holding areas require special consideration during management planning. The California condor uses the ponderosa pine habitat from Madera and Santa Clara Counties southward. Moreover, the Sierra Nevada red fox, Siskiyou mountain salamander and Shasta salamander also are found in the habitat.

Physical Setting

The lower elevational limit of the habitat may correspond to a mean annual temperature less than 13 C (55 F) and precipitation greater than 350 mm (33 in) except in southern California (Barbour 1986). Brown (1982) reported a minimum precipitation level of 635 mm (25 in) annually in the Peninsular Ranges. Ponderosa pine is found on all aspects, depending on soils and location within the local elevational range. Less than one-third of the precipitation is snowfall (Barbour 1986).

Distribution

Ponderosa pine habitat is found on suitable mountain and foothill sites throughout California except in the immediate area of San Francisco Bay, in the north coast area, south of Kern County in the Sierra Nevada and east of the Sierra Nevada Crest. Elevational ranges include 240-180 m (800-5000 ft) in the northern Sierra Nevada and Cascades, 1200-2100 m (3937-6890 ft) in the central and southern Sierra Nevada and 1300-2140 m (4265-7021 ft) in the Transverse and Peninsular Ranges, although it may be found as low as 105 m (3445 ft) in moist south-coastal sites (Rundel et al. 1977, Thorne 1977, Brown 1982 and Cheatham and l Haller 1975). The ponderosa pine habitat is replaced by Jeffrey pine on the Mojave Desert slopes of the Transverse Range and often on the eastern side of the Peninsular and Coast Ranges.

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