

Ecological site group F022BG201CA

Mesic Ash-Influenced Mountains

Last updated: 03/01/2021
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Key Characteristics

None specified

Physiography

This ESG is most typically found on the backslopes, shoulders and summits of mountains from 2000 to 5000 feet, but can range from 1200 to 6500 ft. on slopes from 10 to 50% (can be as low as 2% in some cases).

Climate

The average annual precipitation in this MLRA is typically 20 to 65 inches but can range from 13 to 123 inches (176 to 2,471 millimeters). This ESG averages between 35 to 80 inches. It is lowest in the lower valleys and highest on the mountain peaks. The precipitation falls mainly from fall to spring, mostly as snow. Winter precipitation is from Pacific storms that are frontal in nature. The amount of precipitation decreases from west to east. Summers are typically warm and dry, but there are occasional thunderstorms. The average annual temperature is 27 to 61 degrees F (-3 to 16 degrees C). The frost-free period for this ESG is generally greater than 100 days, and the freeze-free period averages 215 days and ranges from 85 to 350 days. The lowest annual temperatures and the shortest freeze-free periods occur in the mountains.

Soil features

The soils for this ESG are deep and very deep, fine-loamy, well drained soils that formed in material weathered from volcanic rock.

Vegetation dynamics

This ESG is part of the Sierran mixed conifer habitat type and is an assemblage of conifer and hardwood species that forms a multilayered forest. Historically, burning and logging have caused wide variability in stand structure, resulting in both even-aged and uneven-aged stands. Virgin old-growth stands where fire has been excluded are often two-storied, with the overstory comprised of mixed conifer and the understory white fir and incense-cedar. Forested stands form closed, multilayered canopies with nearly 100 percent overlapping cover. When openings occur, shrubs are common in the understory. Closed canopy stand distribution is both extensive and patchy depending on scale, site, slope, soils, microclimate, and history.

At maturity, the dominant conifers range from 30 to 60 m (100 to 200 ft) tall with a highly variable basal area of about 17 to 26 sq m (180 - 280 sq ft). Diameter breast height at maturity for pines and Douglas-fir is commonly greater than 1 m (40 in); white fir greater than 0.9 m (35 in) is common. Fuel loading in stands heavy with pine may reach 27,000 kg/ha (70 to 80 t/ac) in natural stands; whereas fuel loading in stands heavy with fir may reach 16,000 kg/ha (40 to 50 t/ac).

Five conifers and one hardwood typify the mixed conifer forest: white fir, Douglas-fir, ponderosa pine, sugar pine, incense-cedar, and California black oak. White fir tends to be the most ubiquitous species (though most often a minor overstory component) because it tolerates shade and has the ability to survive long periods of suppression in brush fields. Douglas-fir dominates the species mix in the north, but is absent south of the Merced River. Ponderosa pine dominates at lower elevations and on south slopes. Jeffrey pine commonly replaces ponderosa pine at high elevations, on cold sites, or on ultramafic soils. Red fir is a minor associate at the highest elevations. Sugar pine is found throughout the mixed conifer type. Black oak is a minor, but widespread, component in mixed conifer stands.

Though black oak does best on open sites, it is maintained under adverse conditions such as shade, ridge tops, and south slopes where conifers may regenerate in its shade. This ESG is primarily dominated by white fir, ponderosa pine, Douglas-fir, incense cedar, snowbrush, squaw carpet, manzanita and bottlebrush squirreltail.

California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group
Barbara H. Allen (2005)

This ESG is most commonly dominated by ponderosa pine, Douglas-fir, white fir, sugar pine, and incense-cedar with scattered black oak. Shrubs are prostrate ceanothus, whiteleaf and greenleaf manzanita, and deerbrush.

FEIS. Pacific Ponderosa Pine, <https://www.fs.fed.us/database/feis/plants/tree/pinponp/all.html>. Accessed September 28, 2020.

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E. Lee Fitzhugh

Major Land Resource Area

MLRA 022B
Southern Cascade Mountains

Stage

Provisional

State and transition model

Mesic Lava Plateaus, Low Sloping (15% or less), <25 inch precip

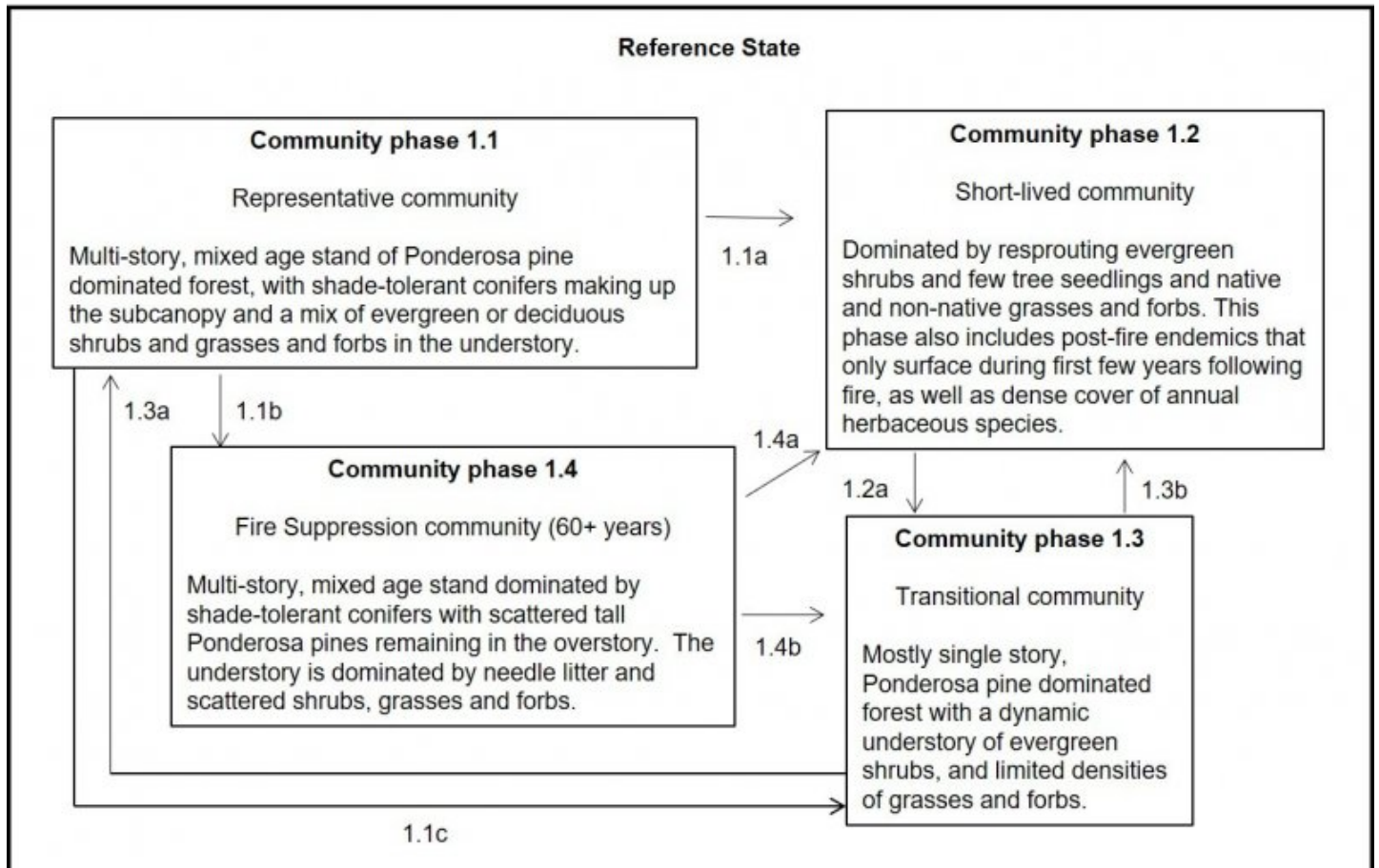


Figure .

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

While low-severity surface 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. 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. 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.

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.

**Low-severity fire is defined as fire that replaces <25% of the dominant overstory (i.e., ponderosa pine and any co-dominants); moderate-severity fire replaces 25% to 75% of the dominant overstory; and high-severity fire replaces >75% of the dominant overstory.

1.1a This community pathway occurs following a high severity fire. A prescription of mechanical clearing and burning of slash may also produce the same results.

1.1b This community pathway occurs over time without fire (60+ years), as the shade-tolerant conifers over top and shade out the Ponderosa pine. This results in decreased Ponderosa pine recruitment, increased Ponderosa pine mortality, increased stand density, increased shade-tolerant conifer importance, and increased canopy closure are common as succession proceeds without fire in Ponderosa pine-dominated stands.

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

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

1.3a This community pathway occurs over time without vegetation management or major disturbances and normal progression.

1.3b This community pathway occurs following a low to moderate severity fire.

1.4a This community pathway occurs following a high severity fire that removes everything.

1.4b This community pathway occurs following a moderate severity fire.

Figure 1.

Citations