

25. Devil's Rock-Hosselkus (Devil's Rock, Hosselkus Limestone) (Keeler-Wolf and Keeler-Wolf 1975, Keeler-Wolf 1989h, Cheng 1997b)

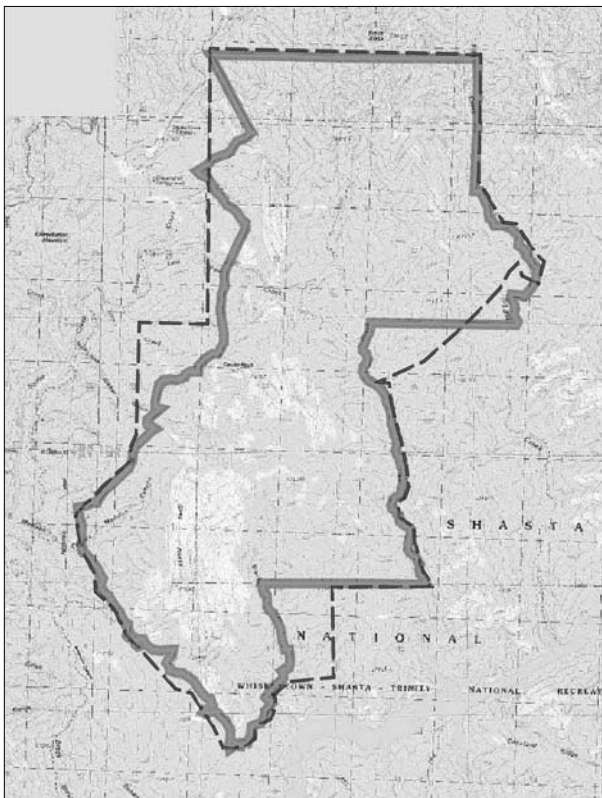


Figure 51—Devil's Rock-Hosselkus RNA

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

Location

This established RNA is on the Shasta-Trinity National Forest. It is centered approximately 24 miles (39 km) NE. of Redding. The area includes all or portions of sects. 21, 22, 23, 26, 27, 28, 32, 33, 34 T35N, R2W and sects. 3, 4, 5, 8, 9, and 16 T34N, R2W MDBM (40°51'N., 122°06'W.), USGS Devil's Rock, Goose Gap, and Minnesota Mtn. quads (fig. 51). Ecological subsection – Eastern Klamath Mountains (M261Ai).

Target Elements

Limestone Ecosystem (unique element), California Black Oak (*Quercus kelloggii*), and Canyon Live Oak (*Quercus chrysolepis*)

Distinctive Features

Limestone Values: A variety of important values can be attributed to the presence of extensive beds of Triassic limestone in the area (fig. 52). These include the localized endemic plant *Eupatorium shastensis*, wider ranging plants endemic to limestone substrates (e.g., *Cheilanthes cooperae*, *Adiantum capillaris-veneris*), localized endemic land snails (Shasta sideband snail [*Monodenia troglodytes*], a category 2 candidate for listing by

the U.S. Fish and Wildlife Service, which means existing information indicates taxa may warrant listing, but substantial biological information necessary to support a proposed rule is lacking), a localized endemic salamander (Shasta salamander [*Hydromantes shastae*], a State-listed threatened species), a rich assemblage of Triassic invertebrate fossils (including ammonites, brachiopods, corals, in all more than 200 species of invertebrates), the best representation of N. American Triassic marine reptiles (including five species and three genera of ichthyosaurs and the only known remains of the order Thalatosauria in the W. Hemisphere), and more recent Pleistocene vertebrate fossils in cave deposits (including at least one representative of every vertebrate class). These combined values cannot be duplicated in any other area.

California Black Oak: This is the only designee for this fire-adapted target element in the Klamath Mountains ecological section. The extensive forests dominated by California black oak in the E. portion of the area (the former Devil's Rock candidate RNA) cover a larger area on more varied slope exposures and a greater diversity of stocking densities and subtypes than can be found on the other RNAs currently designated for this target element in California (fig. 53). The variety of successional states, including Douglas-fir (*Pseudotsuga menziesii*) invasion on mesic exposures and ponderosa pine (*Pinus ponderosa*) and foothill pine (*P. sabiniana*) on more xeric exposures, is of particular interest. On steeper slopes, California black oak merges with and gives way to canyon live oak forest.

Biogeographic Significance: This area, at the junction of the Klamath Mountains and Great Valley ecological sections, is the meeting place for a number of plants

and animals at or near their distributional limits. Nineteen species of vascular plants are thought to be at or near their N. range limits (including *Salvia sonomensis*, *Collinsia tinctoria*, *Aesculus californica*, *Dendromecon rigida*, *Fraxinus dipetala*, *Styrax officinalis* var. *californica*, and *Calycanthus occidentalis*), while 10 species are at or near their most inland occurrences (including *Whipplea modesta*, *Viola ocellata*, *Acer circinatum*, *Aruncus vulgaris*, and *Cacaliopsis nardosmia*). Several animals such as California newt (*Taricha torosa*), striped racer (*Masticophis lateralis*), and Nuttall's woodpecker (*Picoides nuttallii*) are near their N. limits. Species such as black salamander (*Aniades flavipunctatus*), tailed frog (*Ascaphus truei*), and Pacific giant salamander (*Dicamptodon ensatus*) are near their most inland locations in California.

Archeological Values: This RNA is adjacent to a significant multilevel cultural deposit dating back at least 6500 years. Although no excavations or thorough searches for artifacts have been conducted in the RNA, sites occupied by American Indians have been discovered in caves in the S. of the area.

Rare Plants: The endemic *Eupatorium shastensis* is considered a member of List 4 by CNPS. Shasta snow-wreath (*Neviusia cliftonii*), CNPS List 1B, is a species discovered in 1992. This species is thought to be relict from the Arcto-tertiary period; its closest relative occurs in SE. United States.

Rare Animals: The Shasta salamander (*Hyromantes shastae*) is listed by California State as threatened, and it is considered sensitive species by the Shasta-Trinity National Forests. The land snail (*Monodenia troglodytes*) is a candidate for State listing.

Physical Characteristics

The survey area covers 6439 acres (2608 ha) with elevations from 1100 to 3272 ft (335 to 997 m). The established RNA is 5550 acres (2246 ha). This area occupies the upper Brock Mountain peninsula between the Squaw Creek and Pit River arms of Lake Shasta. It is bisected by a prominent N.-S. trending ridge of rugged, resistant gray limestone, which stretches for about 5 miles (8 km). This limestone rises above 3000 ft (914 m) in several locations but is deeply cut by the canyon of Low Pass Creek in the N. portion of the area. The area E. of the limestone is gentler topography, dominated by the valleys of S.-flowing Flat and Ripgut creeks. Slopes of all aspects are well represented.

Rocks include the previously discussed Hosselkus Limestone, Brock Shale (which underlies the majority of the E. portion), and the Pit formation (shaley-siltstone, metadacite, and limestone, underlying a small portion of the NW. side of the area). Soils within the area are relatively complex and have been divided into 12 mapping units. The families represented include Neuns, Marpa, Kidig, Goulding, Boomer, and Speaker, with extensive areas of limestone rock outcrop. Precipitation is estimated at 60-70 inches (1524-1778 mm) annually. Highest and lowest annual temperatures are estimated to be 109 °F (42.8 °C) and 24 °F (-4.4 °C).

Association Types

The associations are described qualitatively; no vegetation sampling was conducted.

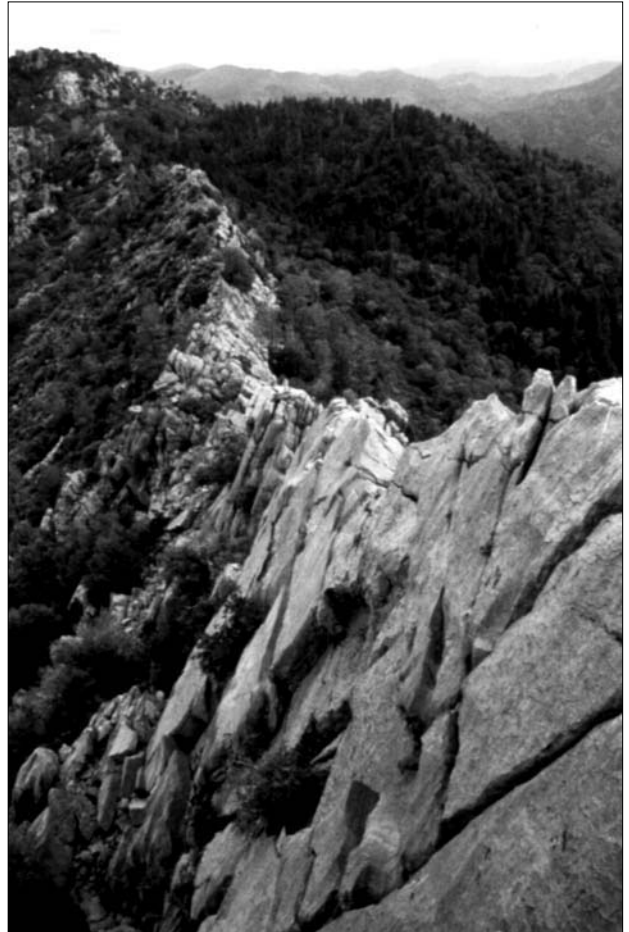


Figure 52—Devil's Rock-Hosselkus Limestone, sharp-edged outcrop of Hosselkus limestone at Gray Rocks, looking north. (1988)

California Black Oak Forest (81340, 81320, 71110, 71120): 3246 acres (1315 ha). Oak-dominated vegetation in the RNA is a result of past widespread fires. Typically, the upper S., W., and E. exposures with relatively deep soil and slope angles of <45 percent are clothed in black oak. The majority of these forests are younger than 100 years (mean age is 74 years). Growth rates and understory composition depend primarily on slope exposure. Several types are present. The following are brief descriptions of the variants:

W.-facing slope with black oak dominant over an understory of *Elymus glaucus* with *Toxicodendron diversilobum*, *Corylus cornuta* var. *californica*, *Symphoricarpos mollis*, *Galium aparine*, *Trillium chloropetalum*, *Osmorhiza chilensis*, and *Aristolochia californica*, among others. There may be saplings of ponderosa pine and Douglas-fir. Some of the larger black oaks occur here (0.6 m dbh and 21 m tall).

SE.-facing slopes on W. side of RNA with high percentage of ponderosa pine and sparse understory including *Iris tenuissima*, *Brodiaea lutea* var. *analina*, *Hypericum concinnum*, *Collomia heterophylla*, *Viola lobata*, *Silene campanulata*, and *Brodiaea multiflora*. This type is transitional to the ponderosa pine phase of the low-elevation mixed conifer forest discussed in a following section.

SW.-facing slopes at high elevations on E. side of RNA. This is a spindly woodland with black oak 15-51 cm dbh and an understory of *Styrax officinalis* var. *californica*, *Melica californica*, *Carex multicaulis*, *Toxicodendron diversilobum*, and reproduction by Douglas-fir and foothill pine.

SE.-facing slopes on E. side of RNA with black oak 31-46 cm dbh and 15-17 m tall with a shrubby understory of *Styrax officinalis* var. *californica*, *Philadelphus lewisii* ssp. *californicus*, *Toxicodendron diversilobum*, *Cercis occidentalis*, and *Ceanothus integerrimus*. There are scattered grassy patches dominated by *Melica californica* and *Elymus glaucus*.

Highest elevation ridgetop stands where black oak dominates over a well-developed grassy understory with *Festuca californica*, *Elymus glaucus*, *Microseris nutans*, *Senecio aronicoides*, *Silene lemmonii*, *Agoseris grandiflora*, *Daucus pusillus*, *Cynosurus echinatus*, *Hydrophyllum occidentale*, and *Claytonia perfoliata* (among others).

On gentle NW.-facing slopes with deep soil, black oak dominates along with bigleaf maple (*Acer macrophyllum*) and canyon live oak with a dense understory dominated by *Corylus cornuta* var. *californica*.

Steep E.-facing slopes with shallow soils have spindly black oak co-dominant with canyon live oak and a sparse understory.

At highest elevations with steep S. exposures or on rocky slopes of shale or limestone, black oak gives way to stands of Oregon white oak (*Quercus garryana*). These stands (similar to Holland 71110) are typically stunted and compact (5-13 cm dbh, 2.4-3.7 m tall).

On very steep slopes of virtually any exposure, canyon live oak tends to dominate in dense stands with little understory except scattered *Toxicodendron diversilobum* and *Corylus cornuta* var. *californica* (Holland 81320). These steep locales may be spared from fire for long periods, and thus some canyon live oak may attain dbh of more than 3 ft (1 m) and heights above 70 ft (21 m).

Limestone Scrub (37110, 37541, 71420): 1631 acres (661 ha). This vegetation resembles mixed chaparral in its principal constituents except for Brewer oak (typical of montane chaparral). It is more open than most chaparrals as a result of the abundant jagged limestone outcrops. *Cercocarpus betuloides* dominates most xeric rocky sites along with such herbs as *Arabis breweri*. Other dominants on less xeric sites include Brewer oak, *Philadelphus lewisii* ssp. *californicus*, California buckeye (*Aesculus californica*), *Rhamnus crocea* ssp. *ilicifolia*, *Garrya fremontii*, *Fraxinus dipetala*, *Cercis occidentalis*, *Holodiscus discolor*, *Clematis lasiantha*, and foothill pine. The most mesic N.-facing cliffs have a scattering of canyon live

oak and such characteristic species as *Eupatorium shastensis*. The primary factor determining the distribution of limestone scrub is the substrate, whether on limestone or shale, this vegetation type occurs generally on the poorest rocky slopes and outcrops.

Low-Elevation Mixed Conifer Forest (84110, 81100, 84131): 1562 acres (633 ha). This association occupies the ravine bottoms and sheltered exposures. It is divisible into two subtypes. One bears a resemblance to the coastal mesic Douglas-fir-mixed evergreen forests, and the other is more similar to xeric ponderosa pine-Douglas-fir type (Society of American Foresters [SAF] type 244, Eyre 1980).

The Douglas-fir canyon-bottom subtype is well-protected from crown fire, and the largest dominants are 150 ft (46 m) tall and 5-6 ft (1.5-1.8 m) dbh. Typical Douglas-fir dominants are 2-4 ft (0.6-1.2 m) dbh and are associated with large individuals of canyon live oak, bigleaf maple, Pacific madrone (*Arbutus menziesii*), and California black oak (up to 4 ft, 1.2 m dbh). Beneath the taller trees is an understory of woody species including Pacific dogwood (*Cornus nuttallii*), *Corylus cornuta* ssp. *californica*, *Holodiscus discolor*, *Physocarpus capitatus*, *Toxicodendron diversilobum*, *Rosa gymnocarpa*, and *Ribes sanguineum*. The herb layer, which is diverse and variable in cover, includes *Viola ocellata*, *Trientalis latifolia*, *Asarum hartwegii*, *Smilacina racemosa* var. *amplexicaulis*, *Campanula prenanthoides*, *Dryopteris arguta*, *Polystichum munitum*, *Adiantum jordanii*, and *Heuchera micrantha* var. *pacifica*.

The ponderosa pine-dominated subtype occurs on N.-facing slopes and on relatively sheltered W.- and E.-facing slopes. California black oak is also a common component of the tree strata, and occasional sugar pines (*Pinus lambertiana*) may occur at upper elevations. Shrub and herb cover is sparser than in the Douglas-fir type and includes the shrubs *Arctostaphylos viscida*, *Ceanothus prostratus*, *C. lemmonii*, and *Lupinus albifrons* over a scattered low herbaceous cover of *Balsamorhiza deltoidea*, *Hieracium albiflorum*, *Apocynum pumilum*, *Lotus stipularis* ssp. *balsamifera*, *Lupinus albicaulis*, *Carex multicaulis*, *Festuca californica*, and *Horkelia tridentata* (among others).

Canyon Riparian Forest (61510): Acreage small (<100 acres or 40 ha). This association lines the deeper canyon bottoms, surrounds springs, and follows trickles up shady N. slopes. The association is best developed along Low Pass, Flat, and Ripgut creeks. Dominant trees and shrubs include white alder (*Alnus rhombifolia*), Oregon ash (*Fraxinus latifolia*), bigleaf maple, *Cornus sessilis*, *Calycanthus occidentalis*, and *Prunus virginiana* var. *demissa*. In sunny locations *Vitis californica*, *Rubus ursinus*, and *Smilax californica* climb over trees and shrubs. In deep, shady canyons Pacific yew (*Taxus brevifolia*) and vine maple (*Acer circinatum*) may be locally common, and *Cornus sessilis* tends to dominate. The herb understory varies depending on shade and water availability. Typical species include *Woodwardia fimbriata*, *Aralia californica*, *Peltiphyllum peltatum*, *Mimulus guttatus*, and *Luzula divaricata*.

Plant Diversity

A total of two hundred fifty-seven taxa are listed in the establishment record, an updated version of the list in the ecological survey.

Conflicting Impacts

Despite the fact that the S. end of the area is within the Whiskeytown-Shasta-Trinity National Recreation Area, this RNA is relatively remote and receives little visitation except from hunters and spelunkers visiting the caves in the Low Pass region. Some cave vandalism has occurred in the past. A jeep road enters Low Pass Canyon, traversing the limestone in a sensitive area (containing caves, associated flora and fauna, and fossil deposits).