

# Ecological site group F022AW002CAESG

## Alluvial Fans

Last updated: 08/01/2023  
Accessed: 04/30/2024

---

### Key Characteristics

- alluvial fans

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

Physiographic features: This ESG is found on gently sloping to steep (2 to 70%) alluvial fans at elevations typically over 5000 ft.

### Climate

The average annual precipitation is 40 to 80 inches (1,015 to 2,030 millimeters) in much of this area, but it as low as 6 inches (150 millimeters) in the lower valleys and foothills and as much as 100 inches (2,540 millimeters) on the mountain peaks. The amount of precipitation increases with elevation and from south to north. Summers are dry, but there are occasional thunderstorms. Much of the winter precipitation occurs as snow. The average annual temperature is 25 to 63 degrees F (-4 to 17 degrees C), decreasing with elevation. The freeze-free period averages 205 days and ranges from 65 to 345 days, decreasing in length with elevation. It is longest at the lower elevations along the western edge of the area.

### Soil features

The soils that dominate this ESG are moderately deep to very deep, well drained soils formed in glacial till, glacial outwash, volcanic rocks or mudflows, and alluvium derived primarily from granitic rocks.

Crazymule, a loamy-skeletal, isotic Xeric Dystrocrypts

Crozier, a fine-loamy, mixed, superactive, mesic Ultic Haploxeralfs

Gerle, a coarse-loamy, mixed, superactive, frigid Humic Dystroxerepts

### Vegetation dynamics

This ESG is characterized by the variable slopes, short growing days, and alluvial fan landforms. It 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 Jeffery pine, ponderosa, white fir, Douglas-fir, incense-cedar, sugar pine, snowbrush, greenleaf manzanita, Sierra chinkapin, western serviceberry, snowbrush ceonothus, and pinemat manzanita.

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

## Major Land Resource Area

MLRA 022A  
Sierra Nevada and Tehachapi Mountains

## Subclasses

- F022AW002CA—Alluvial Fans
- F022AY107NV—PICO/ARPA6/CAREX
- F022AY116NV—PIJE/ARTRV/ACOCO
- R022AE016CA—Dry Meadow
- R022AY022NV—LOAMY SLOPE 14-16 P.Z.

## Correlated Map Unit Components

22824468, 22824420, 22823769, 22824343, 22824337, 22824339, 22824340, 22824301, 22823319, 22823408, 22823409, 22485611, 22667598, 23025803, 23026048, 23026049, 23028032, 23027861, 23027865, 23027951, 23027867, 23027807, 23027811, 23027870, 23027958, 23027827, 23027828, 23026893, 23027140, 23027604, 23027267, 23028076, 23028526, 23028528, 23028350, 23028355, 23028178, 23028708, 23028710, 23028713, 23028714, 23028716, 23028184, 23028539, 23028187, 23028204, 23028560, 23028558, 23028206, 23028374, 23028410, 23028413, 23028415, 23028418, 22589688, 22589691, 22589692, 22589694, 22590021, 22590022, 22590024, 22589886, 22589796, 22589823, 22590054, 23488362, 23488579, 22591402, 22591319, 22592127, 22591810, 22591303, 22592112, 23483774, 23483825, 23483826, 23483827, 23483828, 23483829, 23483883, 23483335, 23483331, 23483930, 23483441, 23483464, 23483460, 23483465, 23483466, 23483657, 23483659, 22595684, 22595258, 22595272, 22610205, 22609765, 22609891, 22609742, 22610105, 23029338, 23031351, 23031337, 23032006, 23031968, 23031794, 23031399, 23031901, 23031547, 23031822, 23031416, 23031584, 23031711, 23031712, 23031839, 23031378, 23031373, 23031368, 22663310, 23149998, 23150002

## Stage

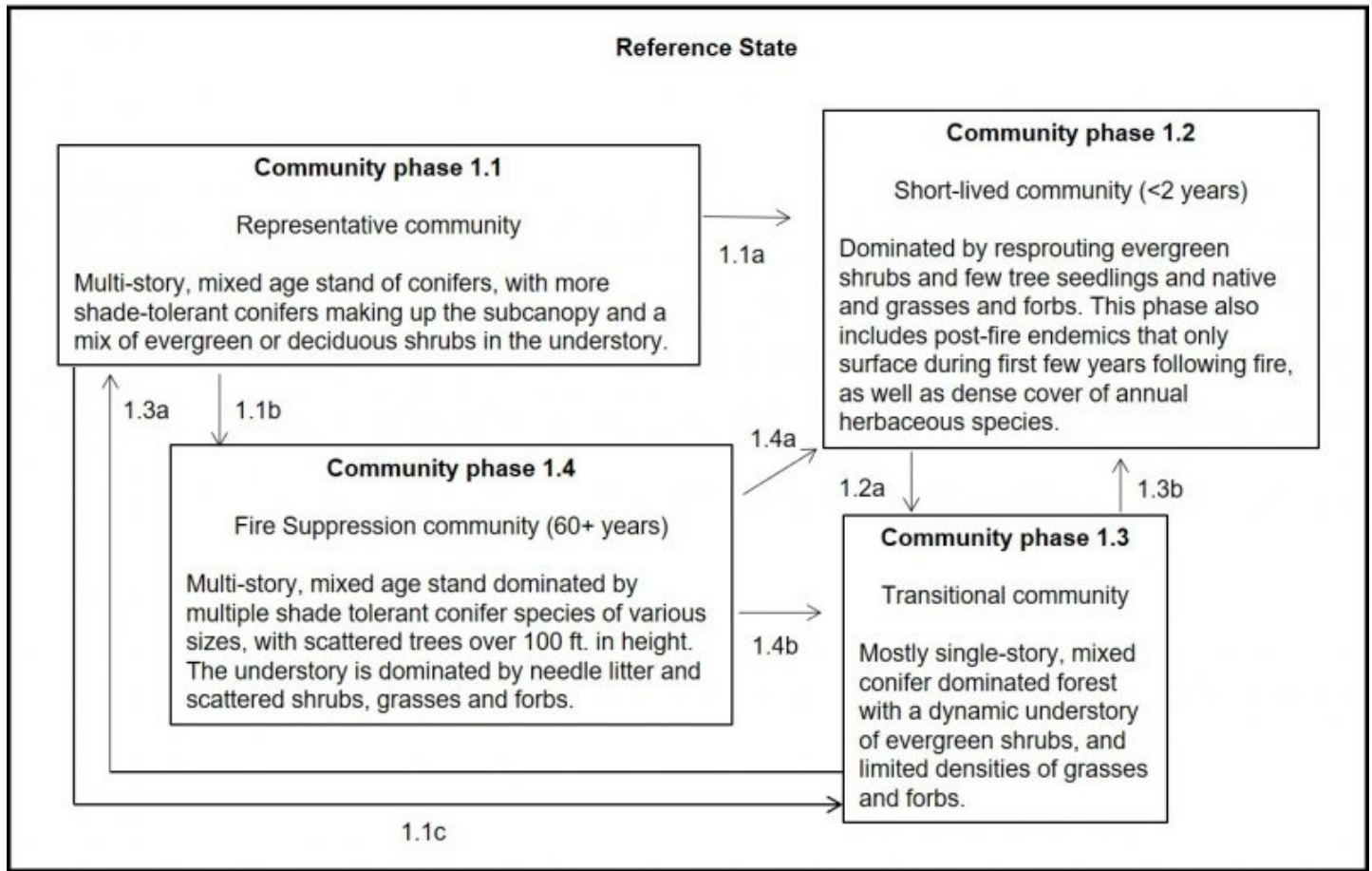
Provisional

## Contributors

Kendra Moseley  
Curtis Talbot  
Darren Pinnegar

## State and transition model

## Alluvial Fans



### 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. On a landscape scale, a mixed-severity fire regime occurs in Sierran mixed conifer habitats. After logging or burning, succession proceeds from an ephemeral herb to perennial grass-herb, through a shrub-perennial grass stage, to conifers (Burcham 1964). In many areas, however, shrubs appear in the first year after disturbance. The habitat stages are stage 1, grass-forb, with bedstraw, plantain, mountain brome, and needlegrass as common early succession species; stage 2, shrub-seedling-sapling, characterized by manzanita, Ceanothus, cherry, gooseberry, and mountain misery. In the seedling tree stage through the sapling tree, pole tree, small tree, and medium/large tree stages, the five conifers gain dominance of the site. Stage duration has been described by Verner (1980). The grass-forb stage, generally is short-lived (less than 2 years). The shrub-seedling-sapling stage is usually evident by yr 2 and lasts 10 to 40 yr; this stage is a mixture of shrubs and saplings up to 6 m (20 ft) tall depending on the site, degree, and type of disturbance. If tall shrubs capture the site, it may take 10 to 15 plus yr for trees to dominate the site. The pole-medium tree stage supports trees up to 15 m (50 ft) tall and may last from 15 to 90 yr on poor sites. The mature and overmature stages include stands greater than about 30 m (100 ft) in height.

- 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 more shade-tolerant conifers over top and shade out some of the more shade-intolerant species.
- 1.1c This community pathway occurs following a low to moderate severity fire that removes younger subcanopy conifers, some less fire tolerant trees 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.

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 a 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