

88. Teakettle Creek (Griffin 1975b)



Figure 175—
Teakettle Creek
ecological survey
area

Location

This study area (dropped from RNA consideration) is on the Teakettle Experimental Forest, Sierra National Forest. It occupies portions of sects. 16, 17, 20, 21, and 22 T11S, R27E MDBM (36°58'N., 119°02'W.), USGS Patterson Mountain (fig. 175). Ecological subsection – Upper Batholith (M261Eq).

Target Element

Red Fir (*Abies magnifica*)

Distinctive Features

Well-Developed Southern Sierra Red Fir Forest:

Red fir-dominated forest covers several hundred acres that are divided into many small stands with a wide range of density and basal areas (fig. 176). These are augmented with brushy stands and extensive transitions to white fir (*Abies concolor*)-dominated forest. This site is an excellent example of a S. Sierra red fir forest.

Watershed Values: The site includes three distinct watersheds, each of which has a gauging station. Thus, watershed studies relating to ecosystem input and output could be undertaken easily.

Well-Developed Meadows: The area contains several meadows including wet and dry types. Some are being invaded by conifers, but many of the meadow-forest boundaries are sharp.

Rare Plants: *Raillardella muirii* (CNPS List 1B) has been collected adjacent to the study site and is probably in the area.

Physical Characteristics

The area covers 1250 acres (506 ha). Elevations range from 6400 to 8050 ft (1951-2454 m). The area is drained by Teakettle Creek, a tributary of Kings River. The creek flows to the SE. with slopes of E., NE., and SE. predominating. Slopes are generally gradual; the average gradient is about 720 ft/mile (136 m/km).

Most of the area is on Triassic metamorphics, mainly quartzite. Small areas of Miocene basalt overlie the quartzite. The lowest elevations are underlain by granitic rocks. The gentle topography and unglaciated surface have produced deep soils in some areas. The Corbett series predominates, with depths of 4-5 ft (1.2-1.5 m). Climate is not discussed, but precipitation is likely to average 50 inches (1270 mm) per year (Rantz 1972).

Association Types

Twenty 20-m by 50-m plots were sampled in the area. These are equally divided between red fir and mixed conifer vegetation. The remainder of the associations are qualitatively described.

White Fir-Red Fir Forest (85310, 84240): 295 acres (119 ha). This is a transitional forest between red fir and mixed conifer forests, occurring at the mid-elevations of the study area. Dominance is traded between red fir and white fir (*Abies concolor*). Stand structure is similar to the pure red fir forest of higher elevations. In general, there is more red fir than white fir regeneration. Unlike many other

mid-montane areas in California, there seems to be no well-developed zone of white fir dominance here. Floristically, the scattered shrubs and herbs under the canopy are little different from those of the red fir forest. Three plots sampled in this association have tree densities, seedling densities, and basal area (respectively) ranging from 30 to 131/ha, 0 to 111/ha, and 25.7 to 104.5 m²/ha for white fir and 161 to 351/ha, 59 to 400/ha, and from 26.4 to 109.3 m²/ha for red fir.

Open Mixed Conifer-Brush (84230, 37510): 255 acres (103 ha). Parts of the higher-elevation mixed conifer stands are open with low shrub cover and may be considered a lower extension of the open red fir forest-brush association with similar understory composition. At lower elevations this association has many tall shrubs and may be dense. In rocky areas or on concave slopes *Prunus emarginata* dominates along with *Chrysolepis sempervirens* and *Ceanothus cordulatus*. The most exposed brush patches have considerable *Arctostaphylos patula* and colonies of shrubby California black oak (*Quercus kelloggii*) and *Chamaebatia foliolosa*. Portions of this area are dominated by Jeffrey pine (*Pinus jeffreyi*). These are very open stands (40 trees/ha, 9.6 m²/ha on one 0.1-ha sample).

Mixed Conifer Forest (84230, 85210): 236 acres (96 ha). This is an upper-elevation mixed conifer forest with white fir, Jeffrey pine, sugar pine (*Pinus lambertiana*), incense-cedar (*Libocedrus decurrens*), red fir, and occasional scrubby California black oak. The mixed conifer stands are more uneven-aged than the fir stands. White fir is the dominant seedling; red fir seedlings also are present over all but the shallowest soils and most xeric exposures. Ten plots were sampled in this association. Following is mean tree density, seedling density, and basal area (respectively) for the dominant trees: white fir: 350/ha, 346/ha, 31.6 m²/ha; incense-cedar: 57/ha, 17/ha, 13.3 m²/ha; Jeffrey pine: 25/ha, 10/ha, 13.1 m²/ha; sugar pine: 25/ha, 7/ha, 12.9 m²/ha; red fir: 40/ha, 49/ha, 5.7 m²/ha. Growth rates are slower in this forest (mean ring width = 1.38 mm) than in the following red fir association.

Red Fir Forest (85310): 200 acres (81 ha). This forest has a patchy distribution of closed stands where density and basal area are high (fig. 176). Much of the local red fir forest has many small openings with a senescent canopy. These openings contain scattered shrubs of *Chrysolepis sempervirens*, *Ceanothus cordulatus*, and occasional mats of *Arctostaphylos nevadensis*. Plots were all sampled in the denser areas; basal areas range from 71.9 to 168.5 m²/ha (mean 114.1 m²/ha, n=10). Maximum diameters of red fir are 6.5-7 ft (2.0-2.1 m) dbh; many trees are more than 4.25 ft (1.3 m) dbh. Variation is noted in growth rates, but ring-width averages 1.69 mm. Total tree density varies from 220 to 581/ha with an average of 341/ha. Red fir comprises an average relative density of 85 percent and an average relative cover of 84 percent. Average relative densities (per ha) and cover (m²/ha), respectively, of the two other sampled species are 49 and 18.3 (white fir) and 2 and 0.2 (sugar pine).



Figure 176—
Teakettle Creek, A
closed-canopy stand
of mature red fir representing the most
highly productive type
of red fir forest in the
Teakettle Creek area.
(1975)

Open Fir Forest-Brush (37510, 85310): 167 acres (68 ha). Well-developed montane chaparral does not exist locally. All the chaparral has scattered red fir and white fir at mid- and upper elevations and other mixed conifer species at lower sites. These open “fir woodlands” average less than 50 percent canopy cover and are dominated by extensive understories of *Arctostaphylos nevadensis*, with *Chrysolepis sempervirens*, *Ceanothus cordulatus*, and *Arctostaphylos patula* locally common. Tall shrub cover is usually open enough to allow easy passage. These openings are being colonized by fir and may indicate areas of past intense fires.

Wet Meadow (45100): 56 acres (23 ha). More than 20 individual wet meadows were mapped in the area. They are characterized as well developed and, in general, diverse. All appear to be associated with streams and gullies, and thus, they may be classified as stringer-type meadows. A list of characteristic species is not provided, but photographs indicate species such as *Veratrum californicum*, *Senecio triangularis*, and *Lupinus polyphyllus* ssp. *supurbus* among the tall herbaceous dominants.

Dry Meadow (45120): 16 acres (7 ha). Several dry meadows are scattered on shallow soils. These are dominated by *Astragalus bolanderi*, with other species such as *Lupinus andersonii* locally common. They may be invaded by conifers, but many of the meadow borders are sharp and apparently stable.

Subalpine Fir-Pine Woodland (85210): 9 acres (4 ha). On the highest summit areas the open fir forest-brush association merges into a rocky situation with a discontinuous understory of *Arctostaphylos nevadensis* and several rock-outcrop herbs such as *Allium campanulatum*, *Hieracium horridum*, *Pellaea bridgesii*, *Sedum* sp., and *Stipa elmeri*. The scattered trees include red fir, Jeffrey pine, and western white pine (*Pinus monticola*).

Forest-Meadow Lodgepole Pine Ecotone (86100): 8 acres (3 ha). A sporadic fringe of lodgepole pine (*Pinus contorta* ssp. *murrayana*) exists along meadow margins. This association is not well developed in the study area, but becomes more extensive at slightly higher adjacent elevations.

Riparian (63500): No acreage is given. This association is mapped but not discussed in the report. Several species are listed as riparian. These include *Agastache urticifolia*, *Aquilegia formosa*, *Athyrium felix-femina* var. *californicum*, *Epilobium angustifolium*, *Equisetum* sp., *Heracleum lanatum*, *Ledum glandulosum* var. *californicum*, *Lilium* sp., *Parnassia* sp., *Polygonum bistortoides*, *Salix* spp., and *Senecio triangularis*.

Plant Diversity

One hundred twelve taxa are given in a partial list (many meadow species not identified).

Conflicting impacts

Light cattle grazing in the meadows is mentioned. This candidate has been dropped because the current policy of the Pacific Southwest Region is not to establish RNAs within experimental forests.