Aliso: A Journal of Systematic and Floristic Botany

Volume 9 | Issue 2 Article 12

1978

Floristics of Pavement Plains of the San Bernadino Mountains

Jeanie A. Derby

Ruth C. Wilson

ALISO
9(2), 1978, pp. 374–378

FLORISTICS OF PAVEMENT PLAINS OF THE SAN BERNARDINO MOUNTAINS

Jeanie A. Derby and Ruth C. Wilson

Introduction

Pavement plains observed in the San Bernardino Mountains support a unique vegetation including some rare endemics. Perhaps the most unusual and notable feature of these sites is that they do not support trees. They appear as islands of sparse, low-growing vegetation within forests of Jeffrey Pine (*Pinus jeffreyi* Grev. & Balf in A. Murr.) or woodlands of Pinyon Pine (*Pinus monophylla* Torr. & Frem.). Among the 31 plant species of the pavement plain flora are five San Bernardino Mountain endemics. Two of these endemics are further restricted, only occurring on the San Bernardino Mountain pavement plains.

The first reported observations of these unusual vegetation associations were made in July (Derby, 1975). Robert Thorne (1976) compared Table Mountain in the San Gabriel Mountains, approximately 80 km to the west, to the San Bernardino Mountain sites.

During the two years following the "discovery" of the pavement plains (Derby, 1975), 12 discrete locations have been documented within National Forest lands where the habitat exists in a relatively undisturbed condition (Derby 1976, 1977). Several other pavement-plain sites occur on private lands which are now partially covered by buildings and dissected by roads, the inevitable result of population growth in the Big Bear Basin. This report will document the species present on the edaphically and vegetatively unique pavement plains.

Location and Habitat

The pavement plains are located within approximately 155 km^2 of the northeastern San Bernardino Mountain Range, part of the Transverse Ranges Geomorphic Province of California. The plains center around Big Bear and Holcomb Valleys at elevations between 1830 and 2288 m (Fig. 1).

Big Bear Valley is a generally flat easterly trending valley, believed to have been formed largely by thrust faulting during the mid to late Pleistocene (Brown and Associates, 1974; Stout, 1976). Holcomb Valley has been described as part of an early quarternary surface, once contiguous with the area around Bluff Lake prior to the formation of Bear Valley (Brown and Associates, 1974).

The plains, themselves, are level or gently sloping sites ranging from two to eight hectares in size (Fig. 2). Soils are a reddish color, with a relatively

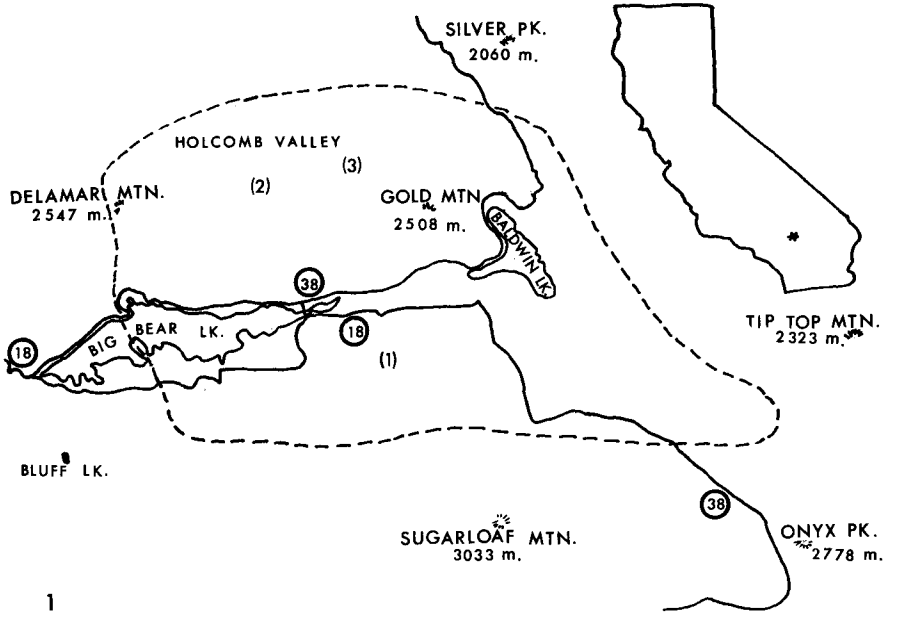

Fig. 1. General range for 12 recorded pavement-plain sites and specific sites of 1977 studies.—(1). Vincinity of Sawmill Canyon.—(2). Vicinity of Van Duesen Canyon.—(3). Arrastre Flat.

high percentage of clay, ranging up to 53% clay at a depth of 23–46 cm on one study site according to preliminary soil tests. More intensive soil studies are in progress. Soil color, texture, and surface rock fragments are distinctive for the pavements and differ markedly from the surrounding forested sites.

The treeless pavement plains (Fig. 2) show no evidence of ever having supported trees. They do not appear to fit into the category of treeless balds which has been interpreted as an ecotonal phenomenon, existing near the climatic tolerance limits of the principal forest dominants (Billings and Mark, 1957). All evidence would indicate that these unique sites comprise a topographic-edaphic climax within the surrounding Jeffrey Pine Forest or Pinyon Pine Woodland.

Floristics of the Pavement Plains

The flora of the San Bernardino Mountain pavement plains is reminiscent of an alpine flora; dominated by caespitose perennials, cushion plants and dwarfed annuals. Occasionally a dwarfed form of *Artemisia tridentata* Nutt. ssp. *tridentata* occurs on the pavement plains. Otherwise the two adjacent plant associations, forest and pavement plain, tend to be mutually exclusive

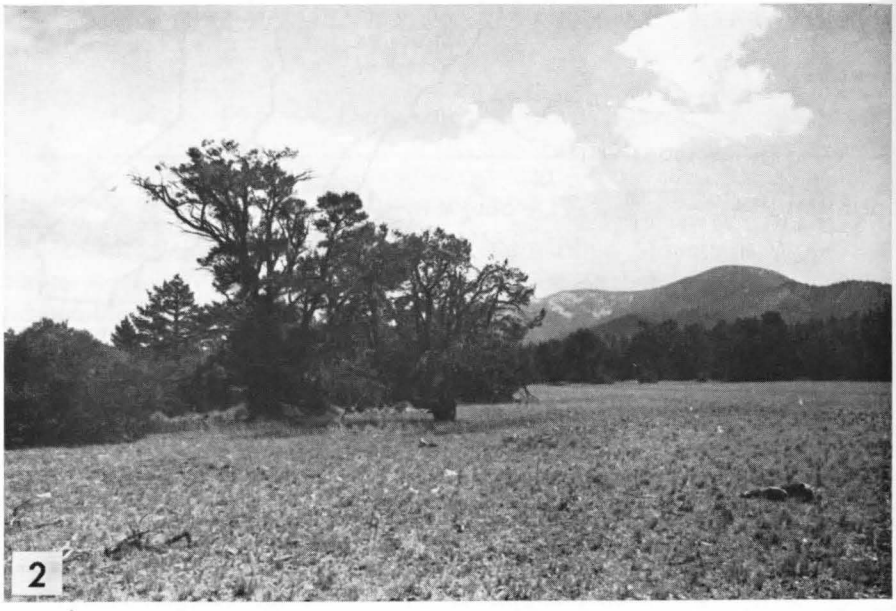

Fig. 2. Pavement-plain study site in the vicinity of Sawmill Canyon. Note the abrupt vegetational change between the pavement plain and the surrounding forest.

in floristic components. The few exceptions to this may be interpreted as former pavement-plain sites which have gradually been replaced by the forest, and still retain some of those more shade-tolerant pavement-plain species. Presently the phytosociology of the pavement plains is under study by staff of the San Bernardino National Forest.

The pavement-plain flora includes 31 species from 18 plant families, excluding "edge" species of forest or woodland. Nineteen species are perennials and 12 are annuals. Five species represent San Bernardino Mountain endemics and two of these, *Eriogonum kennedyi* Porter ex. Wats. ssp. *austromontonum* (M. & J.) Stokes and *Arenaria ursina* Rob., are pavement-plain endemics. Six species are included on the California Native Plant Society's list of rare and endangered plants (Powell, 1974). Nomenclature of plant species follows that of Munz (1974).

Plant species identified from the pavement plains during field work in 1977 are as follows:

Allium fimbriatum Wats. var. *fimbriatum*
Antennaria dimorpha (Nutt.) T. & G.
Arabis parishii Wats.[a, b]
Arenaria pusilla Wats. var. *diffusa* Maguire

Arenaria ursina Rob.[a, b]
Artemisia tridentata Nutt. ssp. *tridentata*
Astragalus purshii Dougl. var. *lectulus* Jones
Bouteloua gracilis (HBK) Lag.
Castilleja cinerea Gray[a, b]
Chaenactis glabriuscula DC. var. *curta* (Gray) Jeps.
Collinsia childii Parry ex Gray
Cryptantha simulans Greene
Draba douglasii Gray var. *crockeri* (Lemmon) C. L. Hitchc.
Dudleya abramsii Rose
Epilobium paniculatum Nutt. ex T. & G.
Erigeron aphanactis (Gray) Greene var. *congestus* (Greene) Cronq.
Eriogonum kennedyi Porter in Wats. ssp. *austromontanum* (M. & J.) S. Stokes[a, b]
Gilia diegensis (Munz) A. & V. Grant
Ivesia argyrocoma (Rydb.) Rydb.[b]
Lewisia redivia Pursh var. *minor* (Rydb.) Munz
Linanthus breviculus (Gray) Greene
Linanthus killipii Mason[a, b]
Lomatium nevadense (Wats.) Coult. & Rose var. *parishii* (Coult. & Rose) Jeps.
Nicrosteris gracilis (Dougl. ex Hook.) Greene ssp. *humilis* (Greene) V. Grant
Muhlenbergia minutissima (Steud.) Swall.
Plagiobothrys tenellus (Nutt.) Gray
Plantago purshii R. & S. var. *oblonga* (Morris) Shinners
Poa incurva Scribn. & Will.
Selaginella watsonii Underw.
Stipa elmeri Piper & Brodie ex Scribn.
Viola douglasii Steud.

[a] Endemic to San Bernardino Mountains.

[b] Included on the California Native Plant Society's rare and endangered plants list.

Literature Cited

Billings, W. D., and A. F. Mark. 1957. Notes and Comment: Factors involved in the persistence of montane treeless balds. Ecology 38:140–142.

Brown, Glenn and Associates. 1975. Geology and groundwater geology of Big Bear Valley, pp. 73–95. *In* Martin L. Stout (ed.), Geologic Guide to the San Bernardino Mountains, Southern California. California State University, Los Angeles.

Derby, Jeanine A. 1975. Sensitive plant locations, reports on file. San Bernardino National Forest, San Bernardino, California.

———. 1976. Sensitive plant management plan, report on file, San Bernardino National Forest, San Bernardino, California.

———. 1977. Sensitive plant management plan—revised 1977, report on file, San Bernardino, California.

Munz, Phillip A. 1974. A Flora of Southern California, University of California Press, Berkeley, California. 1086 p.

Powell, Robert. 1974. Inventory of Rare and Endangered Vascular Plants of California, Special Publication No. 1, California Native Plant Society, Berkeley, California. 56 p.

Stout, Martin L. 1976. Thrusting, landsliding and man, eastern San Bernardino Mountains, southern California. Geol. Soc. America Bull. 13:319–411.

Thorne, Robert F. 1976. Montane and subalpine forests of the Transverse and Peninsular Ranges, pp. 537–599. In Michael G. Barbour and Jack Major (eds.), Terrestrial Vegetation of California, John Wiley and Sons, New York.

(JAD) U.S. Forest Service, San Bernardino National Forest, San Bernardino, 92408; and (RCW) Department of Biology, California State College, San Bernardino 92407.