

Coastal Sage Scrub

VEGETATION ASSOCIATION: COASTAL SAGE SCRUB

MAPPED SUBASSOCIATIONS: Diegan Coastal Sage Scrub
Riversidean Sage Scrub
Undifferentiated Coastal Scrub

OTHER CLASSIFICATIONS: Riversidean Upland Sage Scrub (Holland)
Coastal Sage-Chaparral Scrub (Holland)
Black Sage Series (Sawyer & Keeler-Wolf)
California Buckwheat Series (Sawyer & Keeler-Wolf)
California Buckwheat-White Sage Series (Sawyer & Keeler-Wolf)
California Sagebrush Series (Sawyer & Keeler-Wolf)
California Sagebrush-Black Sage Series (Sawyer & Keeler-Wolf)
Mixed Sage Series (Sawyer & Keeler-Wolf)
Purple Sage Series (Sawyer & Keeler-Wolf)
White Sage Series (Sawyer & Keeler-Wolf)

DATA CHARACTERIZATION

The data set for coastal sage scrub within the Plan Area is fairly complete.

BIOGEOGRAPHY

Coastal sage scrub is represented by several major associations that occur discontinuously from the San Francisco Bay area south to El Rosario in Baja California, Mexico. Some classification systems are based on dominant species (*e.g.*, Holland 1986; Sawyer and Keeler-Wolf; White and Padley 1997), while others are based on geographic location (*e.g.*, Axelrod 1978; Westman 1982). The most commonly cited geographic-based associations include those of Axelrod (Franciscan, Diablan, Lucian, Venturan, Diegan, and Riversidean) and Westman (Diablan, Venturan, Riversidean, Diegan, Martirian, and Vizcainan). Coastal sage scrub is found most extensively at lower elevations of coastal southern California, but occurs up to 1300 m in elevation in the Coast Ranges. It transitions into to Mojave desert vegetation to the east and to Sonoran vegetation in Baja California, Mexico (Axelrod 1978; Westman 1981).



Coastal Sage Scrub

RANGE AND DISTRIBUTION WITHIN WESTERN RIVERSIDE COUNTY

Riversidean sage scrub is distributed throughout Western Riverside County, occupying approximately 159,000 acres (12 percent) of the Plan Area (PSBS 1995) where it is represented by three subassociations: Diegan coastal sage, Riversidean sage scrub and coastal scrub. It occurs from the eastern slopes of the Santa Ana Mountains to elevations in the San Jacinto Mountains less than 5,000 feet. Mapped boundaries between the subassociations are complicated and can be the result of different map source data or differences in dominant species composition. Intergradation between the subassociations near mapped boundaries exists and is dependent on distance inland (east), slope-aspect, elevation, and fire/ disturbance history.

VEGETATION CHARACTERISTICS

Coastal sage scrub is dominated by a characteristic suite of low-statured, aromatic, drought-deciduous shrubs and subshrub species. Composition varies substantially depending on physical circumstances and the successional status of the Habitat, however, characteristic species include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), California encelia (*Encelia californica*), and several species of sage (e.g., *Salvia mellifera*, *S. apiana*) (Holland 1986; Sawyer-Wolf 1995). Other common species include brittlebush (*E. farinosa*), lemonadeberry (*Rhus integrifolia*), sugarbush (*Rhus ovata*), yellow bush penstemon (*Keckiella antirrhinoides*), Mexican elderberry (*Sambucus mexicana*), sweetbush (*Bebbia juncea*), boxthorn (*Lycium* spp.), shore cactus (*Opuntia littoralis*), coastal cholla (*O. proliferata*), tall prickly-pear (*Opuntia oricola*), and species of *Dudleya*. Sage scrub often is patchily distributed throughout its range (O'Leary 1992). Over a scale of several miles, it can be found in diverse Habitat mosaics with other plant communities, particularly grassland and chaparral, and oak/riparian woodland in more mesic areas. Coastal sage scrub may convert to chaparral or grassland, depending on slope, aspect, climate, fire history, and other physical factors and biological phenomena; conversely, chaparral or grassland areas may convert to coastal sage scrub (Axelrod 1978; White 1995; O'Leary 1995; Allen *et al.* 1998).

According to Westman (1982), all coastal sage scrub in Riverside County is contained in the Riversidean subassociation, however, a recent classification of sage scrub in Western Riverside County (White and Padley 1997) has identified seven subassociations (or series) based upon dominant shrub cover. These series include California sagebrush, California buckwheat, California sagebrush-California buckwheat, California sagebrush-white sage, brittlebush, black sage, and deerweed. A number of researchers now are stressing the need for consideration of such variation in Conservation planning and in order to make sound



Coastal Sage Scrub

management decisions (DeSimone and Burk 1992; Read 1994; Weaver 1998; White and Padley 1997)

PHYSICAL ENVIRONMENT

Coastal sage scrub typically is found on xeric sites, notably steep, south-facing slopes with thin and/or rocky soils. It also is found on exposed sea bluffs, coastal and river terraces composed of coarse alluvial outwash, and coastal dunes (Axelrod 1978). The more open nature of the canopy permits persistence of a diverse herbaceous component of forbs, grasses, and succulents in mature stands than usually is associated with chaparral. It often is interdigitated with chaparral and grassland communities and the distinct boundaries between each can sometimes be difficult to delineate.

ECOSYSTEM PROCESSES

As one of the Habitats that has evolved in a Mediterranean climate, it generally is assumed, based upon studies conducted in chaparral, that coastal sage scrub is adapted to periodic wildfire disturbance. These inferences should not be generalized to all coastal sage scrub as there is a number of characteristics in coastal sage scrub that differ from chaparral which could affect fire ecology. Sage scrub's resilience to periodic wildfire is not completely understood but seems to be a product of the reproductive strategies of the constituent species and the nature of the fire regime. Coastal sage scrub has lower shrub cover, higher volatile oil content, greater cover by herbaceous (or understory) species, shorter duration of nitrogen-fixing species, and more marked variation in post-fire sprouting patterns (Westman *et al.* 1981). Typically, coastal sage scrub has much less standing biomass and litter accumulation and constituent shrub species also are capable of continual reproduction by seed, unlike chaparral species. There appears to be a difference in recovery strategy dependent upon the geographic locations of the coastal sage scrub and, perhaps, fire regimes (White 1995). In coastal areas, most sage scrub species resprout from below ground root crowns, although there can be substantial seedling germination. This is not the case in inland areas where there is little or no regeneration from sprouting and virtually all recovery is dependent upon seed germination. Habitat recovery in these areas is low. This may be due to an adaptation to a fire interval that was longer than occurs today or that these species once were more effective in recolonizing from seed. Coastal sage scrub assemblages that regenerate primarily by seeding may be inherently more vulnerable to the effects of non-natives than stands that regenerate by sprouting (O'Leary 1990, White 1995) which has management implications which should be considered in Conservation planning.



Coastal Sage Scrub

Wildfires and controlled burns occur with increasing frequency in southern California (Zedler *et. al.* 1983). High fire frequency (*i.e.*, short intervals between fires) may alter permanently the floristic composition and structure of a site, including the extirpation of weak resprouting species such as California sagebrush (Malanson and O'Leary 1982). Fires at five to ten year intervals may result in type conversion from chaparral to coastal sage scrub (Keeley 1987; O'Leary, Murphy, Brussard 1992). Type conversion from coastal sage scrub or chaparral to grassland may be accomplished by repeated burning in successive or alternate years (Zedler *et. al.* 1983).

AREA PLAN SUBREGIONS

Riversidean sage scrub is the dominant sage scrub subassociation in the Plan Area, occupying approximately 10.3 percent (136,278 acres) of the Plan Area; it occurs in all of the Area Plans except Eastvale and on March Air Force Base. It is common in the Gavilan Hills, Steele Peak, above Canyon Lake along the San Jacinto River, Wildomar, Lake Skinner, north of Temecula Creek at Vail Lake, Lake Perris, and Lakeview Mountains areas, and along the Peninsular Mountain foothills from the Badlands southeast to the Soboba Indian Reservation. Smaller but significant stands of Riversidian sage scrub also are scattered throughout the Plan Area .

Diegan coastal sage scrub is distributed in the westernmost portion of the Plan Area within an area generally bounded by the Santa Ana River (south of SR 91), Interstate 15, Temecula Creek (near State Route 79), and the Santa Ana Mountains. The majority occurs southwest of Temecula and also in the Temescal, Greater Elsinore, and Southwest Area Plans. It occupies 1.2 percent (15,805 acres) of the Plan Area.

Undifferentiated coastal scrub occupies less than one percent (0.46 percent; 7,159 acres) of the Plan Area. This subassociation occurs at the higher elevations of the Plan Area, and was mapped primarily south of Banning-Beaumont Pass, northeast of Soboba Hot Springs, as well as in scattered patches between Bautista Creek and Mountain Center.

THREATS

O'Leary (1995) cites several threats to coastal sage scrub rangewide: fragmentation (including edge effects), invasion of non-native species, altered fire cycle, and air pollution. In addition to these, Minnich and Dezzani (1998) include, for Western Riverside County, land clearing, grazing, and competitive exclusion (in conjunction with grazing and altered fire cycles).



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Coastal Sage Scrub

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