

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

Aspen

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Vegetation

Structure-- Mature stands of quaking aspen usually have relatively open canopies, often shared with other deciduous trees and a few conifer species, typically pines. Average canopy closures of stands in eastern California range from 60 to 100 percent in young and intermediate-aged stands and from 25 to 60 percent in mature stands (E. L. McGraw, pers. comm.). Quaking aspens often attain a height of 18 m (60 ft) and a diameter of 0.6 m (2 ft) (Brockman et al. 1968). Extraordinary trees may reach a height of 30 m (100 ft) and a diameter of about 1 m (3 ft) (Strothmann and Zasada 1957). The open nature of the stands results in substantial light penetration to the ground. Therefore all stands have an herbaceous understory with about half maintaining a tall shrub layer (DeByle and Zasada 1980).

Composition-- Aspen stands are typically composed of clones representing one or more genetic lines. They vary from a few stems on less than 1 ha (2.5 acres) to thousands of stems on 20 ha (50 acres) or more (Barnes 1975). Associated subdominant tree species may include willows, alders, black cottonwood, lodgepole pine, Jeffrey pine, ponderosa pine, red fir, white fir, Douglas-fir, and Engelmann spruce (Thorne 1977, DeByle and Zasada 1980, Parker and Matyas 1981). In communities near climax, however, quaking aspen is conspicuously the dominant species in the canopy.

Important understory shrubs include sagebrush, roses, snowberry, western chokecherry, and western serviceberry. Forbs are usually more abundant than grasses and sedges, and the herbaceous component is typically so rich and diverse as to defy description (DeByle and Zasada 1980).

Other Classifications-- This cover type is referred to as Aspen Woodland by Thorne (1977), Quaking Aspen by Parker and Matyas (1981), and the Aspen Series by Paysen et al. (1980). DeByle and Zasada (1980) describe the type over its entire distribution in the United States and Canada.

Habitat Stages

Vegetation Changes-- 1;2-5.S-D;6. Following disturbance, succession proceeds rapidly from an herbaceous layer to shrubs and trees, which invade together. The successional status of aspen stands is unsettled. Most authorities regard it as an early seral

stage that invades after fire or other disturbances (Strothmann and Zasada 1957). Consequently, successful, long-term suppression of fires or excessive grazing and browsing by ungulates may result in the eventual disappearance of quaking aspen from an area (Gruell and Loope 1974).

All stands spread by root suckering, resulting in stands comprised of a mosaic of clones of different ages, ranging in size from less than 1 ha (2.5 acres) to more than 20 ha (50 acres) (DeByle and Zasada 1980). Quaking aspens, intolerant of shade, are gradually replaced by more shade-tolerant conifers. "Owing sometimes to the paucity of coniferous seed trees and perhaps also to increasing aridity, the rate of coniferous invasion is so slow that a virtually permanent (climax) type has developed on some sites. On these, aspen vegetatively reproduces repeatedly and develops into all-aged stands" (DeByle and Zasada 1980:96).

Duration of Stages-- The rate of succession in aspen stands varies considerably, even within the same physiographic province (Bartos 1973). Therefore, it is difficult to generalize about the rates. Typically, however, early successional stages are of short duration. The herbaceous stage gives way to a shrub-seedling stage within 5 years. The shrub-seedling stage develops into a pole-sized stand usually within 10 to 15 years, with trees maturing within 30 years. Although quaking aspens are relatively short-lived trees, and subject to significant heart rot, DeByle and Zasada (1980) report intact stands 200 years of age.

Biological Setting

Habitat-- Aspen stands in California occur primarily at higher elevations near seeps, streams, and meadows on the eastern slopes of the Sierra Nevada and Cascade Ranges. Zonally they are found within the Red Fir, Mixed-conifer, and Lodgepole Pine habitats (Thorne 1977, Parker and Matyas 1981). Aspens commonly occur adjacent to Sagebrush habitats and other montane shrub types, where they are often the only tree species present. They are also found along streams adjoining Jeffrey Pine habitats. At higher elevations they occur with whitebark pine, where they grow in a shrubby, wind-pruned form (Parker and Matyas 1981).

Wildlife Considerations-- Although no wildlife species is totally dependent on habitats dominated by aspen, this cover type adds significantly to the richness of the wildlife in areas where it occurs. The habitat typically has a shrubby ecotone with adjacent meadows. This and the shrub understory within stands provide nesting cover for several species that might otherwise be scarce or absent. The mesic sites that permit aspen to establish also result in higher insect production compared to adjacent forests or shrublands. Such insect production, together with a high rate of fungal infection of trees, is thought to account for the greater variety and abundance of birds in ASP habitats than in adjacent forests and shrublands (Winternitz 1980). Aspen stands are habitats favored by a variety of cavity-nesting birds, such as bluebirds, sapsuckers, downy woodpeckers, and chickadees. Snags are important to cavity nesters in these stands, but live aspens are

easily and therefore commonly drilled by excavating species. On the eastern slopes of the Sierra Nevada, aspen stands adjoining sagebrush and other shrub habitats apart from forested sites often provide nesting cover for northern goshawks. (E. L. McGraw pers. comm.).

Physical Setting

Aspen stands occur at high elevations on a variety of sites and soils. A high water table during the early part of the growing season is required. Therefore, these stands are good indicators of moist conditions (Parker and Matyas 1981). Sites with permanent high water tables are occupied by willows (Thorne 1977), with which aspens may form ecotones. Soils range "from shallow stony soils and loamy sands to heavy clays. Best development occurs on well-drained sandy to silt loam soils" (DeByle and Zasada 1980). The climate is rigorous long winters with heavy snows and very cold temperatures, hence a short growing season.

Distribution

Most ASP habitats in California are found within 80 km (50 mi) of the Nevada border from Mono County to Plumas County. Small stands are scattered generally north and westward from there into northern Trinity and western Siskiyou Counties (Griffin and Critchfield 1972). Disjunct populations occur in the White and San Bernardino Mountains (Lloyd and Mitchell 1966, Paysen et al. 1980). Elevational limits generally range from 2000 to 3000 m (6550 to 9850 ft), although quaking aspen occurs as low as 915 m (3000 ft) at McArthur-Burney Falls State Park, Shasta County (Griffin and Critchfield 1982)(No 1982 Lit Cite. Only a 1972 Cite). Aspen stands do not extend to the upper tree line in any locality (DeByle and Zasada 1980).

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