

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

Low Sage

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Vegetation

Structure-- This habitat is generally dominated by broad-leaved, evergreen shrubs ranging in height from about 0.1 to 0.5 m (4 to 19 in), typically averaging about 15 percent cover (Küchler 1977) but sometimes with crowns touching (Cheatham and Haller 1975). Deciduous shrubs and small trees are sometimes sparsely scattered within this type. A ground cover of grasses and forbs is typically sparse 5 to 15 percent coverage (Küchler 1977) .

Composition-- Young et al. (1977) provide the best qualitative descriptions. The habitat may be dominated by either low sagebrush or black sagebrush, often in association with Douglas rabbitbrush, antelope bitterbrush, or big sagebrush; black sagebrush is also commonly associated with winterfat and Mormon-tea. Western juniper may be sparsely scattered in stands dominated by low sagebrush, and Utah juniper and singleleaf pinyon are sometimes scattered in stands dominated by black sagebrush. Common grass species include Sandberg bluegrass, bluebunch wheatgrass, bottlebrush squirreltail, Thurber needlegrass, and Idaho fescue. A rich variety of forbs is usually present. The abundance and distribution of associated plants is highly influenced by soils and precipitation.

Other Classifications-- This type includes the various *Artemisia arbuscula* and *A. nova* communities of Young et al. (1977), the Low Sagebrush community of Parker and Matyas (1979), and the Subalpine Sagebrush subdivision of Cheatham and Haller (1975). It is a component of the Sagebrush Steppe of Küchler (1977).

Habitat Stages

Vegetation Changes-- 1;2J:S-M. According to Young et al. (1975), "Wildfire, grazing by large herbivores, and defoliation by larvae of the moth *Aroga websterii* undoubtedly contributed to stand renewal in the pristine sagebrush steppe of California." However, disturbance of these habitats today apparently results in their replacement by other relatively stable plant communities, completely changing their successional pattern. Indeed, Young et al. (1977:780) report that cheatgrass has invaded all potential sagebrush steppe communities of northeastern California, changing "succession in an entire vegetation type." Young and Evans (1970) found that overgrazed stands are reduced to stark shrub communities with much bare ground between the low shrubs. Such stands are

readily invaded by medusahead and some cheatgrass, increasing their susceptibility to wildfires. Thus, if the non-sprouting shrubs are destroyed, the site becomes dominated by medusahead.

Duration of Stages. This habitat may occur as any of the structural classes. However, because disturbance typically results in replacement of native plant communities by stable communities of invading exotic species, little opportunity has been available to study the duration of types under a regime of natural succession. This subject is much in need of research.

Biological Setting

Habitat-- This type commonly forms ecotones with the Sagebrush, Pinyon-Juniper, and Juniper habitats in northeastern California. Indeed, it may be difficult to determine the correct classification of some sites. "On the Modoc Plateau, *A. arbuscula* communities are common as openings within the coniferous forest" (Young et al. 1977:780). They may thus be found adjacent to Mixed Conifer, Jeffrey Pine, or Ponderosa Pine forests. Climatic changes result in periodic shifting of these ecotones (e.g., Mehringer 1967), a relationship that is further complicated by invasion of coniferous woodlands into sagebrush habitats in response to fire suppression and grazing by domestic livestock (Burkhardt and Tisdale 1969, Blackburn and Tueller 1970).

Wildlife Considerations-- Excluding species dependent on ponds lakes, marshes, and cliffs commonly found in northeastern California, Laudenslayer (1982) lists 28 species of terrestrial vertebrates that find conditions optimum for breeding in typical stands of LSG (<20% shrub cover), including chukar, burrowing owl, rock wren, and pronghorn. He lists 37 additional species that find conditions suitable for breeding in typical stands, including sage grouse, mourning dove, and kit fox. In addition, several species of raptorial birds find ideal hunting grounds in stands of low sagebrush. These stands tend to lose their snow cover earlier in spring than surrounding habitats; thus they provide an especially important source of new, green forage for pronghorn and mule deer (D. L. Neal, pers. comm.).

Physical Setting

LSG occurs in areas with cold, harsh winters and hot, dry summers. Precipitation generally ranges from 20 to 46 cm (8 to 18 in), falling mostly as snow from December through March. Mean summer maximum temperatures range from 28 to 35 C (83 to 95 F); mean winter minima range from 13 to 3 C (8 to 27 F) (Munz and Keck 1959). Stands of low sagebrush are "usually found on shallow soils with impaired drainage in the transition zone between the wetter bottom and open timber on the mountainsides" (Hormay and Talbot 1961:6). The type also occurs on terraces with hardpan or heavy clay soils. In mosaics formed with bitterbrush, low sagebrush occurs on harsher sites with shallow, well-drained soils, and bitterbrush occupies areas with deeper soils (Parker

and Matyas 1979). The clay-rich soils yield much of their snowmelt as runoff, making them very important watershed areas (Young et al. 1977). Zamora and Tueller (1973) speculate that perched water tables in spring, which result in poor aeration in the rooting zone of low sagebrush, may be significant in the ecology of the LSG habitat. Soils typically associated with stands of black sagebrush are shallow, contain a high percentage of gravel, and are rich in mineral carbonates (Young et al. 1977). Black sagebrush is prevalent on limestone soils (Hironaka 1963, St. Andre et al. 1965).

Distribution

Low sagebrush communities are generally restricted to elevated arid plains along the eastern flanks of the Sierra Nevada, from Inyo County northward through Modoc and Siskiyou Counties. The subalpine stage dominated by black sagebrush is especially well developed in the White and Inyo Mountains, at elevations from 2420 to 3330 m (8000 to 11,000 ft) (Cheatham and Haller 1975). Stands dominated by low sagebrush range in elevation from 1210 to 2740 m (4000 to 9000 ft) (Munz and Keck 1959), and are perhaps best developed in forest openings on the Modoc Plateau.

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