

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

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## Sagebrush

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## Vegetation

**Structure--** Sagebrush stands are typically large, open, discontinuous stands of big sagebrush of fairly uniform height. Big sagebrush tends to have a single short, thick, stem that branches into a nearly globular crown. Plant heights range from 0.5 to 3 m (1.6 to 9.8 ft) and density ranges from very open, widely spaced, small plants to large, closely spaced plants with canopies touching. In addition to a deep root system, big sagebrush has a well developed system of lateral roots near the soil surface. Consequently, the plants almost completely use the edaphic potential of a site, excluding most other plants in an area up to three times their crown area. This produces stands with shrubs of very uniform size and spacing. Sagebrush is often mixed with other species of shrubs of similar form and growth habit. In better sites, sagebrush stands have an understory of perennial grasses and forbs. At higher elevations, big sagebrush occurs as an understory in conifer stands.

**Composition--** Often the habitat is composed of pure stands of big sagebrush, but many stands include other species of sagebrush, rabbitbrush, horsebrush, gooseberry, western chokecherry, curlleaf mountain mahogany, and bitterbrush. Munz (1959)(No Munz 1959 in Habitat Lit Cite. I put Munz and Keck 1959 in Lit Cite at end.) lists 15 species and 6 subspecies of sagebrush as occurring in California. The subspecies differences are manifested in minor morphological and adaptive characteristics. As topography, soil composition, and moisture change through the sagebrush type, the dominant species of sagebrush changes. On low flats with shallow soils and restricted drainage low sagebrush is dominant. Where the soil remains saturated through the spring, silver sagebrush dominates. Black sagebrush dominates sites with soils high in gravel and carbonates. In communities not fully occupied by sagebrush, various amounts of herbaceous understory are found. Idaho fescue, bluebunch wheatgrass, several species of needlegrass, squirreltail, Sandberg bluegrass, and Great Basin wildrye are among the more common grasses found in the habitat. After disturbance and during years with excess moisture, annual grasses such as cheatgrass and medusahead invade sagebrush stands. At higher elevations sagebrush occurs as an understory with mountain mahogany, pinyon, juniper, and ponderosa pine.

**Other Classifications--** This type coincides fairly well with the Sagebrush Scrub plant community described by Munz and Keck (1970)(No Munz and Keck 1970 in Habitat Lit Cite. I put Munz and Keck 1973 in Lit cite at end.). Young et al. (1977) include all but the highest elevations of the habitat in their description of the Sagebrush

Steppe. It combines the Sagebrush Steppe, Juniper Shrub Savanna, and the Blackbrush Scrub types of Küchler (1977) and the Sagebrush, Basin Sagebrush, and Blackbrush types of Parker and Matyas (1979).

## Habitat Stages

**Vegetation Changes--** 1;24:S-D. The sagebrush habitat can exist in any of the structural stages. The most common disturbance factors are wildfire, prescribed burning, seeding to grasses, livestock grazing, and defoliation by larvae of the sagebrush defoliator moth. Stable sagebrush habitats with little herbaceous understory are relatively fire resistant. However, stands subjected to heavy grazing are often invaded by annual grasses and are highly flammable. Stands killed or severely damaged by the larvae of the sagebrush defoliator moth are also subject to wildfire. The effects of fire in the sagebrush habitat have been well documented by several authors including Blaisdell (1953) and Young and Evans (1974). Big sagebrush does not sprout after burning but most of the other shrubs common to the type do. The result for as long as 20 years after fire may be a community dominated by rabbitbrush, horsebrush, and grasses. A very hot fire in a degraded site may result in a seral community dominated by annual grasses and forbs. Perennial bunchgrasses frequently survive fires and become dominant. Short-lived perennial grasses, such as bottlebrush squirreltail and Sandberg bluegrass, may be the next seral stage after disturbance, depending on conditions. Under protection or moderate grazing these seral communities are usually replaced by climax perennial bunchgrasses and open stands of sagebrush. Man has frequently changed succession in this habitat with prescribed burning or mechanical removal of sagebrush, followed by seeding of introduced bunchgrasses to improve the carrying capacity for livestock.

**Duration of Stages--** Sagebrush usually reaches a fairly stable dominance in 10 to 20 years after disturbance, with or without an understory of perennial bunchgrass. Sagebrush usually remains dominant indefinitely or until the next disturbance.

## Biological Setting

**Habitat--** Sagebrush occurs at a wide range of middle and high elevations. At lower elevations and on drier sites, it gives way to such species as saltbrush, greasewood, creosotebush, and winterfat. At mid-elevations and on more mesic sites the habitat meets bitterbrush, curlleaf mountain mahogany, and western serviceberry. At high elevations it intergrades with Ponderosa Pine (PPN) and even with Aspen (ASP) habitat types.

**Wildlife Considerations--** The Sagebrush type is very important to wildlife because it serves as habitat for some of the more important game animals and occupies such a vast area. It is a major winter-range type for migratory mule deer, and many herds summer in Sagebrush-Ponderosa Pine complexes at middle and high elevations. The sagebrush and its included Low Sagebrush and Bunchgrass types are the principal habitats for pronghorns. The sage grouse is dependent on various successional stages of the type all

year. It is also occupied by jackrabbits, cottontail rabbits, ground squirrels, least chipmunk, kangaroo rats, wood rats, pocket mice, deer mice, grasshopper mice, sagebrush vole, and the California bighorn sheep. Birds of the sagebrush type include the chukar, black-billed magpie, gray flycatcher, pinyon jay, sage thrasher, and several sparrows, and hawks. Maintenance of the type is essential for many of these species. Some can benefit from the increased diversity and forage created by the careful use of fire, mechanical brush removal, seeding, or grazing (Urness 1976 (No Urness 1976 in Habitat Lit Cite. I put Urness 1979 for Lit cite at end.), Neal 1981). Endangered species found in the Sagebrush type include the peregrine falcon, bald eagle, Lost River sucker, shortnosed sucker, Owens River pupfish, and Owens tui chub. Threatened species are the Lahontan and Paiute cutthroat trouts.

## Distribution

The Sagebrush habitat is a discontinuous strip along the east and northeast borders of California south to the 37th parallel. It occupies dry slopes and flats from about 500 m (1600 ft) to 3200 (10,500 fl) in elevation.

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