

### Dry Mixed Conifer (TERR-DMC-DC)

- 01 At the landscape scale, the dry mixed conifer vegetation type (**Error! Reference source not found.**) has a mosaic of patches of trees of varied sizes and ages. It is dominated by ponderosa pine and Jeffrey pine trees, with varying amounts of white fir, red fir, incense cedar or sugar pine. Sun-loving and fire-adapted native shrubs and plants are common.
- 02 Fire occurs as a key ecological process in fire-adapted ecosystems where it does not pose an unacceptable risk to life and property. Fire as an ecological process creates, restores, and maintains ecosystem resilience and increases understory plant vigor, heterogeneity, and habitat diversity.
- 03 At the landscape scale, areas dominated by medium and large diameter trees comprise more than 60 percent of the landscape. Overstory tree canopy cover is generally 30 percent but ranges widely from 10 to 60 percent at a fine-scale. When black oak dominates the overstory, because of their wide crowns, canopy cover can be greater than 50 percent. Trees are denser in some locations, such as north-facing slopes and canyon bottoms, but in small patches, in limited areas (less than 30 percent of the area). Large and old trees are common in much of the landscape in varying densities (see old forest section below) in all seral stages. Trees greater than 30 and 40 inches in diameter are common, especially pine and black oak. Some trees exceeding 50 inches in diameter occur on more productive sites. These areas are highly resilient to fire (see TERR-MONT-DC-05).
- 04 At the mid- to fine- scale, vegetation within patches is highly variable (Table 2). Trees of different sizes and ages, variably spaced, comprise an irregular, uneven-aged forest. Individual trees are variably spaced with some denser groups. Tree stocking (basal area) is highly variable, ranging from 20 to 200 square feet per acre, with most areas having fewer than 150 square feet per acre. Numbers of seedlings and saplings are sufficient to replace old trees over time, but since ponderosa pine is shade-intolerant, they are very patchy in distribution with regeneration occurring when gaps and openings of sufficient size are created.
- 05 At the mid- to fine- scale, small irregularly shaped openings with less than 10 percent tree cover make up from 10 to 50 percent of the area, and contain a mix of grasses, herbaceous plants and shrubs. Vigorous shrubs cover 10 to 60 percent of the area. Less than 30 percent of shrubs are decadent with many dead branches.
- 06 At the mid- to fine-scale, large snags greater than 20 inches in diameter are at densities of 2 to 40 snags per 10 acres (Table 3), and are well distributed, but highly irregular in spacing providing for future downed logs. Coarse woody debris, including large downed logs in varying states of decay, is irregularly distributed and ranges from 1 to 510 tons per acre. Litter and surface fuel is patchy with fewer than 5 to 10 tons per acre in fuel loading on average over 30 to 70 percent of the area. There are some small areas of up to 30 tons per acre and others with fewer than 5 tons per acre.



**Figure 6. Dry mixed conifer forest**

### Moist Mixed Conifer (TERR-MMC-DC)

- 01 At the landscape scale, varying mixtures of Jeffrey or ponderosa pine, white fir, red fir, incense cedar and sugar pine trees occur. Native shrubs and plants are common in the understory.
- 02 At the landscape scale, the moist mixed conifer type has a mosaic of patches of trees of varied sizes and ages, with more small patches of moderate and high canopy cover than in drier parts of the landscape. Areas dominated by medium and large diameter trees comprise more than 50 percent of the landscape. Overstory tree canopy cover is highly variable, ranging from 20 to 90 percent but with a median of 60 percent.
- 03 At the landscape scale, closed-canopied patches are resilient to high intensity fire when they are embedded in larger areas dominated by highly resilient, open forests. These close-canopied patches are comprised of a combination of mid-story and understory tree and shrub density, and patchy, light to moderate surface fuels. Early seral vegetation, shrubs, grasses, herbs, tree seedlings or saplings mostly occur in very small areas, intermixed within forest stands or patches. Large and old trees are common in much of the landscape in varying densities (see old forest section below) in all seral stages. Trees greater than 30 and 40 inch diameter are common. Some trees exceeding 50 inches in diameter occur on more productive sites.
- 04 At the mid- to fine- scale, moist mixed conifer patches are diverse, with high variation in density and spacing. Trees of different sizes and ages, variably spaced, comprise an irregular, uneven-aged forest with all seral stages present, including old forest. Individual trees are variably spaced with some tight groups. Tree stocking (basal area) is highly

variable, ranging from 50 to 300 square feet per acre (Table 2) with most areas having fewer than 200 square feet per acre. Seedlings and saplings are sufficient to replace old trees over time, but are not uniformly distributed in stands. These areas are moderately to highly resilient to fire, when surrounded by large areas of highly resilient forests.

- 05 At the mid- to fine- scale, large snags greater than 20 inches in diameter are patchily distributed, averaging 5 to 60 snags per 10 acres (Table 3) providing for future downed logs. Coarse woody debris, including large downed logs in varying states of decay, is patchily distributed and averages fewer than 5 tons per acre. In patches centered on areas of past tree mortality, coarse woody debris can be up to 10 tons per acre. Litter and surface fuel is patchy, with fewer than 5 to 15 tons per acre in fuel loading on average over 30 to 70 percent of the area.
- 06 At the fine scale, irregularly-shaped groups of trees and widely-spaced trees are variably spaced with some tight clumps. Vigorous shrubs cover varies from 10 to 90 percent of the area. Openings with less than 10 percent tree cover are in various shapes and intermixed with groups of trees. These openings make up 10-30 percent of the area, are typically less 0.75 acres in size, and contain a mix of grasses, forbs, and shrubs.
- 07 Fire occurs as a key ecological process in fire-adapted ecosystems where it does not pose an unacceptable risk to life and property. Fire as an ecological process creates, restores, and maintains ecosystem resilience and increases understory plant vigor, heterogeneity, and habitat diversity.

#### All Upper Montane Vegetation Types (TERR-UPPR-DC)

- 01 At the landscape scale, the upper montane landscape is a heterogeneous mosaic of patches of red fir forests, lodgepole pine patches, Jeffrey pine woodlands, meadows and montane chaparral. Upper montane vegetation occurs in a complex mosaic of different densities, sizes, and species mixes across large landscapes that vary with topography, soils and snow accumulation. The composition, structure, and functions of vegetation make them resilient to fire, drought, insects and pathogens, and climate change. The mix of seral stage patches, and open versus closed canopied areas, varies by forest type as described in Table 4. Large and old trees are common in most seral stages throughout the landscape and in varying densities (see old forest section below).
- 02 At the landscape scale, fire is a key ecological process, restoring and maintaining patchy fuel loads and increasing heterogeneity and understory plant vigor. Fires occur irregularly, generally every 15 to 100 years, with frequency averaging about 40 years. Fires in this vegetation type burn with low, moderate or mixed severity, with minimal patches of very high severity (greater than 90 percent basal area mortality), rarely greater than 300 acres in size. The proportion of areas burned at high severity within a fire is generally less than 10 to 15 percent. Due to existing high levels of fuels and weather variability, greater proportions of areas of high severity burn (up to 50 percent) may be unavoidable during large landscape prescribed fires or wildfires managed to meet resource objectives. Some patches of high severity burn reach 1,000 acres in size.
- 03 At the landscape scale, white pines (sugar pine, western white pine, and whitebark pine) are healthy and vigorous with a low incidence of white pine blister rust. Individual trees and the stands they occur in are resilient to moisture stress, drought and bark beetles. White pine blister rust-resistant trees are regenerating and populations are sustained.

**Table 4. Amount of seral stage patches (>10 acre) by vegetation type at the landscape scale (tens of thousands of acres)**

Vegetation Type/Zone	Early Seral <sup>1</sup>	Small Tree <sup>2</sup>	Open mature forest <sup>3</sup>	Intermediate mature forest <sup>4</sup>	Dense mature forest <sup>5</sup>
Jeffrey Pine	5–20%	1–10%	60–90%	10–20%	<10%
Red Fir	5–20%	2–15%	20–70%	20–70%	10–40%
Wet Lodgepole Pine	5–20%	2–15%	5–20%	20–70%	20–70%
Dry Lodgepole Pine	5–20%	2–15%	50–80%	10–30%	0–30%

<sup>1</sup>Shrub, grass/herb, tree seedlings and saplings.

<sup>2</sup>California wildlife habitat relationship (CWHR) tree size classes 2 & 3.

<sup>3</sup>CWHR 4 & 5; 10–40% tree cover.

<sup>4</sup>CWHR 4 & 5; 40–60% tree cover.

<sup>5</sup>CWHR 4, 5, & 6, >60% tree cover.

**Table 5. Structure within forested patches (10s to 100s of acre areas with similar forest)**

Vegetation Type/Zone	Basal Area (square feet per acre)	Tree Canopy Cover (percent cover overhead)	Shrubs
Jeffrey Pine	20–200; mostly < 150	10–40; may exceed 40% in small patches	0–70% cover; variable, mixed ages
Red Fir	50–300; mostly < 200	20–75; median 40; highly variable	0–70% cover, variable, mixed ages
Wet Lodgepole pine	100–280; mostly < 200	20–70; generally 40 to 60%	0–70% cover, variable, mixed ages
Dry Lodgepole pine	20–200; mostly around 120	10–40; may exceed 40% in small patches	0–70% cover, variable, mixed ages

### Red Fir (TERR-RFIR-DC)

- 01 At the landscape scale, the red fir forest type (Figure 7) is part of a heterogeneous mosaic of tree species and vegetation structures (e.g., tree density, size, age and shrub cover), with patches of Jeffrey pine, meadows and montane chaparral. It is dominated by red fir trees, with varying amounts of white fir, Jeffrey pine, western white pine, sugar pine, lodgepole pine and mountain hemlock.
- 02 Fire occurs as a key ecological process in fire-adapted ecosystems where it does not pose an unacceptable risk to life and property. Fire as an ecological process creates, restores, and maintains ecosystem resilience and increases understory plant vigor, heterogeneity, and habitat diversity.
- 03 At the landscape scale, areas dominated by medium and large diameter trees and moderate canopy cover (between 40 and 60 percent) comprise most of the landscape (Table 4). Trees are denser in some locations such as north-facing slopes and canyon bottoms, near meadows or where snow accumulates. Areas with closed canopy cover exceeding 60 percent occur on 20 percent of the landscape, but can range from 10 to 40 percent depending on the distribution of deeper soils and available soil water. Early seral vegetation, shrubs, grasses, herbaceous plants, tree seedlings or saplings, mostly occur in very small areas, intermixed within forest stands or patches.
- 04 At the landscape scale, shrubs, grasses and young trees grow in patches of high tree mortality with abundant snags and large logs, providing complex early seral habitat.
- 05 At the mid- to fine-scale, trees of different sizes and ages, variably spaced, comprise an irregular, uneven-aged forest. Individual trees are variably spaced with some tight groups. Tree stocking (basal area) is highly variable, ranging from 50 to 300 square feet per acre with most areas having fewer than 200 square feet per acre (Table 5). Numbers of seedlings and saplings are sufficient to replace old trees as they die, but are very patchy in distribution.
- 06 At the mid- to fine-scale, small openings are intermixed within stands of trees. They make up 5 to 20 percent of the area within tree stands, have less than 10 percent tree cover, are irregularly shaped, and often contain herbaceous plants, shrubs, and tree seedlings and saplings. Vigorous shrub cover is highly variable (Table 5), covering 5 to 70 percent of the area, though some soil types do not support shrubs. Some openings and the understory of some red fir patches have little to no understory plants but instead have a high diversity of mushrooms and other fungi.
- 07 At the mid- to fine-scale, snags greater than 20 inches in diameter are patchily distributed. An average of 5 to 40 snags per 10 acres provide for future downed logs (Table 6). Coarse woody debris, including large downed logs in varying states of decay, is patchily distributed and ranges from 1 to 10 tons per acre. Litter and surface fuel is patchy with fewer than 5 to 20 tons per acre in fuel loading on average. There may be areas with no fuels and pockets of high fuel accumulation scattered irregularly.



**Table 6. Snags and large logs at landscape scale in low to moderate severity burn patches**

Vegetation Type/Zone	Snags > 20 inches diameter per 10 acres	Snags > 30 inches diameter per 10 acres	Logs (>15" diameter and >8 feet long) tons per acre	Litter and Understory dead wood (tons per acre)
Jeffrey Pine	2–40	--	1–10, all decay classes	3–10; patchy
Red Fir	5–40	1–10	1–10, all decay classes	5–20, patchy
Wet Lodgepole Pine	5–40	--	1–20, all decay classes	5–30, patchy
Dry Lodgepole Pine	2–25	--	1–10, all decay classes	2–10; patchy



**Figure 7. Three photos displaying red fir forest heterogeneity**

**Lodgepole Pine (TERR-LDGP-DC)**

This vegetation type is divided into dry lodgepole pine versus wet lodgepole pine. Dry lodgepole pine dominates on upper montane dry sites generally above 8,500 feet elevation, often located on benches, upper topographic positions, and moderate slopes. Stands are typically in broken terrain and shallow, drier, and nutrient-poor soils. Western white pine may be present, but mesic tree