

46. Iron Mountain (Graham Pinery) (Keeler-Wolf 1992)

Location

The ecological survey area was a candidate RNA, but now it is part of the proposed Iron Mountain RNA, the boundary of which has not yet been determined. The Graham Pinery study area is on the Lassen National Forest, Tehama County, about 23 miles (37 km) NE. of Chico. It occupies portions of sects. 32, 33, and 34 T26N, R2E and sects. 3 and 4 T25N, R2E MDBM (40°03'N., 121°45'W.), USGS Ishi Caves and Butte Meadows SW quads (*fig. 95*). The entire area is within the Federally-designated Ishi Wilderness. Ecological subsections – Tuscan Flows (M261Fa) and Shingletown-Paradise (M261DI).

Unless otherwise noted, the following descriptions applied to the Graham Pinery area only in May 1990 when the fieldwork of the ecological survey was conducted; they do not fully represent conditions at present.

Target Elements

Pacific Ponderosa Pine (*Pinus ponderosa*) and California Black Oak (*Quercus kelloggii*)

Distinctive Features

Fir History: A major fire, Campbell Fire, occurred in early August 1990, after the fieldwork of the ecological survey was completed. Field reconnaissance was made after the fire and reported in the ecological survey, providing valuable pre-fire and post-fire vegetation information. Before the Campbell Fire of 1990, the last fire to affect the area occurred in 1931.

Ponderosa Pine: The pinery, which refers to the pure ponderosa pine stand in the area (*fig. 96*), is near the low-elevation extreme of the Pacific ponderosa pine belt in this part of the Cascades. Compared to other RNAs in the region designated to represent the ponderosa pine association, this area represents the lower-elevation W.-side phase. Until early August 1990, the ponderosa pine core area was dominated by large, 200- to 400-year-old pines up to 54 inches (137 cm) dbh and 145 ft (44.2 m) tall. The 1990 fire, which affected nearly the entire area, killed most of the pines. The current value of the ponderosa pine component at this site is not as a well-developed example of the forest type, but as a natural laboratory of post-fire regeneration and succession.

California Black Oak: At Graham Pinery, extensive stands of oak with variable structure and understory composition cover large areas on the periphery of the ponderosa pine-dominated core. Until 1990 they were a far better representation of the black oak series than the small stands at other locations in the Southern Cascades ecological section. The 1990 fire burned almost all the big black oaks. Resprouting from the root crown was observed.

Biogeographic Significance: This area contains a large number of plant and animal species characteristic of both foothill and montane locations. Many plant species characteristic of montane elevations are associated with the interior portion of the pinery in the ponderosa pine stands. Low-elevation foothill species of plants are typical associates of the chaparral stands fringing the

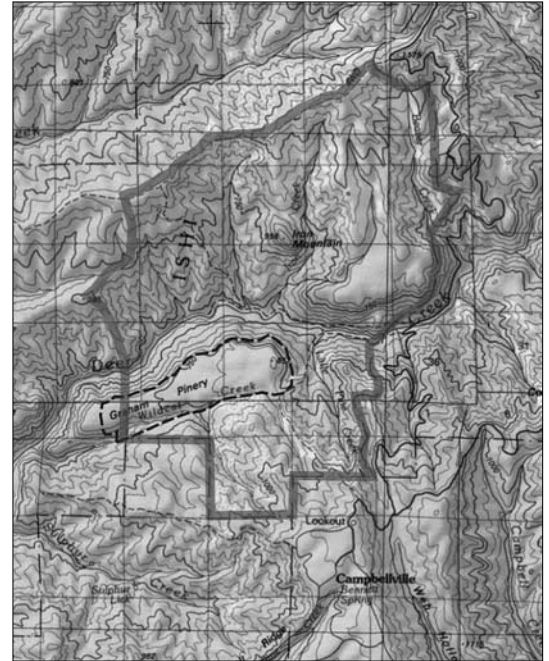


Figure 95—Iron Mountain pRNA

Dashed line = Ecological study area
Solid gray line = RNA Boundary

pinery. In addition to mixing of species from lower and higher elevations, this area also is situated at the N. extreme range of a group of plants typical of the Sierra Nevada foothills.

Rare Plants: Two rare species are found in the area. *Balsamorhiza macrolepis*, a plant characteristic of the foothill grasslands and woodlands of lower elevations, is on CNPS List 1B, while the recently described *Calystegia atriplicifolia* ssp. *buttensis* appears on CNPS List 3.

Physical Characteristics:

The study area covers 705 acres (285 ha). The Graham Pinery is a remnant of a volcanic peneplain perched along the S. rim of Deer Creek Canyon in the SW. portion of the Southern Cascades ecological section. The entire area is underlain by a series of Tertiary volcanic pyroclastic flows of the Tuscan formation whose source is thought to be two Pliocene volcanoes that no longer exist. The relatively flat tops of these remnant peneplains contrast sharply with the deeply eroded, steep slopes of the canyons that now cover most of the area.

Soils of the main part of the area are all one mapping unit, the Cohasset Gravelly Loam, 10-30 percent slopes. This soil includes small areas of Aiken, Guenoc, and Supan soils. A narrow rim of Guenocstony loam also occurs around much of the pinery and is substantially shallower than Cohasset gravelly loam. Other peripheral soil mapping units are rock outcrop, rubble land, and small slivers of Iron Mountain rocky sandy loam.

Annual precipitation averages 30-40 inches (762-1016 mm). Precipitation is mostly in the form of rain falling between November and April. Snow falls regularly during the coldest months, but usually melts within a few days. Average annual temperature is about 53 °F (11.9 °C). The area lacks a permanent source of water.

Association Types

Vegetation was sampled with ten 10- by 10-m plots in the black oak forest and woodland and fifteen 20- by 20-m plots in the ponderosa pine forest to determine density, frequency,

and basal area of the two tree species. Frequency and mean percent cover are determined for herbs and shrubs. Sampling was completed several months before the August 1990 Campbell fire.

Ponderosa Pine (84210): 223 acres (90 ha). Occupying the center of the area, the core of the pinery was vegetated with a mix of ponderosa pine, small shrub-dominated openings, and multi- and single-stemmed California black oak.

Although ponderosa pine clearly dominated the core area, it occurred in open, more-or-less discrete stands, not as an unbroken forest. Typically, the stands were dominated by large, old individuals, with scattered clumps of younger trees (59-100 years) and more recent reproduction on the periphery.

The shrubby openings were dominated by species typical of the conifer forest belt in the S. Cascades. These species also dominated the understory of open pine stands.



Figure 96—Iron Mountain pRNA, small opening in ponderosa pine forest in core of pinery. Dominant shrubs are *Rhamnus rubra* and *Ceanothus lemmonii*. (1990)

Several age groups of ponderosa pines were present. The youngest were seedlings and saplings, recently germinated in small openings adjacent to or within open stands of larger trees. These were rare and would not have been expected to restock the forest under static environmental conditions. About 40 percent of all trees sampled were of pole size, with dbh from 1 to 10 inches (2.5-25.4 cm); most of them were germinated in the previous 60 years. Another 10 percent were larger young trees, also germinated after the 1931 fire, but under uncrowded conditions and in areas of relatively deep soil. These 50- to 59-year-old, fast growing ponderosa pines attained diameters of 22-24 inches (56-61 cm) and heights of about 80 ft (24 m). The other 50 percent of sampled trees were older than 59 years. Within this group, several age groups were represented. The youngest ones were 110-120 years old (i.e., 50-60 years old when the 1931 fire occurred). Only a few were detected, indicating that most were killed in that fire. A much larger group was represented by trees between 160 and 165 years old. They varied in size from 21 to 36 inches (53-91 cm) dbh and were 100-120 ft (31-37 m) tall. The oldest were 200-400 years old. As a rule they did not exceed the 160- to 165-year-old group in height, but they were significantly larger in diameter.

Although ponderosa pine and black oak were nearly equal in density in the sample, ponderosa pine covered over four times the basal area of black oak. The understory of the open ponderosa pine stands was of similar composition to the black oak understory, although higher in species number and cover of several species. The most important understory species were *Rhamnus rubra*, *Ceanothus lemmonii*, *Stipa lemmonii*, and *Berberis dictyota*.

In the 1990 fire, mortality of ponderosa pine, particularly large, thick-barked trees, was surprisingly high. In general, the pines on the S. side of the area survived less well than those on the N. side. The presence of large, ancient pine snags in areas dominated by black oak suggests that the extent of ponderosa pine was once greater than when the area was sampled.

Black Oak Forest and Woodland (71120, 81340): 338 acres (137 ha). California black oak covered the largest portion of the study area, forming an irregular band around the central area dominated by ponderosa pine as well as small islands within it. Before the 1990 fire, most of the black oak forest was made up of even-aged sprouts resulting from the 1931 fire. The sprout forest was generally dense with canopy cover between 65 and 70 percent. Canopy height varied between 35 and 50 ft (10.6-15.4 m), and stems averaged about 7 inches (17.8 cm) dbh.

Beneath the uniform canopy of the virtually level or gently SW.-sloping summit of the pinery was a sparse, mixed understory. Dominants consisted of scattered small shrubs of *Rhamnus rubra*, *Toxicodendron diversilobum*, and *Berberis dictyota*, along with herbs such as *Carex multicaulis*, *Stipa lemmonii*, *Galium nuttallii*, and *Tauschia kelloggii*. On more mesic exposures the understory was dominated by *Toxicodendron diversilobum* accompanied by herbs characteristic of mesic environments such as *Delphinium nudicaule*, *Erysimum capitatum*, *Osmorhiza chilensis*, *Rubus ursine*, and *Lilium humboldtii*.

Throughout most of the black oak stands were occasional monarch oaks that had survived the fire of 1931. Some of these reached huge dimensions, the largest measuring 41 inches (104 cm) dbh and about 100 ft (31 m) tall. These survivors average about 4/acre (10/ha). Near the W. end of the pinery, the black oak stands become shorter and more spindly as the relatively low elevation and shallow, rocky soil combine to create a xeric setting. This type of black oak forest intergrades with chaparral dominated by *Arctostaphylos viscida* and *Quercus garryana* var. *breweri* with openings dominated by *Salvia sonomensis*.

Another type of black oak-dominated vegetation at the study area was composed of trees with stems predating the 1931 fire. This type, represented by small open stands of large black oaks, occurred within the main body of the

ponderosa pine-dominated stands in the core of the pinery. These stands averaged about 50 percent crown cover and were dominated by single-stemmed oaks from 13 to 32 inches (33-81 cm) dbh; average canopy height was 50-60 ft (15-18 m). Understory shrubs and herbs were similar to the multi-stemmed stands, with the exception of *Vulpia pacifica* and *Keckiella lemmonii* which occurred regularly but were not sampled in the multi-stemmed stands.

Chaparral (3700): The chaparral community was divided into four phases. They were:

Brewer oak (37541): 35 acres (14 ha). This type dominated large areas immediately adjacent to the multi-stemmed stands of California black oak. It was the most extensive form of chaparral in the study area before the 1990 fire. The species formed sprout thickets from 6 to 10 ft (1.8-3.1 m) tall and dominated in slightly rockier, more exposed sites than the multi-stemmed black oak dominated areas. Thickets were most common on both the N. and S. edges of the pinery where slopes range up to 30°. Occasional stands occurred on the main plateau adjacent to buck-brush and greenleaf manzanita (*Arctostaphylos patula*) stands. Brewer oak stands were burned in the 1990 fire, and basal resprouting was vigorous in most stands. Before the 1990 fire, the understory included a sparse mixture of herbs and low shrubs such as *Cynoglossum grande*, *Fritillaria* sp., *Bromus carinatus*, *Lonicera interrupta*, *Lepechinia calycina*, and *Lilium humboldtii*.

Greenleaf manzanita (37520): 18 acres (7 ha). This burl-forming species occurred largely on the edges of the pinery and was uncommon in the surrounding terrain. The most extensive stands were on the W. and N. sides of the study area immediately adjacent to the steep escarpments. The stands were variably affected by the 1990 fire. Some on the N. side barely burned at all, while stands on the W. side were subjected to a hot fire that destroyed much aboveground vegetation. Extensive resprouting occurred shortly after the fire. Before the fire, the understory of this phase was typically sparse, and scattered rocky openings frequently had mats of *Salvia sonomensis*.

Buck brush (*Ceanothus cuneatus*)/foothill pine (*Pinus sabiniana*) (37810, 71322): 25 acres (10 ha). Before the 1990 fire, *Ceanothus cuneatus* was a dominant chaparral species on much of the shallow rocky scabland soil to the E. of the pinery. The buck brush frequently associated with foothill pine and formed a matrix with a sparse, herb-dominated vegetation on the extremely rocky exposures of mudflow breccia. This vegetation type was the most xerophytic of the shrub phases, occurring on the shallowest soils in the most isolated situations. In the study area, only one small area along the E. side was dominated by this type.

Most of the scattered foothill pines were relatively young (<50 yr) and were no more than 35 ft (10.7 m) tall. Occasional shrubby California juniper (*Juniperus californica*) occurred in rocky, open areas along with scattered plants of *Arctostaphylos viscida*, *Eriodictyon californica*, and *Chrysothamnus nauseosus*. The herb-dominated openings had a sparse, although relatively diverse mixture of species including *Sidalcea hartwegii*, *Lotus humistratus*, *Allium amplexans*, *Calochortus luteus*, *Calycadenia truncata*, *Bromus rubens*, *Centaurea solstitialis*, *Arenaria douglasii*, *Chaenactis glabriuscula*, *Chorizanthe polygonoides*, *Eremocarpus setigerus*, *Penstemon azureus*, *Filago californica*, *Navarretia filicaulis*, and *Lessingia nemaclada*.

Due to the scattered, largely bare patches of vegetation, fire was spotty in this type. An opening in the NW1/4 sec. 34 atop the pinery remained largely unaffected by the 1990 fire. *Ceanothus lemmonii* and buck brush, with scattered mats of *Salvia sonomensis*, codominated in this opening.

Mesic N. slope chaparral (37E00): 18 acres (7 ha). A small portion of the chaparral on and adjacent to the N. escarpment fell in this category before the 1990 fire. There were no clear dominants. *Cercocarpus betuloides*, *Aesculus*

californica, *Ptelea crenulata*, *Fraxinus dipetala*, *Arctostaphylos patula*, *Cercis occidentalis*, *Lepechinia calycosa*, shrubby canyon live oak (*Quercus chrysolepis*), California bay (*Umbellularia californica*), and Brewer oak were all regularly occurring shrubs. The pre-1990 fire height of this type was 8-12 ft (2.4-3.7 m), taller than other chaparrals.

Canyon Live Oak Forest (81320): 48 acres (19 ha). This vegetation type dominated on the steep slopes below the pinery. Along the S. boundary it was adjacent to Wildcat Creek. This was the most mesophilic community in the area, dominated, before the 1990 fire, by largely multi-stemmed canyon live oak up to 40 ft (12 m) tall and 12 inches (31 cm) dbh. On the escarpment along the N. boundary of the study area, this was typically a closed canopy forest. California bay was a frequent subdominant. The understory included *Philadelphus lewisii*, *Torreya californica*, *Adiantum jordanii*, *Ceanothus intergerrimus*, *Cynoglossum grande*, *Dryopteris arguta*, *Erysimum capitatum*, *Galium aparine*, *Heuchera micrantha*, *Ribes roezlii*, *Trientalis latifolia*, and *Lomatium californicum*.

Despite its somewhat sheltered locations, the canyon live oak forest was largely consumed by the 1990 fire, underscoring the fire's intensity as it entered the S. side of the study area.

Plant Diversity

One hundred forty taxa are listed.

Conflicting Impacts

The relative isolation of this wilderness and the lack of water in the area minimize its attractiveness to recreational users. The pinery had been regularly used by a small number of deer hunters for many years. Before it was designated as wilderness area, this area was accessible by a primitive jeep road. The road's present condition indicates that it has not been driven upon for many years. One well-established camp site still exists on the pinery.