

## 89. Timbered Crater (Keeler-Wolf 1990f)

### Location

This area is recommended for RNA establishment (rRNA) in the forest plan. It is on the Lassen National Forest, in Siskiyou County. The area lies on the W. and lowest elevation edge of the Modoc Plateau and includes all of sects. 23 and 14 and portions of the S. halves of sects. 11 and 12 T39N, R4E MDBM (41°13'N., 121°28'W.), USGS Timbered Crater quad (fig. 177). Ecological subsection - Medicine Lake Lava Flows (M261Dh) and Big Valley Mountains (M261Gn).

### Target Element

Baker (Modoc) Cypress (*Cupressus bakeri*) and Northern Basalt Flow Vernal Pool

### Distinctive Features

**Baker Cypress:** The Baker cypress stands at this site, the type locality for the species, sprawl over thousands of acres of broken lava flows that recently filled the bottom of a broad, structural valley in the SW. part of the Modoc Plateau. These stands represent a portion of the largest population of this species in the world, covering more than 7000 acres (2833 ha). These trees appear to differ in their physical and genetic characteristics from other Baker cypress stands, most likely due to differences in climate and substrate. Portions of the Timbered Crater stands have recently burned, resulting in abundant reproduction of cypress in much of the area.

**Vernal Pools:** Two pools at the NW. corner of the site are fairly large (10-20 acres, 4-8 ha) and complex. They occupy shallow depressions surrounded by raised basalt flows, and both exhibit a diverse flora and fauna of vernal-pool-adapted species, including two species listed by the CNPS as rare or endangered. The vernal-pool habitat at the rRNA differs from typical vernal pools of the Sacramento and San Joaquin valleys and surrounding foothills. It is at a substantially higher elevation, underlain by volcanic substrate instead of sedimentary rocks, and surrounded by coniferous forest and woodland as opposed to valley grassland and foothill woodland associations. Several species reach the limits of their elevational, latitudinal, and longitudinal ranges in this vicinity. The presence of plant species endemic to the Modoc Plateau vernal pools, uncharacteristic of foothill pools, and of widespread N. species, uncharacteristic of more S., low-elevation basalt flow pools, suggests that the Modoc Plateau pools may be reasonably differentiated as a distinct community type.

**Knobcone Pine:** The knobcone pine (*Pinus attenuata*) component is vigorous and healthy and an ideal representation of the species' typical density and stand structure.

**Eastside Ponderosa Pine:** Timbered Crater provides a transitional type of interior ponderosa pine (*Pinus ponderosa*) forest, which indicates its affinity to westside ponderosa pine and other related coniferous forests of the W. slopes of the Cascades. The ponderosa pine forest here differs significantly from the higher elevational stands at nearby Blacks Mountain RNA, with their more interior mix of Great Basin species.

**Rocky Pools:** The aquatic resources at Timbered Crater are not limited to vernal pools. Another type of pool occurs in the more recent basalt flow areas. These small pools usually have rocky bottoms with little aquatic vegetation, and they occupy the bottom of collapsed lava tubes. They may retain water well into the

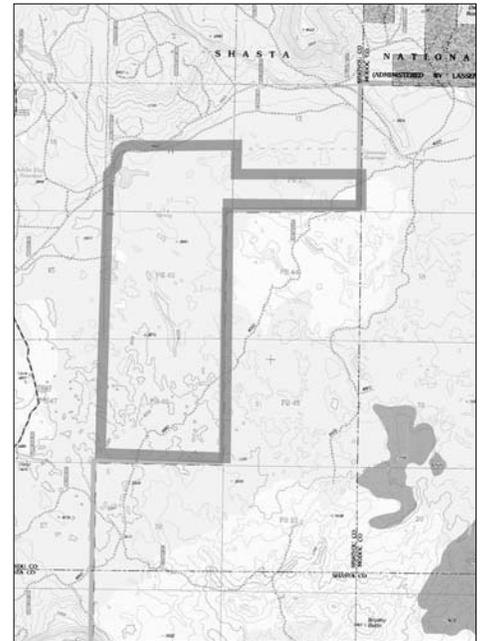


Figure 177—  
Timbered  
Crater rRNA

summer in wet years, much longer than the deepest parts of the two vernal pools. The smaller pools, despite the absence of a well-developed vascular flora, often have conspicuous invertebrate fauna, and their semi-permanence make them important watering holes for larger terrestrial vertebrates.

**Modoc Plateau Endemic Flora:** In addition to the vernal pool community, there is a unique floristic component on the xeric basalt flows of the Modoc Plateau ecological section. Several species common on the lava flows at this site are largely or completely restricted to the lava fields of this part of California and adjacent states.

**Rare Plants:** Several rare plants are known from the area. *Orcuttia tenuis* is on CNPS List 1B and *Thermopsis californica* var. *argentata* (*Thermopsis macrophylla* var. *argentata* in Hickman [1993]) is on List 4.

### **Physical Characteristics**

The rRNA covers 1777 acres (917 ha). Overall topographic relief is low, with elevations from 3520 to 3600 ft (1073-1097 m). Due to recent lava flows over much of the area, the microtopography is frequently rugged. The entire area is underlain by Quaternary volcanic rocks of either Pleistocene or recent (Holocene) origin; more specifically, they are basaltic flows that have emanated from Medicine Lake Highlands to the N. or from Brushy Butte to the S. These covered the N. floor of the Fall River Valley, a fault block structure separating the Big Valley Mountains to the E. from Soldier Mountain and other Cascade Range mountains to the W. Over a distance of several miles the valley dips gradually to the S. to the Pit River in the middle of Fall River Valley. There appear to be at least three different age groups of basalt flows in the area, although most are derived from the recent Medicine Lake flow.

Soils are divided into five mapping units: Lava Flow-Lithic Xerochrepts complex 0-35 percent slopes, lava flow, Supan family 0-15 percent slopes, Skalan-Holland families association 0-35 percent slope, and Holland-Skallan families association 0-35 percent slope.

Precipitation in the area is estimated at 25 inches (635 mm) with about 70 percent falling as snow. Unlike many other areas of cismontane N. California, this region receives about 0.25 inch (6.5 mm) or more precipitation per month even in the summer, primarily due to orographic thunderstorms associated with the relatively high elevations of the surrounding terrain. Highest temperatures usually occur in late July, and lowest temperatures are usually in early January. Mean July temperature range is 64.4-69.8 °F (18-21 °C), and January range is 26.6-32 °F (-3 to 0 °C). The frost-free period averages 120-180 days.

### **Association Types**

Ten 100-m<sup>2</sup> plots were sampled in the northern interior cypress forest and in the knobcone pine forest. The associations are listed in order of decreasing size.

**Eastside Ponderosa Pine Forest (84220):** 1044 acres (422 ha). This ponderosa pine-dominated forest occurs in two forms in the rRNA.

**Open Phase:** The more extensive, open phase occupies the older of the two recent lava flows in the N. and W. parts of the site. It is characterized by an open canopy of ponderosa pine 60-100 ft (20-30 m) high and 18-37 inches

**Figure 178—**  
**Timbered Crater,**  
picturesque Baker  
cypress with *Letharia*  
and *Bryoria* lichens fes-  
tooning branches, typi-  
cal of open stands at  
edges of lava flats in  
the Timbered Crater  
rRNA. (1989)



(46-94 cm) in diameter. Beneath this canopy is a variable, poorly developed subcanopy made up of western juniper (*Juniperus occidentalis* ssp. *occidentalis*) and Oregon white oak (*Quercus garryana*). Both species are patchy in distribution: juniper is most common on relatively level, heavily weathered surfaces; oak on rough, undulating lava. The shrub cover is relatively uniform with *Arctostaphylos patula* and *Ceanothus cordulatus* dominant and other species such as *Cercocarpus ledifolius*, *Holodiscus boursieri*, *Cercis occidentalis*, *Ceanothus integerrimus*, and *Prunus emarginata* scattered throughout.

The distributions of the three cypress family members – western juniper, incense-cedar (*Libocedrus decurrens*), and Baker cypress – are negatively correlated. Baker cypress rarely occurs on flat, well-weathered flow areas where western juniper tends to codominate with ponderosa pine. Incense-cedar typically occurs on the well-developed soils of older lava flows where juniper and cypress do not grow.

The understory of the open ponderosa pine forest is well stocked with a variety of herbs, which in a normal to wet year may cover 10-25 percent of the ground in openings between shrubs. Common species include *Lomatium nudicaule*, *L. nevadense*, *Blepharipappus scaber*, *Horkelia tridentata*, *Zigadenus paniculatus*, *Bromus tectorum*, *Festuca idahoensis*, *Poa fendleriana*, *Collinsia parviflora*, and *Linanthus bakeri*. *Lomatium dissectum* and *Chamaebatiaria millefolium* are a conspicuous presence in the rougher lava areas.

Dense Phase: A small part of the rRNA adjacent to the vernal pools has a much denser and more well-developed ponderosa pine forest. This type occurs on much older soils of the Adobe Flat area. The forest is dominated by ponderosa pine, but it also has incense-cedar and occasional sugar pine (*Pinus lambertiana*) and California black oak (*Quercus kelloggii*). It has a higher stand density and an open understory of *Ceanothus integerrimus*, *C. prostratus*, and *Arctostaphylos patula*. Herb cover is substantially different from the open stands, with such species as *Astragalus pulsiferae* var. *suskdorfii*, *Wyethia angustifolia*, *W. mollis*, *Lupinus andersonii*, and *Calystegia* sp.

**Northern Interior Cypress Forest (Baker Cypress Forest, 83220):** 560 acres (227 ha). Baker cypress at Timbered Crater occupies the young, relatively unweathered lava flows (fig. 178), except for the most rugged recent flows where fire may not be able to spread. Baker cypress tends to occur in relatively dense, pure stands and only rarely as isolated individuals. Stands may consist of a few score to many thousands of individuals. Frequently, the highest-density stands are associated with raised lava ridges. Additional stands occur occasionally on relatively flat unbroken ground where they are interspersed with patches of open eastside ponderosa pine forest or brush fields dominated by *Arctostaphylos patula*. In general, most Baker cypresses in the rRNA are producing cones at a frequency no greater than one crop every 7-10 years.

The understory is dominated by *Arctostaphylos patula*, a widespread shrub characteristic of montane chaparral throughout N. and central California. Its tolerance of dry, rocky soil and resprouting ability make it an expected understory dominant for the fire-adapted Baker Cypress, knobcone, and open ponderosa pine forests. Additional shrubs include *Purshia tridentata*, *Ceanothus cuneatus*, *C. integerrimus*, *Cercocarpus ledifolius*, *Holodiscus boursieri*, and *Cercis occidentalis*. These shrubs are a mix of montane, foothill, and transmontane vegetation elements and underscore the transitional nature of the flora.

Understory herbs are diverse, and although they rarely account for more than trace cover, several small annual species are abundant and widespread. These include *Madia minima*, *Epilobium minutum*, *Vulpia reflexa*, *Plagiobothrys tenella*, *Arenaria douglasii*, and *Collinsia parviflora*. Perennial species such as *Carex rossii*, *Penstemon deustus* ssp. *heterander*, *Horkelia tridentata*, and *Eriogonum* ssp. are widespread but scattered.

**Knobcone Pine Forest (83210):** 136 acres (55 ha). The most widespread of California closed-cone pines, this association is the most restricted of the forest types in the rRNA. The best-developed stands occur in hummocky areas where numerous sinuous lava ridges interdigitate with small interflow depressions or sinkholes formed by collapsed lava tubes. Although the pines may occur atop the ridges, they reach their greatest dimensions (up to 85 ft tall, 26 m) in depressions with a deep accumulation of soil and higher moisture availability. The rRNA's knobcone forest is characterized by a dense, even-aged canopy (dating back to the last extensive fire, about 1860) of spindly pines averaging 40-60 ft (12-18 m) in height and 9-13 inches (23-33 cm) dbh. Beneath the canopy is a relatively continuous subcanopy dominated by Baker cypress and suppressed knobcone pines. Understory species are similar to those in Baker cypress stands, but *Arctostaphylos patula* cover is lower than in most pure Baker cypress stands, perhaps as a result of the higher shading of the understory. The greater frequency of such relatively shade-tolerant mesophytic species as *Poa fendleriana*, *Claytonia spathulata*, *Cryopteris fragilis*, and *Collinsia parvifolia* compared to the cypress forest underscores the difference in understory conditions.

**Northern Basalt Flow Vernal Pool (44131):** 27 acres (11 ha). The two vernal pools at the rRNA are collectively known as the adobe vernal pools. They are similar in size and general characteristics and partially interconnected by a chain of small, narrow, moist (in May) meadows running along the border of the recent and Pleistocene flow.

The two pools are both underlain by clay pan soil derived from basaltic lava. Some vegetation differences may be the result of subtle soil differences between the two. Both pools have extensive flats associated with them. These are waterlogged for a much shorter period than the adjacent lower portion of the pools. At the S. pool the flats are alkaline with some evidence of salt deposit on the soil surface. Associated species are *Hesperochiron pumilis* and *Balsamorhiza hookeri*, known to be tolerant of alkaline soils. These species are absent from the N. pool flats. Other species common or abundant only at this S. pool flat area include *Allium lemmonii*, *Orthocarpus campestris*, *Lomatium piperi*, *Triteleia* sp., and *Perideridia* sp.

The main body of both pools, still moist to wet in May, contains the following dominants: *Eryngium mathiasiae*, *Plagiobothrys bracteatus*, *Cuscuta howelliana*, *Navarretia minima*, and *Psilocarphus brevissimus*. Later in the season such species as *Eremocarpus setigerus*, *Grindelia camporum*, and *Deschampsia danthonoides* are dominant. Three species of *Downingia*, all more strongly tied to lingering moisture than the above-mentioned species, are found lining the edges of the drying pools. *Downingia bicornuta* is the prevalent species at the N. pool, while *D. cuspidata* is prevalent at the S. pool. *Downingia bacigalupii* is a later flowering species.

Vernal pool species such as *Orcuttia tenuis* may have widely fluctuating population levels depending on yearly climatic and environmental conditions. Other species with infrequent distributions at the pools include: *Pogogyne zizyphoroides*, *Machaerocarpus californicus*, *Myosurus minimus*, *Mimulus tricolor*, *Gratiola ebracteata*, *Claytonia dichotoma*, *Lythrum hyssopifolia*, *Polygonum douglasii* var. *johnstonii*, *Eryngium alismaifolium*, *Boisduvalia glabella*, and *Polygonum* sp.

The deepest parts of both pools are dominated by *Heleocharis palustris*, *Polygonum amphibium* var. *stipulaceum*, and the emergent leaves of *Eryngium mathiasiae* at a time when water is 12-15 inches (31-38 cm) deep. The pools are dry by early July, even in the wettest years. The presence of an intermittent fringe of Oregon ash (*Fraxinus latifolia*) along the sides of the S. pool may indicate a somewhat greater water availability there than at the N. pool, which has no riparian woody plants.

**Rocky Bottomed Pools (no Holland equivalent):** 10 acres (4 ha). Aquatic vegetation is developed only in the largest of the several small, rock-bound pools at the rRNA. Characterized by the presence of a relatively unbroken rocky bottom, they lack a clay pan and tend to retain water longer than the vernal pools. Despite the physical differences, species composition of the large rocky pool is similar to that of the deeper parts of vernal pools. The shallow portions are dominated by *Heleocharis palustris*, *Heleocharis* sp., *Eryngium* spp., *Polygonum amphibium*, and *Callitriche* sp. Deeper portions are up to 2 ft (61 cm) deep and have a much sparser cover of the same plants. The persistence of water in several of these pools suggests that their bottoms are close to the water table that presumably underlies the recent lava flows.

### **Plant Diversity**

One hundred sixty-one taxa are listed.

### **Conflicting impacts**

The impact from cattle and associated range-management activities in the pool areas is light, with no conflict with the sensitive plant habitat. Recreational use is limited to a jeep road that appears to be used occasionally by hunters in the fall. The lava flow features in the rRNA are not spectacular enough to attract public attention, except for some specimen rock collection at the Brushy Butte quarry.

Roads lead to within a few yards of both vernal pools but vehicular activity is extremely low. Some felling of widely scattered ponderosa pine was noticed on older dense stands adjacent to the two vernal pools. In all cases, the cutting was light and took place before 1965.

No evidence of fire suppression activity is apparent on the rRNA, but fire management is important to many of the target vegetation types.