Ecological site group F021XG913CA
Wet Clayey

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Key Characteristics

- Upland sites
- > 30" ppt
- > 20" depth
- Clayey texture

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

Physiography

Winterim soils are on plateaus. Slopes are 0 to 60 percent. Elevations are 1,480 to 2,000 meters.

Soil features

This ESG is primarily on Winterim soils in MLRA 21. Winterim soils are clayey-skeletal, smectitic, frigid Pachic Argixerolls. Winterim series characteristics include:

Soil moisture: Typically moist in winter and spring; dry for 80 to 100 consecutive days following the summer solstice; xeric moisture regime.
Mean annual soil temperature: 7 to 8 degrees C.
Mollic epipedon thickness: 50 to 76 centimeters; includes the Bt1 and Bt2 horizons.
Depth to base of argillic horizon: 100 to 150 centimeters.
Depth to bedrock: 100 to 150 centimeters; lithology is weathered volcanic rock such as basalt.
Base saturation (sum of cations): 75 to 85 percent.
Reaction: Slightly acid or neutral.

Particle-size control section
Clay content: Averages 35 to 50 percent.
Rock fragments: Averages 35 to 60 percent, mainly gravel. Lithology of fragments is volcanic rocks such as basalt and tuff.

Vegetation dynamics

The ponderosa pine habitat includes pure stands of ponderosa pine as well as stands of mixed species in which at least 50 percent of the canopy area is ponderosa pine. Associated species vary depending on location in the state and site conditions. Associated tree species 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, western juniper, Pacific madrone, and tanoak. In northern California, ponderosa pine stands are below mixed conifer woodlands, and above coastal oak, valley oak, blue oak, and blue oak-foothill pine woodlands. Montane hardwood stands may be below or interspersed with ponderosa pine stands. Jeffrey pine stands are typically above ponderosa pine stands, but may be found on serpentine soils or on harsh sites at lower elevations in the ponderosa pine zone.

Associated shrubs include manzanita, ceanothus, mountain misery, Pacific dogwood, hairy yerba santa, yellowleaf silktassel, bitter cherry, California buckthorn, poison oak, and Sierra gooseberry. Grasses and forbs include slimleaf brome, Orcutt's brome, sedge, smallflower melicgrass, bluegrass, squirreltail, bedstraw, brackenfern, bush

morning-glory, diamond clarkia, Child's blue eyed Mary, giant woollystar, splendid woodland-gilia, rainbow iris, whiskerbrush, grape soda lupine, summer lupine, purple nightshade, streptanthus ssp., goosefoot violet, and wild iris.

Most ponderosa pine stands that include other coniferous trees are likely maintained by periodic ground fires. In many of these stands, crown fires result in dense montane chaparral communities. Young, dense stands, as in plantations, exclude most undergrowth once trees attain a closed canopy. Prior to canopy closure, dense brush is typical. An herbaceous layer may develop on some sites.

On dry or low-quality sites, significant pine regeneration may depend on concurrent disturbance of chaparral, in conjunction with a plentiful pine seed crop and favorable weather. Thus, it may require 50 to 100 years for significant pine regeneration without intervention. Clearcuts with minimal brush control develop a dense stand of pole-size trees in 20 to 30 years, which is twice the time required when brush is completely removed. In young stands, dense brush is typical, and an herbaceous layer may develop on some sites. On drier sites, tendency decreases for succession toward shade-adapted species. Sites disturbed by fire or logging sometimes convert to dense montane chaparral or mixed chaparral. Moist chaparral areas 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 are present 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 sufficiently change the structure and composition of the stand within 40 years to favor wildlife adapted to mixed conifer habitats. Most ponderosa pine stands that include other coniferous trees are likely maintained by periodic ground fires.

Information from:

California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group
By E. Lee Fitzhugh

Major Land Resource Area

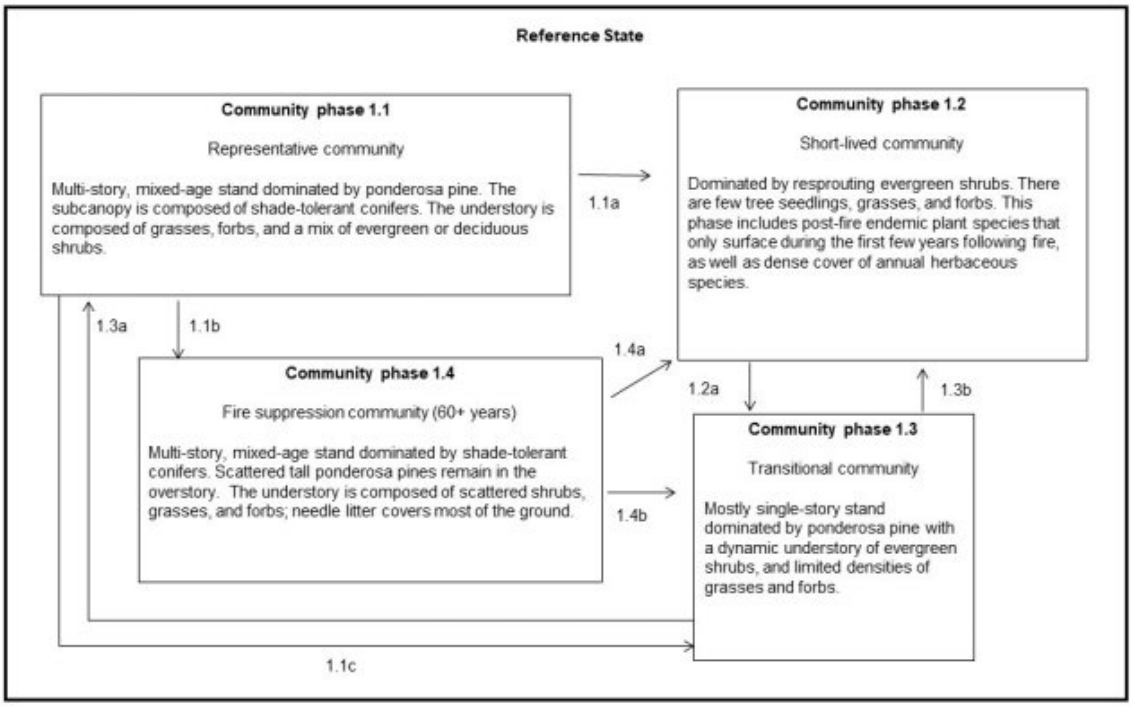
MLRA 021X
Klamath and Shasta Valleys and Basins

Stage

Provisional

State and transition model

Wet Clayey



Reference State Community Pathways (natural dynamics only – no management scenarios)

While low-severity fires are common in open-canopy forests with limited understory fuels, increased forest densities and an increased presence of ladder fuels in the understory fuel higher-severity fires. On a landscape scale, Jeffery pine habitats have a mixed-severity fire regime. Low-severity fire is defined as fire that replaces less than 25 percent of the dominant overstory (i.e., ponderosa pine and any co-dominants); moderate-severity fire replaces 25 to 75 percent of the dominant overstory; high-severity fire replaces at least 75 percent of the dominant overstory.

Community Pathway 1.1a: This community pathway occurs following a high-severity fire. Mechanical clearing and slash burning may produce the same results.

Community Pathway 1.1b: This community pathway occurs over time without fire (60+ years) as shade-tolerant conifers over-top and shade out ponderosa pines. This decreases ponderosa pine recruitment, increases ponderosa pine mortality, increases stand density, increases shade-tolerant conifer importance, and increases canopy closure as succession proceeds without fire in ponderosa pine-dominated stands.

Community Pathway 1.1c: This community pathway occurs following a low- to moderate-severity fire that removes younger subcanopy conifers, some ponderosa pines, and understory species.

Community Pathway 1.2a: This community pathway occurs over time without vegetation management or major disturbances.

Community Pathway 1.3a: This community pathway occurs over time without vegetation management or major disturbances.

Community Pathway 1.3b: This community pathway occurs following a low- to moderate-severity fire.

Community Pathway 1.4a: This community pathway occurs following a high-severity fire that removes everything.

Community Pathway 1.4b: This community pathway occurs following a moderate-severity fire.

Fire Effects Information System (FEIS) information: Across mountain ranges, successional advancement was slower in the drier, more southerly San Bernardino Mountains. In many fire-excluded areas, ponderosa pine and other early-seral, shade-intolerant tree species have been replaced successionally by late-seral, shade-tolerant species. Stand structure has changed from a mostly single canopy layer to multiple canopy layers.

Montane chaparral species are common post-disturbance on these deeper forest soils. After disturbance (logging, fire, erosion) chaparral proliferates and may exclude conifers and other vegetation for many years. However, chaparral may facilitate the germination of red fir seedlings and other shade tolerant conifers by providing protective cover, moderating microclimate, and improving soil conditions. Chaparral shrubs may be an essential link in forest succession by building up soil nutrient levels, especially nitrogen, to the point where trees can survive. In mature timber stands, chaparral species may senesce due to insufficient light through the canopy and are only present as a sparse understory. Thus, silvicultural practices have a strong influence on the structure of montane chaparral.

Citations