

13. Broom Flat (Broom Flat Ridge) (Burke 1992a)

Location

This candidate RNA is on the San Bernardino National Forest, 10 miles (16 km) S. of Big Bear City, San Bernardino County. It includes portions of sects. 25, 26, 35, and 36 of T2N, R2E (34°15'N., 116°45'W.), USGS Onyx Peak quad (fig. 26). Ecological subsection – Upper San Gorgonio Mountains (M262Bh).

Target Elements

Single-Leaf Pinyon (*Pinus monophylla*) and Pinyon-Juniper Woodland

Distinctive Features

Pinyon-juniper woodland distributes in the Great Basin (the basin lies between the Rockies and the Sierra Nevada) and Colorado Plateau regions. California's pinyon-juniper woodland is the westernmost extent of this widespread vegetation type. In the arid transmontane regions of California, pinyon-juniper woodlands occur on foothills, low mountains, plateaus, and mesas. In the Great Basin, the distribution of juniper and pinyon largely overlaps. However, in most of California, juniper and pinyon occupy relatively distinct ecological niches throughout their ranges. At Broom Flat Ridge, distributions of pinyon and juniper overlap to form a habitat

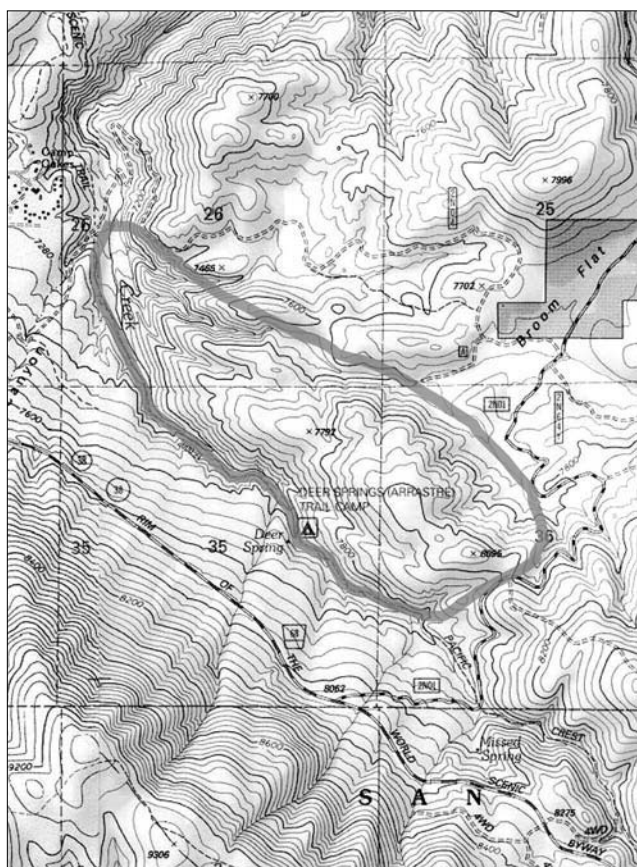


Figure 26—Broom Flat cRNA

strongly reminiscent of the typical Great Basin pinyon-juniper woodlands. Pinyon pine, western juniper (*Juniperus occidentalis* var. *occidentalis*), and mountain mahogany (*Cercocarpus ledifolius*) are all present in a wide range of age classes and widely distributed on the site. Notably large specimens of these species add great interest, as does the Great Basin aspect of the understory. This pinyon-juniper-mountain mahogany type is relatively uncommon in the San Bernardino Mountains. At Broom Flat Ridge and to the S., at Onyx Summit, are massive individuals of mountain juniper (*Juniperus occidentalis* var. *australis*) with trunk diameters of 6 ft (nearly 2 m) (fig. 27). These may be the oldest trees in S. California. With vegetation more typical of Modoc County in the far NE. of California, Broom Flat is unique to S. California.

Rare Flora: An unusual, disjunct stand of quaking aspen (*Populus tremuloides*), one of only two known occurrences in the San Bernardino Mountains, is found in a dry tributary of Arrastre Creek. *Astragalus leucolobus* (CNPS List 1B) and *Castilleja martinii* ssp. *ewanii* (Jepson Manual [Hickman 1993]: *Castilleja applegatei* ssp. *martinii*, also called *C. montigena* Heckard, Heckard's Indian paintbrush [CNPS List 4]) are also present within the cRNA boundaries.

Physical Characteristics

Broom Flat Ridge is a high-elevation, semi-arid site that shows characteristic desert influence. It lies E. of the main crest of the San Bernardino Range, in the rain shadow of San Gorgonio and Sugarloaf mountains. Elevations within the cRNA range from 7100 to 8095 ft (2165 to 2468 m). Slopes vary from 0° along the ridgetop to 43° along the steep terrain of W.- and E.-facing slopes. Several intermittent streams drain the ridge. Arrastre Creek runs along the W. boundary

of the cRNA. Deer Spring, a year-round spring except in severe drought conditions, occurs just outside the W. boundary of the site and feeds into Arrastre Creek at the Deer Springs Trail Camp on the Pacific Crest Trail.

Most of Broom Flat Ridge is composed of undifferentiated gneissic rocks of Precambrian age. A small area of Saragossa quartzite, a metasedimentary rock of Paleozoic age, is found along the ridgetop. Stream channels are filled with unconsolidated alluvium of very late Pleistocene and recent age, and a small area of intrusive plutonic rocks of Mesozoic age occurs near the S. boundary of the cRNA site. Soils are mapped as a single soil type, the Olete-Goulding families association. They are described as shallow to deep, well drained, and formed from material weathered from metamorphic rocks. Small areas of a deep, well-drained alluvial soil, the Morical and Hecker families complex, may occur inside the proposed E. boundary near Arrastre Creek along the Pacific Crest Trail.

The climate in the San Bernardino Mountains is characterized by infrequent winter rains and prolonged summer drought. Within the mountains, the varied terrain and elevation produce a wide range of local climatic conditions. Broom Flat Ridge is E. of the main crest of the mountain range and thus receives less precipitation than falls at the nearest year-round weather station, Big Bear Lake. No rainfall data are available for the site. Winter and summer temperatures should be comparable to those at Big Bear Lake, where average temperatures range from 30 to 65 °F (-1 to 18 °C), with extremes of 7 °F (-22 °C) and 87 °F (31 °C) possible. Frost-free days number about 100 per year.

Association Types

Great Basin Pinyon Juniper Woodland (72121): 295 acres (118 ha). Due to the variety of slopes and exposures along the N.-S.-trending ridge, the percentage of tree cover, relative proportion of the dominant tree species, and understory vegetation vary significantly within a small area, and many variants of the vegetation type are found close together. On steep, dry slopes, mountain mahogany shares dominance with pinyon pine while scattered individuals of mountain juniper and Jeffrey pine (*Pinus jeffreyi*) together account for up to 10 percent of the tree cover. Bare ground or rock may cover 50 percent of such sites. On drier, upper slopes, Jeffrey pine drops out and pinyon-juniper tree cover increases. In this open woodland, species typical of the Great Basin occur as shrubby associates. *Artemisia tridentata*, *Chrysothamnus nauseosus*, *C. parryi*, *C. viscidiflorus*, and *Purshia glandulosa*, together with the grass *Sitanion hystrix*, can account for 5-30 percent cover. Other associated herbs and grasses occur in scattered locations but provide very little cover.

On the relatively flat, broad ridgetop at the S. end of Broom Flat Ridge, the pinyon-juniper woodland can be dense, with 40-60 percent tree cover. Tall specimens of mountain mahogany occur as dense stands or scattered individuals, and occasional Jeffrey pine and canyon live oak (*Quercus chrysolepis*) are also present. Needle duff about 0.5 to 3 inches (1 to 8 cm) deep occurs together with decomposing pine cones, and the shrub and herb layers are relatively sparse. Scattered in the understory are *Arctostaphylos patula*, *Chrysothamnus viscidiflorus*, *Artemisia tridentata*, *Astragalus leucolobus*, *Caulanthus major*, *Chenopodium fremontii*, *Cordylanthus filifolius*, *Cryptantha pterocarya* var. *purpusii*, *Erigeron aphanactis*, *Eriodictyon angustifolium*, *Eriogonum* spp., and *Eriophyllum confertiflorum*. The cactus *Opuntia basilaris* var. *basilaris* occurs among the rocks throughout this woodland, and *Echinocereus engelmannii* is present on the main ridgetop. Gaps in the woodland are characterized by clumps of *Stipa coronata*, *Eriogonum kennedyi*, *Eriophyllum confertiflorum*, *Sitanion hystrix*, and *Opuntia basilaris*. Sites in the woodland with a grassy understory support relatively dense stands of *Poa fendleriana* or *Stipa coronata*. *Oryzopsis hymenoides* and *Stipa comata* are also associated with this pinyon-juniper woodland.

Figure 27—Broom Flat, massive individuals of mountain juniper (*Juniperus occidentalis* var. *australis*), some with trunk diameters over 6 feet (1.8 m), on Broom Flat Ridge near Onyx Summit. These may be the oldest trees in southern California. (around 1991)



Great Basin Mixed Scrub (35100): 58 acres (23 ha). Species typical of Great Basin mixed scrub occur at Broom Flat Ridge as an important understory of the pinyon-juniper woodland, as noted above. On S.-facing slopes or other xeric sites, where tree cover decreases and may drop out completely, these species form patches of Great Basin mixed scrub. Extensive areas of bare ground or rock cover up to 50 percent at these sites. The moderately tall and fairly open shrub land is dominated by *Artemisia tridentata* and various *Chrysothamnus* species, most notably *C. nauseosus*. Shrub cover varies from 35 to 50 percent, with the grass *Sitanion hystrix* contributing 5-15 percent cover in places. *Stipa coronata*, *Bromus tectorum*, *Oryzopsis hymenoides*, *Leptodactylon pungens*, and *Galium angustifolium* are other typical associates in the sparse herbaceous layer. This vegetation occurs in relatively small patches, although an extensive patch with

a few pinyon or Jeffrey pines in the overstory occurs on a S.-facing slope visible from a pullout of Highway 38.

Montane Manzanita Chaparral (37520): 12 acres (5 ha). Along the top of Broom Flat Ridge, near the center of the site, occurs an extensive patch of 6- to 15-ft (2- to 5-m) tall chaparral, dominated by *Arctostaphylos patula*, as a post-fire successional stage. This area is underlain by a different rock type, *Saragossa quartzite*, which may control the boundaries of the vegetation. Gaps in the chaparral support a sparse assemblage of plants, including *Artemisia tridentata*, *Sitanion hystrix*, *Cordylanthus filifolius*, *Hymenopappus filifolius* var. *lugens*, *Cryptantha pterocarya* var. *purpusii*, *Tetradymia canescens*, *Bouteloua gracilis*, and *Eriogonum parishii*.

Jeffrey Pine Forest (85100): 102 acres (41 ha). A narrow strip of a mesic, tall, open forest dominated by Jeffrey pine forms the W. boundary of the cRNA. It supports diverse understory shrubs and herbs typically found in riparian sites in the S. California mountains. The tree layer, predominantly Jeffrey pine, accounts for 30-40 percent cover, with occasional white fir (*Abies concolor*) and juniper in scattered locations. The shrub layer is diverse and changes in response to local environmental conditions such as slope, aspect, and soil moisture. Immediately along the creek is a distinct vegetation type, the southern willow scrub (63320). Thickets of *Salix lasiolepis*, with *Potentilla glandulosa* and *Carex senta* in the

dense, shady understory, occur in a mosaic with the Jeffrey pine forest and sometimes with an overstory of Jeffrey pine. Away from the creek, but still on moist soils at relatively flat sites, the willows are joined by *Ceanothus cordulatus* and *Rosa californica*. *Artemisia tridentata* is found in scattered locations throughout, especially at the dry upper edge of the forest. Under an open tree layer, in some particularly mesic sites, are bright green swales consisting of a diverse mixture of herbs dominated by *Smilacina stellata* and *Solidago californica*. Frequent associates include *Artemisia ludoviciana*, *Geranium richardsonii*, *Mimulus pilosus*, *M. rubellus*, *Potentilla glandulosa*, *Stachys albens*, and *Taraxacum officinalis*. In more heavily

wooded and drier sites, *Poa fendleriana*, *Sitanion hystrix*, and *Stipa comata* are typical grass associates. Shrubby elements include *Arctostaphylos patula* ssp. *platyphylla*, *Purshia glandulosa*, *Ribes cereum*, *Rosa woodsii*, and *Symphoricarpus parishii*.

Jeffrey pine forest also occurs along the E. margin of Broom Flat cRNA, often climbing the E. canyons. A variant of the Jeffrey pine forest is found in cold air drainage basins along the top of Broom Flat Ridge. In these gently sloping ridgetop depressions, Jeffrey pine shares dominance with pinyon pine and mountain mahogany, accompanied by an understory of perennial grasses.

Aspen Forest (81800): 0.74 acres (0.30 ha). Near the N. tip of the cRNA is an unusual disjunct grove of quaking aspen. Although abundant E. of the Sierra Nevada crest and again in the mountains of Baja California, aspen is largely absent from the mountains of S. California. In the San Bernardino Mountains, it is found only here, along a tributary of Arrastre Creek, and on Fish Creek, just NE. of the San Geronimo Wilderness. These two groves, separated from the nearest populations by more than 200 miles (322 km), are believed to be relicts from the late Pleistocene when the climate was much cooler and wetter. This zonal aspen forest can occur away from stream banks, and the transition between the aspen grove and other plant communities can be abrupt. The Arrastre Creek aspen grove occurs in a steep canyon, about 200 yards up a rocky, dry tributary amid a woodland typical of the upper limits of the Jeffrey pine forest. *Poa fendleriana* is the most widespread understory associate; others include *Artemisia dracunculus*, *A. ludoviciana*, *A. tridentata*, *Carex* sp., *Eriophyllum lanatum*, *Erysimum capitatum*, *Galium* sp., *Leptodactylon pungens*, *Opuntia basilaris*, *Penstemon eatonii*, *Purshia glandulosa*, *Salvia pachyphylla*, *Stipa* sp., *Brickellia californica*, *Chrysothamnus nauseosus*, and *Echinocereus triglochidiatus*.

Species Diversity

Eighty-four plant species are listed.

Conflicting Impacts

Before 1900, mining occurred E. of Broom Flat and a sawmill was operated at Broom Flat itself. Although easily accessible by two Forest Service roads and bordered on the W. edge by the Pacific Crest Trail, the site is surprisingly free of disturbance. Hikers tend to stay near the trail, and Deer Springs Trail Camp has only a local impact. The most significant current disturbance is near the top of the ridge, near Road 2N01, where there is evidence of off-road parking, illegal firewood gathering, and some camping. A few fire rings can be found nearby. The impact of the campsites appears confined to this region and to several sites on the ridge near the E. boundary. Cattle may occasionally wander from a Bureau of Land Management allotment N. of the forest, but significant damage has not been documented. Feral burros are reported in this general area. Like the cattle, the burros' main impact on the site is some trampling and grazing.