

21. Crater Creek (Keeler-Wolf 1987b)

Location

This candidate RNA is on the Klamath National Forest, Siskiyou County. It is about 16 miles (26 km) NW. of Mount Shasta City. It occupies portions of sections 18 T41N, R6W and 13 T41N, R7W MDBM (41°24'N., 122°35'W.), USGS China Mtn. quad (fig. 43). Ecological subsection – Upper Scott Mountains (M261Aj).

Target Elements

Curl-Leaf Mountain Mahogany (*Cercocarpus ledifolius*) and California Mixed Subalpine Forest

Distinctive Features

Dense and Diverse Subalpine Forest: The high density and basal area cover of the Crater Creek subalpine forest are exceptional. Other measurements of subalpine forests in California over relatively large areas have not approached these figures (e.g., Sugar Creek candidate RNA and Whippoorwill Flat RNA). These may be the most productive subalpine forests in the State. Trees are typically not only dense but also relatively tall and well-formed. In addition, these subalpine forests may be the most diverse in the State, with seven regularly occurring tree species. These forests contain mixtures of all the important subalpine trees of E. Klamath Mountains. The codominance of foxtail pine (*Pinus balfouriana*), whitebark pine (*P. albicaulis*), and mountain hemlock (*Tsuga mertensiana*) in certain stands is unique.

Curl-Leaf Mountain Mahogany Vegetation: This area displays an excellent array of curl-leaf mountain mahogany (further known as, simply, mountain mahogany) vegetation types with respect to variations in slope exposure, steepness, parent material, and elevation. Although mountain mahogany associations are widespread in the W. United States, little is known about their successional relationships and ecological position relative to adjacent vegetation types. Many gaps in the knowledge of the species could be answered at this site.

Rare Flora: Three members of CNPS List 4 (*Allium siskiyouense*, *Lomatium engelmannii*, and *Eriogonum siskiyouense*) occur in the area. Because of the early date of survey (late May), several other rare species known from the vicinity may have been overlooked.

Physical Characteristics

The study area covers about 550 acres (223 ha). Elevations within the area surveyed range from approximately 5760 to 8420 ft (1756-2566 m). The site occupies the S.-facing slopes of a major spur ridge of the Scott Mountains crest as well as the W. side of a portion of the main crest itself, stretching for about 1.5 miles (2.4 km) N. of China Mountain. In addition to the predominantly S.-facing exposures on the spur ridge, areas of N., NW., W., and SE. exposures also occur on the 300-acre (121-ha) addition. Slopes are moderate to steep throughout. The principal rock type is gabbro of the Trinity ultramafic pluton, with the W. portion of the area underlain by serpentinitized peridotite. Soils are typically shallow, rocky, and poorly developed. However, soil derived from the peridotite tends to be less rocky, less fertile, and more clay-rich than the gabbroic soils. Precipitation

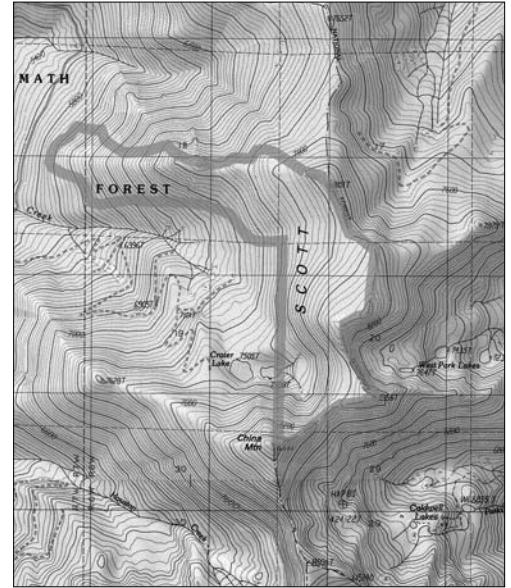


Figure 43—Crater Creek cRNA

is estimated at 40-60 inches (1016-1525 mm) annually, with estimated mean January minima of -10 °F (-23 °C) at the upper elevations and mean July maxima about 90 °F (32 °C) at the lowest elevations.

Association Types

Ten 100-m² plots each were sampled in the mountain mahogany and subalpine forest associations.

Subalpine Forest (86210, 86220, 86300, 86600): 305 acres (123 ha). The diverse subalpine forest above 7600 ft (2317 m) shows clinal variation with respect to exposure. Four main subtypes are identifiable.

Subtype 1. The foxtail pine subalpine forest (46 acres, 19 ha) is the most highly insulated subtype, occurring on S.- to SW.-facing exposures at lowest elevations. It is dominated by foxtail pine with lesser numbers of mountain mahogany, red fir, and lodgepole, western white, and whitebark pines. It is an open forest with relatively deep, rocky soil. Reproduction is scattered in openings and dominated by foxtail pine and red fir. The understory is similar to the adjacent mountain mahogany woodland (subtype 3). As with other subalpine trees at Crater Creek, the foxtail pines are not particularly old. Five trees 27-35 inches (69-89 cm) dbh were between 370 and 435 years old. The largest foxtail pines in this type are 44-48 inches (1.1-1.2 m) dbh and are probably 600-700 years old.

Subtype 2. The mixed subalpine forest (108 acres, 44 ha) lies on mostly W.-facing exposures above the previous subtype. It is denser than subtype 1, with the deletion of mountain mahogany and many of its associated understory species. Foxtail and whitebark pines are codominants with western white pine, lodgepole pine, and red fir as relatively minor components. Heights of dominant whitebark and foxtail pines are typically between 66 and 82 ft (20-25 m). The tall whitebark pines are particularly noteworthy (fig. 44).

Subtype 3. The mountain hemlock subalpine forest (117 acres, 47 ha) occurs at higher elevations and on more NW.-facing slopes than the previous subtypes. This is the densest form of subalpine forest, characterized by the addition and regular dominance of mountain hemlock. Whitebark pine remains an important subdominant and occasional codominant, but foxtail pine becomes rare, as do the other tree species associated with previous subtypes.

Subtype 4. The whitebark pine subalpine forest (34 acres, 14 ha) is the highest and most exposed of the subalpine types. It occurs on the summit ridge above 8200 ft (2500 m) and is dominated by semikrummholz whitebark pine. Mountain mahogany again becomes the most important subdominant, as it is in the open forests of subtype 1. Foxtail pine is scattered on deeper soil within this ridgetop type.

The sample plots are concentrated within the first two subtypes. Of the seven tree species in the sample, whitebark pine dominates (basal area cover 37 m²/ha, density 660/ha, frequency 90 percent), followed by foxtail pine (basal area cover 32 m²/ha, density 130/ha, frequency 70 percent).

Figure 44—Crater Creek, dense mixed subalpine forest with foxtail pine, whitebark pine and mountain hemlock. (1986)



The other species in order of importance are red fir, mountain mahogany, mountain hemlock, western white pine, and lodgepole pine. Total basal area cover is about 80 m²/ha, and total density is 1150/ha.

Mountain Mahogany (no Holland equivalent): 240 acres (97 ha). This type may be broken into three subtypes considered as a gradient ranging from open shrub-steppe on the lowest, driest, most highly serpentinized areas, through a taller dwarf woodland or scrub in rocky gabbroic areas at mid-elevations, to a woodland on deeper gabbroic soil with scattered trees of several species of conifers at high elevations.

Subtype 1. The serpentinite shrub-steppe (82 acres, 33 ha) has the lowest cover of the three types. It is restricted to the serpentinite belt on the W. side of the area, ranging from 5760 to 6880 ft (1756-2097 m). Slopes are relatively steep (30-45°) with xeric W. to SW. exposures. The area is dominated by low (4- to 6-ft, 1.2- to 1.8-m) mountain mahogany with large grass- and herb-dominated patches intervening. Average shrub density on two 100-m² plots is 900/ha, and average shrub cover is 27 percent. Density of mountain mahogany saplings and seedlings averages 130/ha. The dominant herbs and grasses include *Festuca idahoensis*, *Elymus glaucus*, *Phlox diffusa*, and *Poa pringlei*. Species apparently restricted to this subtype include *Sedum lanceolatum*, *Arenaria congesta*, *Allium siskiyouensis*, *Cryptantha affinis*, *Phacelia linearis*, and *Eriogonum siskiyouensis*.

Subtype 2. The rocky gabbro scrub (98 acres, 40 ha) occurs at elevations between 6800 and 7500 ft (2073-2286 m). Stature of mountain mahogany increases, grass cover decreases, and additional small shrubs increase compared to the previous subtype. Gabbro boulders cover 40-50 percent of the ground. On four 100-m² plots, the stem cover for mountain mahogany averages 9 m²/ha whereas shrub density (not stem density) averages 575/ha. Other shrubs on the four plots include *Symphoricarpos vaccinoides*, *Berberis pumila*, *Amelanchier pallida*, *Ceanothus prostratus*, *Prunus virginiana* var. *demissa*, *P. emarginata*, and *Arctostaphylos patula*. Herbs and grasses are sparse in cover, but they are represented by 25 species on the four sample plots. These include *Viola purpurea*, *Achillea lanulosa*, *Monardella odoratissima* ssp. *pallida*, *Hackelia jessicae*, and *Senecio integerrimus*.

Subtype 3. The mixed mountain mahogany woodland (60 acres, 24 ha) occurs on gentle S. to SW. exposures with deep, relatively unrocky soil. Mountain mahogany attains its greatest size in this type, which ranges between 7200 and 7760 ft (2195-2365 m) in the SE. quarter of section 18 and the adjacent part of sect. 19. Tree-size individuals of mountain mahogany up to 20 inches (51 cm) dbh and 25 ft (7.6 m) tall are interspersed with scattered trees of foxtail pine, whitebark pine, western white pine (*Pinus monticola*), Jeffrey pine (*P. jeffreyi*), lodgepole pine (*P. contorta* ssp. *murrayana*), white fir (*Abies concolor*), and Shasta red fir (*A. magnifica* var. *shastensis*).

Only one of the four 100-m² plots is clearly dominated by mountain mahogany, whereas two are marginally dominated by foxtail pine with mountain mahogany as the major subdominant, and the other plot is dominated by Jeffrey pine. On all four plots, mountain mahogany stems outnumber all trees, with an average density of 1300/ha (range 300-2600/ha). Some mountain mahoganies are single-stemmed, but most have 3-6 basal stems. Reproduction of mountain mahogany is better than in other subtypes, with seedlings or saplings occurring on 75 percent of the plots and averaging 1000/ha.

Artemisia tridentata is characteristic and conspicuous in many areas as the major low shrub (12-25 percent cover). Eight other species of shrubs occur in this subtype, including *Ceanothus prostratus* (12-35 percent cover), *Symphoricarpos vaccinoides* (2-10 percent cover), and *Ribes binominatum*. Herbs and grasses are more conspicuous (26 species) on this type than the rocky

gabbro subtype. This subtype is clearly ecotonal with subalpine forest and shows that mountain mahogany is limited by competition to poorer sites where conifers cannot dominate.

Plant Diversity

One hundred two taxa are listed.

Conflicting Impacts

A recent selective logging operation encroaches on the lower elevations of the proposed area, although it does not appear to have affected any of the major vegetation types within the proposed boundaries.