
Appendixes

Appendix 1. Western Juniper Old-growth Cover Type

Species: *Juniperus occidentalis*—western juniper

Description:

Western juniper is usually the only tree species, with the exception of scattered trees growing with ponderosa pine (*Pinus ponderosa*). Stands exhibit considerable diversity in structure and composition, varying from open-shrub tree savannas to nearly closed-canopy woodlands. However, tree canopy cover in the majority of stands is usually less than 20 percent. Ages are usually mixed with little to no recruitment in closed stands. Very old stands usually contain standing and downed dead trees that can persist for several hundred years, especially on dry sites and where down trees do not come into contact with soil. As trees mature (usually over 150 years), their inverted cone shaped canopy becomes increasingly nonsymmetrical in appearance with rounded tops and spreading canopies that may become sparse and contain dead limbs or spike tops. The bark on the trunk becomes deeply furrowed, fibrous (compared to scaly in younger trees), and can turn reddish in color. Lower branches may be very large (more common in open stands), and branches are covered with bright green arboreal fruticose lichens (*Letharia columbiana* and *L. vulpina*). The cambium layer may also die around portions of the tree trunk, leaving only a narrow strip connected to a single live branch.

Understory composition and stand structure are highly dependent on the ecological site, especially soils. In low sagebrush communities stand structure is a tree shrub savanna with tree and shrub canopies usually less than 20 percent. The diagnostic grass species on these shallow soil sites is Sandberg bluegrass (*Poa sandbergii*). These stands can vary from small scattered communities surrounded by mixed conifers in the Blue Mountains to expansive

communities located on low sagebrush tablelands in the High Desert, Klamath, and Humboldt ecological provinces. On sedimentary soils understory vegetation is often sparse. Less common are stands that occupy deeper soils (i.e., Juniper Mountain, Oregon). On these sites tree canopies will generally vary from 30 to 40 percent on south and west aspects and exceed 50 percent on north aspects. Shrubs such as mountain big sagebrush (*Artemisia tridentata* ssp. *vaseyana*) are usually sparse and the abundance of herbaceous vegetation is determined by soil depth.

Historically humans have had minimal effects on these stands. Grazing has generally had little effects in these communities due to limited water (Mazama Province) and sparse forage. In the early 1900's and 1930's, limited number of trees were cut by homesteaders for firewood and posts; some areas were harvested for fence posts by the Civil Conservation Corps. More recently, firewood cutting (i.e., Modoc Plateau, California), selective cutting for high-quality furniture, cutting for urbanization, and landscaping decorations, and off-road vehicle use have impacted these stands.

The most extensive stands occupy pumice soils in the Mazama Province. In adjacent ecological provinces, stands occupy soils that are usually shallow, rocky, and high in clay content. Soil temperature regimes are usually mesic and frigid. Old-growth western juniper can be found throughout this species' range. In the southern portion of its range it hybridizes with Utah juniper (*Juniperus osteosperma*) (i.e., Jackson Mountains, Nevada, and along the California border south of Adel, Oregon).