

**California Wildlife Habitat Relationships System  
California Department of Fish and Game  
California Interagency Wildlife Task Group**

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## Alpine Dwarf-Shrub

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### Vegetation

**Structure--**Alpine Dwarf-Shrub habitats typically are low graminoid and forb communities with an admixture of dwarf-shrubs (often cushion plants) (Kuchler 1977). The perennial herbs or dwarf shrubs comprising these communities are usually less than 0.5 m (18 in) tall (Cheatham and Haller 1975). Coverage may reach 100 percent at lower elevations but becomes increasingly open as elevation increases. On mesic sites, a continuous turf contrasts with patches of bunchgrasses and cushion plants on drier sites (Kuchler 1977).

**Composition--** Species composition varies considerably throughout California. The most common shrubs occurring are creambush oceanspray, Greene goldenweed and mountain white heather. These shrubs occur primarily in northern California and the Sierra Nevada. Creambush oceanspray also occurs commonly in the southern California mountains. The most common alpine shrub in the White Mountains is timberline sagebrush (Parker and Matyas 1981, Cheatham and Haller 1975). Nonshrub species that commonly occur in the alpine areas of northern California and the Sierra Nevada include Eschscholtz buttercup, primrose, prostrate sibbaldia, sedge, bluegrass, buckwheat, squirreltail, rock-cress, mountain sorrel, pussypaws, Indian paintbrush, Payson's draba, and Sitka romanzoffia (Parker and Matyas 1981, Cheatham and Haller 1975).

The following nonshrub species dominate the high Sierra: columbine, heart willowweed, Davidson's penstemon, Jacobs-ladder, and Coville phlox (Parker and Matyas 1981, Cheatham and Haller 1975).

The scattered alpine areas of the San Bernardino, San Gabriel and San Jacinto mountains are dominated by draba, Parish's alumroot, creambush oceanspray, silver raillardella, alpine Eschscholtz buttercup, wild onion, rock-cress, mariposa lily, and several species of buckwheat (Parker and Matyas 1981, Cheatham and Haller 1975).

The dominant nonshrub species in alpine areas of the White Mountains include timberline sagebrush, Scribner wheatgrass, several species of phlox, and Jacobs-ladder (Cheatham and Haller 1975).

**Other Classifications--** Other names for Alpine Dwarf-Shrub habitat include Dwarf Scrub (Alpine) Series (Parker and Matyas 1981), Alpine Community (Kuchler 1977), Alpine fell-field (Munz and Keck 1959) and Alpine fell-field cushion type (Thorne

1976). This habitat is included in Cheatham and Haller's Alpine Fellfields major subdivision under their Alpine Boulder and Rock Field habitat type. Cheatham and Haller (1975) further subdivide Alpine Fell-fields into 1) Klamath-Cascade, 2) Sierra Nevada, 3) Southern California, and 4) White Mountains Fell-fields.

## Habitat Stages

**Vegetation Changes--** 1:24,S-M. Following disturbance, Alpine Dwarf-Shrub habitats follow a slow successional process to any of the structural classes 1;2-4;S-M. There is limited information about the changes that occur in the plant communities comprising this habitat. Only limited autecological studies have been conducted (Mooney 1966, Billings and Mooney 1968, Billings 1975 Chabot and Billings 1972, Schultze et al. 1967(Schultze or Schulze listed as Schulze in Lit Cite), Johnson and Caldwell 1975, Ehleringer and Miller 1975), but insufficient comprehensive synecological work has been conducted to effectively describe the various successional stages and associated species in this habitat. Major and Taylor (1977) present an excellent review of the work on floristics and autecology of alpine communities.

**Duration of Stages--** Development of communities in this habitat proceeds quite slowly and does not attain great stature or complicated structure due to the harsh environmental conditions. The time required to proceed through the few successional stages is not known, but is dependent on the severity of the local environmental and soil conditions. Presumably, the structure and composition of the climax communities do not change substantially over time. Severe changes in weather patterns extended drought, for example or other environmental conditions landslide, mass-wasting, and destructive activities of animals or man usually result in the communities of this habitat reverting to earlier successional stages.

## Biological Setting

**Habitat--** The Alpine Dwarf-Shrub habitat is restricted to the highest elevations generally above timberline. At the lower elevational extent of this habitat, it normally interfaces with 1 ) Subalpine Conifer (SCN) and closed cone pine/cypress (CPC) habitats, 2) Subalpine Forest or Foxtail Pine Forest in the north, 3) Sierran Mixed Subalpine Forest in the Sierra Nevada, 4) Southern California Subalpine Forest and 5) Bristlecone Pine Forest in the White Mountains. The Alpine Dwarf-Shrub habitat vegetation may sometimes constitute part of the Bristlecone Pine Forest where they intergrade. The Alpine Dwarf-Shrub habitat often intergrades with Alpine Talus and Scree Slopes in the summit regions of southern California mountains. This habitat also intergrades quite broadly with Subalpine Sagebrush in the White Mountains (Cheatham and Haller 1975).

**Wildlife Considerations--** Birds common in this habitat (or adjacent alpine meadows) include blue grouse, rufous hummingbird, mountain bluebird and gray-crowned rosy finch. Mammals in this habitat include the Mount Lyell shrew, broad-footed mole, pika,

white-tailed jackrabbit, yellow-bellied marmot, Belding's ground squirrel, northern pocket gopher or mountain pocket gopher, and mountain sheep (Storer and Usinger 1963).

## Physical Setting

Generally, the Alpine Dwarf-Shrub habitat is found above timberline on all aspects, slopes, and ridge lines, so the physical environment tends to be cold, dry, and windy. In the northern portion of California, this habitat is cold with a brief summer growing season. This habitat is subject to intense solar radiation and freezing nights in summer. It is subject to severe winds and very low temperatures in winter on windward slopes, which are often blown clear of snow. Protected slopes often have persistent snowdrifts until midsummer or later. The substrate is quite rocky with little soil formation and excellent drainage. Plants in this habitat are subject to desiccation by midsummer after meltwater disappears.

In northern California, this habitat is cold with a brief summer growing season and is somewhat drier and cooler in the Sierra Nevada. In southern California, the habitat is less cold and accumulates less snow than the Sierra Nevada so it tends to be drier. It is also subject to severe winds from fall through spring. In the White Mountains, this habitat has much less snow, so it is significantly drier and colder than in the Sierra Nevada (Cheatham and Haller 1975).

The growing season occurs July and August in northern California and along the Sierra Nevada. Here, the growing season is often delayed until the beginning of August because of heavy snow accumulation. The growing season can also be limited by drought. The growing season in southern California normally begins in June (Cheatham and Haller 1975).

## Distribution

This habitat is found only in the highest elevations in California (see map). Toward the north, it is found on the highest peaks of the Klamath Range, usually above 2270 m (7500 ft). It is also found on Mt. Shasta and Mt. Lassen from 2580 to 3180 m (8500 to 10,500 ft) and occasionally higher (Cheatham and Haller 1975). In the Sierra Nevada, it is confined to the highest peaks, from Lake Tahoe to Yosemite, usually above 2575 m (8500 ft). From that point southward, it is almost continuous along the Sierra Nevada crest to Olancho Peak (Tulare-Inyo county line). Toward the southerly extent along the Sierra Nevada, this habitat is found above 3480 m (11,500 ft). In southern California, it is confined to the summit region and adjoining ridge lines above 3030 m (10,000 ft) in the San Bernardino, San Gabriel, and San Jacinto mountains. Alpine Dwarf-Shrub is almost continuous along the main ridge of the White Mountains above 3480 m (11,500 ft) (Cheatham and Haller 1975).

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