

35. Hale Ridge (Keeler-Wolf 1987c, Johnson 1995)

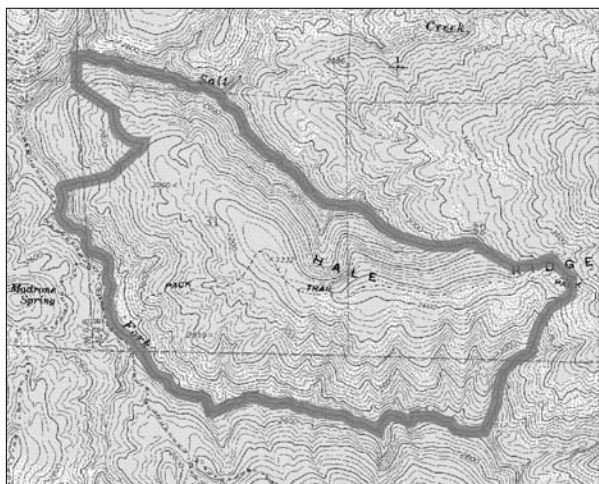


Figure 72—Hale Ridge RNA

Location

This established RNA is on the Mendocino National Forest about 10 miles (16 km) NE. of Upper Lake. It lies within portions of sects. 30, 31, and 32 T17N, R8W; sect. 36 of T17N, R9W; and sects. 5 and 6 of T16N, R8W MDBM (39°15'N., 122°48'W.), USGS Potato Hill quad (fig. 72). Ecological subsections – Eastern Franciscan (M261Ba) and Central Franciscan (M261Bb).

Target Element

Knobcone Pine (*Pinus attenuata*)

Distinctive Features

Knobcone Pine Woodland: The local Lake County stands are among the best developed in the species' range and the most extensive off ultramafic soils. The ecology of this species remains relatively unknown, particularly in the realm of vegetation ecology and soil/parent material relationships. Questions regarding effectiveness of post-fire reseeding, wind-dispersal effectiveness onto nonburned areas, and growth rates on differing exposures could be answered here in conjunction with a program of prescribed burning. The presence of large areas of adjacent and intermixed chaparral and Douglas-fir (*Pseudotsuga menziesii*)-dominated vegetation provides a typical context in which to view the successional patterns of the knobcone pine woodland (fig. 73).

Serpentinite Indicator Species not on Serpentinite: Certain species such as the leather oak (*Quercus durata*), commonly considered as being highly restricted to serpentine soils (Kruckeberg 1984), are locally common in the RNA where no serpentine soil occurs. In addition, a number of other species considered by Kruckeberg as local or regional indicators of serpentine soils also occur in the study area: *Arctostaphylos stanfordiana*, *A. glandulosa*, *Castilleja foliolosa*, *Chaenactis glabriscula*, *Eriophyllum lanatum*, *Galium ambiguum*, *Phacelia imbricata*, and knobcone pine. Perhaps the generally poor, infertile soils of Franciscan graywacke form less competitive environments than typical nonserpentine soils for these species, thus allowing them to occur here.

Fire: Approximately 50 percent of the RNA was burned in December 1988, after the ecological survey. Fire in 1932 and prescribed burning (80 acres [32 ha]) in 1983 and 1984 were also recorded.

Physical Characteristics

The area covers 975 acres (395 ha). Hale Ridge is a W.-trending spur of Goat Mountain. The ridge has a relatively steep slope, but generally flat top. The Rice Fork of the Eel River and Salt Creek delimit the boundaries on the N., S., and W. Slope exposures are varied, but predominantly N.- and S.-facing. Elevations range from 2400 to 3600 ft (732-1097 m). Rocks are all Franciscan assemblage dominated by graywacke sandstone with some shale. Soils are generally shallow and infertile and include the Boomer-Hoda-Speaker, the Maymen-Etsel-Speaker, and the Speaker-Maymen-Marpa associations. Mean annual precipitation is 45-55 inches (1143-1397 mm). July maximum temperatures are 102-106 °F (39-41 °C) and January minimums are about 22 °F (-6 °C).

Association Types

Ten 10- by 10-m plots were sampled in knobcone pine forest, and six 10- by 10-m plots were sampled in the Douglas-fir dominated forest.

Knobcone Pine Woodland (83210): 380 acres (154 ha). This association may be divided into high-, moderate-, and low-density phases. All are a result of a fire which swept through the area in 1932. Basal area cover varies depending on density of the trees, from 18 m²/ha on high-density plots to 47 m²/ha on low-density plots.

High-density stands (2500-3500 knobcone pine/ha) have a NW. to NE. aspect, low cover (trees average 3 inches [8 cm] dbh), sparse shrub understory, and virtually no herbs. *Arctostaphylos canescens* and interior live oak (*Quercus wislizenii*) are the dominant shrubs. Occasional canyon live oak and Douglas-fir saplings suggest future dominance by these species.

The moderately dense phase, which occurs on WNW.- to SW.-facing slopes, averages 1600 knobcone pine/ha. The understory is well developed, dominated by *Arctostaphylos glandulosa* and interior live oak (*Quercus wislizenii*). *Toxicodendron diversilobum*, *Ceanothus lemmonii*, and *Adenostoma fasciculatum* are also characteristic. Total understory cover ranges between 25 and 80 percent. Successional stage varies from site to site. Douglas-fir forest may colonize the most mesic sites, but in general, the poor soil and xeric exposures are conducive to chaparral dominance.

The open phase, primarily on S. exposures, is characterized by low-density knobcone pine (800-1300/ha). These trees are the largest-boled individuals in the area, ranging to 13 inches (33 cm) dbh, although their heights (13-16 m) are only 2-3 m taller than average trees in denser types. A relatively dense shrub layer dominated by xerophilic species such as *Adenostoma fasciculatum*, *Arctostaphylos glandulosa*, *Pickeringia montana*, and *Quercus wislizenii* var. *frutescens* covers 35-65 percent of the surface.

Portions of the open phase have burned in several small controlled burns in recent years. Typical regenerating species do not include knobcone pine, but they do include *Adenostoma fasciculatum*, *Arctostaphylos glandulosa*, interior live oak, *Haplopappus linearifolius*, *Ceanothus lemmonii*, *Eriodictyon californicum*, and *Rhus trilobata*. Early successional herbs not otherwise noted in the type, such as *Hypericum concinnum*, *Gilia capitata*, *Lotus humistratus*, *Clarkia rhomboidea*, *Cirsium vulgare*, *Wyethia angustifolia*, and *Mentzelia dispersa*, add to the cover provided by the resprouting and seedling shrubs for a total of about 65 percent.

Douglas-Fir-Dominated Forest (84110 [84230 in the establishment record]): 320 acres (129 ha). This type is dominated by Douglas-fir with a subcanopy of scattered canyon live oak (*Quercus chrysolepis*). Substantially less important are sugar pine (*Pinus lambertiana*), incense-cedar (*Libocedrus decurrens*), knobcone pine, Pacific madrone (*Arbutus menziesii*), and ponderosa pine (*Pinus ponderosa*). Total tree density is 1410/ha, and total cover is 112 m²/ha. Dominant trees are 3-4 ft (0.9-1.2 m) dbh and 250-350 years old. Saplings and seedlings average 980/ha with canyon live oak most important, followed by Douglas-fir, sugar pine, and madrone. Cover of herbs and shrubs is low (averaging 4 percent) with no clearly dominant species (8 shrub and 12 herb and grass species recorded). This forest occurs primarily on N.-facing slopes, but may also occur in slightly different form in sheltered S.-aspect ravines.

Chaparral (37110, 37200, 37530, 37E00): 165 acres (67 ha). The chaparral may be divided into three phases: mixed, chamise, and mechanically disturbed successional. The mixed phase is most extensive. It varies from 60 to 100 percent cover of such species as *Arctostaphylos glandulosa*, *A. canescens*, *A. stanfordiana*, *Adenostoma fasciculatum*, *Ceanothus cuneatus*, *Pickeringia montana*, *Quercus durata*, *Q. wislizenii* var. *frutescens*, *Lonicera interrupta*, *Cercocarpus betuloides*, and *Garrya*

fremontii. Herbs are rare. A few young foothill pine (*Pinus sabiniana*) occur. This phase has the greatest potential for longevity and productivity with the lowest fire frequency. It typically occupies relatively mesic sites on SW-, SE- and even locally N.-facing slopes.

Chamise chaparral is most xerophilic of the three types. It occupies the driest S.-facing slopes with shallow, rocky soils. It has low species diversity, with *Adenostema fasciculatum* comprising 65-100 percent of the woody cover, and only occasional shrubs of *Arctostaphylos glandulosa*, *Ceanothus cuneatus*, or *Pickeringia montana*. Herbs are rare, except on portions that were recently control-burned, where herbs are similar to those previously noted in knobcone pine burns. Areas with annual grass-dominated openings between shrubs are senescent.

Unclassified: 11 acres (4.5 ha). This is a mechanically disturbed chaparral area, occupying the periodically cleared fire trail. On most sites *Ceanothus integerrimus*, *C. cuneatus*, and *C. lemmonii* dominate along with *Pickeringia* and *Adenostoma*. This is the tallest form of chaparral, reaching 15-20 ft (4.6-6.1 m). Successional trends vary depending on slope exposure. Mesic N.-facing slopes have been invaded by Douglas-fir and young knobcone pine; on SW. slopes chaparral species from surrounding mixed types are the only species in evidence.

Plant Diversity

One hundred four taxa are listed.

Conflicting Impacts

Because the knobcone pine woodland is fire dependent, the vegetation is likely to require management through controlled burning. Impacts include light off-road vehicle use along the existing fuel break through the center of the RNA and erosion (gullying) on the steeper portions of the fuel break.



Figure 73—Hale Ridge, view south from the eastern edge of the Hale Ridge RNA across mixed chaparral and open phase of knobcone pine woodland. (1987)