

45. Indiana Summit (Taylor 1980)

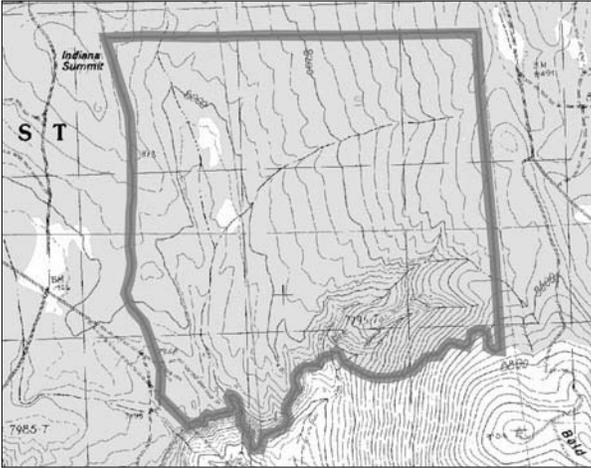


Figure 93—Indiana Summit RNA

Location

This established RNA is on the Inyo National Forest in Mono County, about 8.5 miles (13.7 km) E. of June Lake. It includes portions of sects. 5, 6, 7, and 8 of T2S, R28E MDBM (37°49'N., 118 °55'W.), USGS Crestview quad (*fig. 93*). Ecological subsection – Glass Mountain (341D1).

Target Element

Jeffrey Pine (*Pinus jeffreyi*)

Distinctive Features

Extensive Virgin Jeffrey Pine Forest: The Jeffrey pine forest at Indiana Summit is part of a large tract of essentially pure Jeffrey pine forest stretching from the E. flank of the Sierra Nevada across the

divide between the Mono Basin and Owens River drainage. Much of this forest has been harvested for timber, and the RNA preserves a rare pristine example.

First California RNA: The Indiana Summit RNA was the first RNA established in California (1932). It is cited as an example of a coniferous forest ecosystem in widely-used textbooks on ecology (Whittaker 1975) and also by the American Museum of Natural History, which has a diorama based on Indiana Summit.

Fire History: Fire is important in shaping the Jeffrey pine forest. A fire recurrence interval of about 15 years is verifiable in cut stumps adjacent to the RNA. No fires have occurred recently. Canopy structure indicates only ground fires in the past. Natural fires were apparently light and patchy. Reproduction of Jeffrey pine is also patchy, and the scales of fuel density and reproduction patches overlap, suggesting successful Jeffrey pine reproduction may depend on fire. Jeffrey pine reproduction, especially in the white fir (*Abies concolor*) forest, appears to be tied strongly to fire, with this species excluded from these sites if succession proceeds without disturbance. Crown fire potential has likely increased on adjacent lands due to increased stocking rates and lower canopies. Because of the xeric nature of the forest, brush densities following fires are low and do not alter stand regeneration times.

Rare and Endemic Plants: *Lupinus duranii*, a member of CNPS List 4, is a conspicuous member of the open Jeffrey pine forest and pumice-flat area. *Artemisia cana* ssp. *bolanderi* is endemic to the Mono Basin, but not considered rare by CNPS.

Archeological Value: The Paiute Indians harvested larvae of piagi (Pandora moth [*Coloradia pandora*]), which cyclically attack Jeffrey pine, by digging trenches encircling the trunks of mature trees. These piagi trenches may still be seen surrounding some of the larger Jeffrey pines, although their evidence has been largely obliterated by logging and other disturbance in adjacent areas.

Rare Fauna: A prairie falcon (*Falco mexicanus*), State-listed as species of special concern, was seen nesting in the area in 1977 during the fieldwork for this report.

Physical Characteristics

The area encompasses 1162 acres (470 ha) and ranges from 7800 to 8500 ft (2377-2590 m). It is located on the southernmost margin of an extensive recent volcanic plateau characterized by small pumice basins interspersed between rolling

uplands formed by tuffaceous ash falls and volcanic flows. At the S. end, tuffaceous cliffs resulting from erosion create bold relief. The entire area is covered by ash-fall deposits, making for very well-drained soils.

Rocks are loosely welded volcanic tuff (Bishop formation) about 700,000 years old. The ash deposits are 700-10,000 years old, originating from the nearby Mono and Inyo Craters. Soils are Orthic Humic Entisols. Most precipitation falls as snow from November to March. Snow reaches 3.2 ft (1 m) deep and may last 3 months. Winter daily temperatures are estimated at 23-41 °F (-5 to +5 °C), while summer daily ranges are 50-81 °F (10-27 °C). Rainfall is estimated at 12-16 inches (305-406 mm) annually.

Association Types

Seven association types were defined using releves and following the construction of an association table. An additional fifteen 15-m-radius plots were sampled to estimate basal area cover and stem density for forest types. Acreage is not given for all types.

Jeffrey Pine/*Purshia tridentata* (85100): 872 acres (353 ha). Jeffrey pine is often the only conifer species in this association, but scattered lodgepole pine (*Pinus contorta* ssp. *murrayana*) occur. This is an open forest with typically less than 50 percent canopy cover. *Purshia tridentata* is the low shrubby dominant, covering up to 70 percent of the ground. Density of Jeffrey pine ranges from 113 to 877 stems/ha on eight plots. Basal area of Jeffrey pine ranges from 28.4 to 77.9 m²/ha. The site-index estimate for Jeffrey pine is less than 32 ft (10 m)/100 years. This low index indicates low productivity and probably low recruitment and regeneration rates.

Herb cover is sparse with only a few species tallied. These include *Carex rossii*, *Gayophytum diffusum* ssp. *parviflorum*, *Stipa californica*, *Stephanomeria tenuifolia*, *Lupinus duranii*, *Leptodactylon pungens* ssp. *pulchriflorum*, and *Linanthus nuttallii*.

Lodgepole Pine/*Calyptridium umbellatum* (86100): 174 acres (71 ha). In this association lodgepole pine is dominant, with occasional large Jeffrey pine. The shrub layer is the most poorly developed of all the forest types. *Artemisia tridentata* and *Purshia* are predominant with a low herb cover including *Calyptridium umbellatum*, *Chrysothamnus parryi*, and *Stipa elmeri*.

Lodgepole pine basal area ranges from 9.0 to 37.3 m²/ha on the four plots, and tree density ranges from 71 to 212/ha.

White Fir/*Prunus emarginata* (84240, 85210): 116 acres (47 ha). This type occurs on N.-facing slopes. It is codominated by white fir and Jeffrey pine; the former species is the climax dominant (fig. 94). The N. exposures are moister and therefore have more shrub cover and diversity compared to the Jeffrey pine-*Purshia tridentata* forest. The relatively deep snow pack not only provides more water with relatively low evapotranspiration rates (due to N.-facing slopes), but also reduces the threat of desiccation to winter drought-susceptible species.

The basal area of white fir ranges from 27.6 to 38.5 m²/ha in three plots. Total basal area ranges from 49.1 to 80.6 m²/ha. The mean dbh of white fir is 17.3 inches (44 cm) and for Jeffrey pine, 15 inches (38 cm). Total stem density ranges



Figure 94—Indiana Summit, upper boundary of Indiana Summit RNA. Ecotone seen is between *Abies concolor*-*Prunus emarginata* and adjacent *Artemisia-Symphoricarpos* on Bald Mt. *Pinus monticola* occurs in this ecotone. (1977)

from 424 to 452/ha. Sapling density (49/ha) is lower than in Jeffrey pine-dominated forest. After fire this type becomes dominated by *Artemisia tridentata*/*Symphoricarpos vaccinioides* vegetation.

Herb cover is sparse with only occasional individuals of *Bromus carinatus*, *Arabis holboellii* var. *retrofracta*, *Carex rossii*, *Poa fendleriana*, and *Leptodactylon pungens* ssp. *pulchriflorum*. Shrubs include *Prunus emarginata*, *Artemisia tridentata*, *Ribes cereum*, *Symphoricarpos vaccinioides*, *Ceanothus velutinus*, and *Chrysolepis sempervirens*.

***Artemisia tridentata*/*Symphoricarpos vaccinioides* (35210):** This association occupies shallow soils on steep, windswept slopes with light snow cover. It is subclimax on some sites, successional to the white fir-*Prunus emarginata* forest. Additional species include *Ribes cereum*, *Ceanothus velutinus*, *Bromus carinatus*, *Purshia tridentata*, *Stipa californica*, and *Leptodactylon pungens* ssp. *pulchrifolium*.

***Haplopappus bloomeri*/*Gayophytum diffusum* (no Holland equivalent):** This is a successional type following fire in the *Pinus*-*Purshia* type. Other species include *Ceanothus velutinus*, *Purshia tridentata*, *Stephanomeria tenuifolia*, *Eriogonum vimineum*, *Arabis platysperma*, *Eriogonum spergulinum* ssp. *reddingianum*, *Eriogonum nudum* ssp. *deductum*, and *Stipa elmeri*.

***Chrysothamnus parryi*/*Stipa elmeri* (35400):** This type occurs on excessively drained pumice flats. Other species contributing to the sparse cover include *Artemisia tridentata*, *Calyptridium umbellatum*, *Lupinus duranii*, *Mimulus coccineus*, *Agoseris glauca* ssp. *monticola*, *Hulsea vestita*, *Oenothera xylocarpa*, and *Sitanion hystrix*.

***Artemisia cana* ssp. *bolanderi*/*Carex douglasii* (no Holland equivalent):** This type occurs in moist areas in centers of large pumice basins and around moist flats. The dominant shrub is endemic to Mono County. Additional species include *Calyptridium umbellatum*, *Mimulus coccineus*, *Muhlenbergia richardsonis*, *Draba stenoloba* ssp. *nana*, *Juncus mertensianus*, *Haplopappus apargioides*, *Lupinus confertus*, *Thelypodium crispum*, and *Heleocharis palustris*.

Plant Diversity

Seventy-three taxa are listed.

Conflicting Impacts

Tracks resulting from off-road vehicles have been observed within the RNA although disturbance is minimal. Recent woodcutting, including cutting of standing snags useful as wildlife habitat, has occurred within the RNA. These problems could be lessened if signs around the periphery of the area were maintained and increased in frequency. There has been logging on three sides of the RNA up to the boundaries.