Ecological site group F022AW009CAESG
Frigid Mountains <40"ppt

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Key Characteristics

- mountains
- frigid temp regime
- <40" ppt
- 20-40" depth

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

This ESG is found on mountains generally above 5000 ft. on variable slopes.

Climate

Annual precipitation at these sites is less than 40 inches (1000 millimeters). 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 most dominant in this ESG are moderately deep, well-drained to excessively drained soils formed in material weathered from granitic rocks and andesitic tuff.

Siretta, a sandy-skeletal, mixed, frigid Dystric Xerorthents
Waca, a medial-skeletal, amorphic, frigid Humic Vitrixerands

Vegetation dynamics

This ESG is characterized by moderately deep, frigid soils on mountain landforms with less than 40 inches of precipitation. It is part of the red fir habitat type, which is typically found on frigid soils over a wide range of topography exclusive of very wet sites. Annual precipitation ranges from 1000 to 3000 mm (40 to 50 in) per year, primarily as snow that forms packs up to 5 m (15 ft) in winter. Summers are dry, limiting tree growth to seasonally available soil moisture. Small pockets of lodgepole pine also occur in wet sites scattered throughout large tracts of red fir. Similar inclusions of aspen may be found along riparian zones. Mountain meadows of various sizes, sometimes associated with small lakes, are also typical of red fir habitats. At higher elevations, red fir habitats include increasing numbers of mountain hemlock, western white pine, whitebark pine, and to a lesser extent, foxtail pine and limber pine. Noble fir is associated with red fir in the northwestern region of California.

Stand structure is typified by even-aged (established within 20-year span) groups of trees that cover several to thousands of square meters. The cause of this pattern is probably a history of recurrent lightning fires, windthrows, and insect outbreaks acting to kill groups of trees. Natural regeneration occurs on the disturbed site following the next good cone crop. Young seedling stands are thinned by competition for soil moisture during summer. Logging is becoming a more common source of disturbance, creating larger openings on average than historic disturbances.

Mature red fir stands normally are monotypic, with very few other plant species in any layer. Heavy shade and a thick layer of duff tends to inhibit understory vegetation, especially in dense stands. To the north, in the Klamath Mountains, red fir gives way to noble fir.

After disturbance (typically logging or fire) red fir vegetation on a site proceeds through 4 seral stages: grass/forb, shrub/sapling, pole/medium tree, and large tree. The grass/forb stage occurs when red fir seedlings become established on mineral soil or shallow litter and require about 5 years to reach a height of 15 cm (6 in). Herbs are often sparse due to competition for soil moisture. In the shrub/sapling stage, large brush fields may develop after hot wildfires and are dominated by Ceanothus or other shrub species for many years. The pole/medium tree stage produces dense stands of young red fir that grow slowly with little mortality for many years. In the large tree stage, subdominant trees die and add to a growing layer of duff and downed woody material, and dominant trees continue to grow for several hundred years to heights of 40 m (130 ft). Old growth stands on poor sites in the Sagehen Creek drainage of Nevada County average about 400 years old. The understory of mature stands is limited to less than 5 percent cover of shade tolerant forbs (e.g., *Chimaphila menziesii*, Phyrola picta).

Seral patterns are defined here for both good and poor sites. The seral pattern on good sites includes 10 years in the grass/forb stage, 20 years in the shrub/seedling stage, 80 years in the pole/medium tree stage and 110 years in the large tree stage. The pattern on poor sites includes 20 years in the shrub/seedling stage, 100 years in the pole/medium tree stage and 250 years in the large tree stage. Hence the cumulative year totals are 200 from the good site and 400 from the poor site.

California Wildlife Habitat Relationships System
California Department of Fish and Game
California Interagency Wildlife Task Group
Reginald H. Barrett

Major Land Resource Area

MLRA 022A
Sierra Nevada and Tehachapi Mountains

Subclasses

- F022AF004CA–Frigid, Shallow To Deep, Sandy Mountain Slopes
- F022AF006CA–Loamy Frigid Metamorphic Slopes
- F022AW009CA–Frigid Mountains <40"ppt
- F022AY116NV–PIJE/ARTRV/ACOCO
- F022AY130NV–Pinus Jeffreyi/ Artemisia Tridentata Ssp. Vaseyana-Purshia
- R022AD002CA–Gravely Bedrock Slopes
- R022AD009CA–Bedrock Pocket Valley Bottoms
- R022AY022NV–LOAMY SLOPE 14-16 P.Z.
- R022AY030NV–GRAVELLY LOAM 14-16 P.Z.
- R022AZ043CA–SOUTH SLOPE 14-16 P.Z.
- R022AZ044CA–COARSE LOAMY 16-20 P.Z.

Correlated Map Unit Components

22824461, 22824458, 22824454, 22824065, 22824073, 22823783, 22823428, 22823287, 22822966, 22823002, 22945254, 22945120, 22945342, 22667293, 22667660, 22667715, 22667856, 22667345, 22667723, 22667352, 22668092, 22667058, 22667314, 23016072, 23016550, 23016556, 23016334, 23016372, 23015884, 23016430, 23022160, 23022167, 23021933, 23020683, 23020685, 23021318, 23025452, 23025286, 23025103, 23025219, 23025604, 23025978, 23026886, 23026889, 23027387, 23027418, 23027179, 23027664, 23027460, 23027199, 23027211, 23027667, 23027671, 23027676, 23027222, 23027475, 23027478, 23026983, 23026980, 23026987, 23026986, 23026993, 23027481, 23027227, 23027485, 23027231, 23027279, 23027534, 23027557, 23027316, 23027069, 23027071, 23027076, 23027079, 23027091, 23027092, 23028017, 23028016, 23027094, 23027095, 23027585, 23027582, 23027334, 23027942, 23027849, 23027783, 23028021, 23028027, 23027935, 23027098, 23026847, 23027587, 23027103, 23027371, 23027130, 23028698, 23028161, 23028519, 23028164, 23028343,

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Stage

Provisional

Contributors

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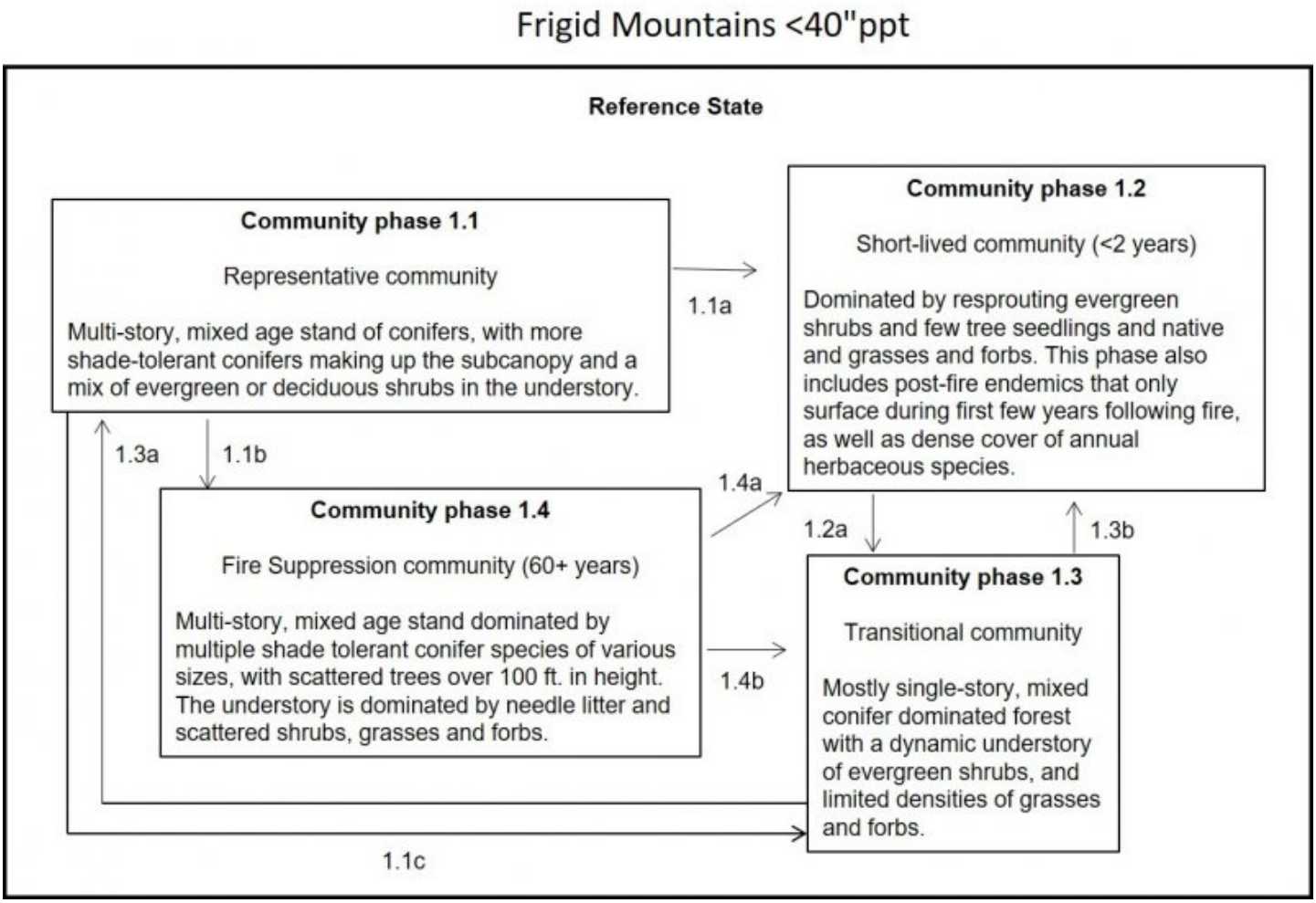
State and transition model



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

After disturbance typically logging or fire red fir vegetation on a site proceeds through 4 seral stages: grass/forb, shrub/sapling, pole/medium tree, and large tree. The grass/forb stage occurs when red fir seedlings become established on mineral soil or shallow litter and require about 5 years to reach a height of 15 cm (6 in). Herbs, are often sparse due to competition for soil moisture on light soils. In the shrub/sapling stage, large brush fields may develop after hot wildfires and are dominated by Ceanothus or other shrub species for many years. The pole/medium tree stage produces dense stands of young red fir that grow slowly with little mortality for many years. In the large tree stage, subdominant trees die and add to a growing layer of duff and downed woody material, and dominant trees continue to grow for several hundred years to heights of 40 m (130 ft). Old growth stands on poor sites in the Sagehen Creek drainage of Nevada County average about 400 years old. The understory of mature stands is limited to less than 5 percent cover of shade tolerant forbs (e.g., Chimaphila menziesii, Pyrola picta). Seral patterns are defined here for both good and poor sites. The seral pattern on good sites includes 10 years in the grass/forb stage, 20 years in the shrub/seedling stage, 80 years in the pole/medium tree stage and 110 years in the large tree stage. The pattern on poor sites includes 20 years in the shrub/seedling stage, 100 years in the pole/medium tree stage and 250 years in the large tree stage. Hence the cumulative year totals are 200 from the good site and 400 from the poor site.

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