



## Crestridge Ecological Reserve Vegetation Communities

<u>Vegetation Community</u>	<u>Acres*</u>
Southern Mixed Chaparral	1,757.8
Coastal Sage Scrub	443.7
Coast Live Oak Woodland	125.1
Scrub Oak Chaparral	25.0
Nonnative (Annual) Grassland	14.8
Disturbed Areas	11.8
Coast Live Oak Riparian Woodland	7.9
Freshwater Seep	0.4
Eucalyptus Woodland	0.1
Total	2,386.6

\* Habitat acreage only includes acquisitions prior to 2002.

### Scrub and Chaparral Communities

**Coastal Sage Scrub (32500).** Diegan coastal sage scrub occurs primarily in the central and western portions of the reserve, on all slope exposures. It occurs on flat or gently sloping areas adjacent to drainages, as well as on steep slopes. Dominant species include California sagebrush (*Artemisia californica*), laurel sumac (*Malosma laurina*), and California buckwheat (*Eriogonum fasciculatum*). Shifts in species dominance, or the presence of additional shrub species, appear to be related to slope and disturbance factors. For example, San Diego County viguiera (*Viguiera laciniata*) is a common constituent of scrub habitat on south and west-facing slopes, while white sage (*Salvia apiana*) is locally dominant in gabbro-derived (Las Posas) soils on south and west-facing slopes above Rios Canyon. Subdominant coastal sage scrub shrubs include broom baccharis (*Baccharis sarothroides*), bushrue (*Cneoridium dumosum*), holly-leaf redberry (*Rhamnus ilicifolia*), and yellow bush penstemon (*Keckiella antirrhinoides*). Small patches of coastal sage scrub are scattered throughout the eastern portion of the reserve, where they often occur within a matrix of chaparral. Many of these patches include chaparral species. In these cases, polygons were categorized as scrub only where scrub species were visually dominant within the patch.

In general, coastal sage scrub onsite is relatively undisturbed. Disturbed scrub was mapped in the vicinity of the former racetrack, an area in the eastern portion of the site that has been heavily disturbed by off-road vehicles. Off-road vehicle activity has resulted in both fragmentation and loss of scrub habitat in this area. Coastal sage scrub on west-facing slopes above Rios Canyon also shows signs of disturbance, which may be due to a combination of fire frequency, surface disturbance, and proximity to a



source of invasive plant propagules. Two to three fire events have been recorded on these slopes, and several utility access roads and trails occur through the area. In addition, a fuel break along lower slopes is adjacent to residential development and may function as a conduit for invasive plant species. As a result, coastal sage scrub on these west-facing slopes supports a moderate to dense understory of nonnative species, including tocalote (*Centaurea melitensis*) on lower slopes and purple falsebrome (*Brachypodium distachyon*) on upper slopes. African fountain grass (*Pennisetum setaceum*) is beginning to invade this area, as well. For the most part, disturbance in this area is not severe enough to warrant a disturbed modifier. Invasive species should be monitored and managed in this area, however, to ensure that they do not threaten the native habitat or populations of sensitive species. Coastal sage scrub comprises 443.7 acres of vegetation onsite. Of this total, 0.5 acre has been categorized as disturbed due primarily to off-road vehicle activity.

Coastal sage scrub onsite can be classified into a number of coastal scrub series under the CNDDDB's most recent vegetation classification scheme (CNDDDB 1999). These include the California sagebrush scrub series (32.010.00), white sage scrub series (32.030.00), California buckwheat scrub series (32.040.00), California sagebrush-California buckwheat scrub series (32.110.00), and Diegan coastal sage scrub series (32.200.00). Only a small portion of the scrub habitat onsite, however, can be further assigned into a CNDDDB association (e.g., California sagebrush, 32.010.01). Most of the coastal sage scrub on the reserve consists of combinations of species not yet recognized as associations. Examples include habitat dominated or co-dominated by laurel sumac or San Diego County viguiera. With the exception of white sage scrub, the CNDDDB (1999) does not consider any of the coastal scrub series onsite as high priorities for inventory (e.g., rare and worthy of consideration). Coastal sage scrub is, however, considered regionally sensitive due to both the acreage lost to urban expansion and the number of sensitive species that this habitat supports.

**Southern Mixed Chaparral (37120).** Southern mixed chaparral is the dominant vegetative association on Crestridge and is particularly widespread in the eastern and western portions of the reserve. It occurs on all slope exposures and in many areas is further characterized by the presence of very large and extensive rock outcroppings. This association is comprised of broad-leaved sclerophyllous shrubs to about 3 m in height (Holland 1986; Sawyer and Keeler-Wolf 1995). Species dominance varies throughout the reserve, but the most common shrub species include chamise (*Adenostoma fasciculatum*), Ramona lilac (*Ceanothus tomentosus*), laurel sumac, scrub oak, and mission manzanita (*Xylococcus bicolor*). Both Lakeside ceanothus and hoaryleaf ceanothus (*Ceanothus crassifolius*) are locally common to abundant in the eastern part of the reserve. Subdominant shrubs or occasional components of southern mixed chaparral include chaparral whitethorn (*Ceanothus leucodermis*), bigberry manzanita (*Arctostaphylos glauca*), San Diego mountain-mahogany (*Cercocarpus*



minutiflorus), toyon (*Heteromeles arbutifolia*), Our Lord's candle (*Yucca whipplei*), and poison-oak (*Toxicodendron diversilobum*).

Very little disturbed southern mixed chaparral was mapped on Crestridge. In most cases, a disturbed modifier was used only where chaparral had been cleared recently for fuel breaks. In these areas, recent clearing appears to have resulted in an increase in annual species diversity, which is likely related to increased light conditions. Repeated and long-term clearing of chaparral, however, is expected to eventually result in decreased species diversity and promote invasion of nonnative species into the reserve. Southern mixed chaparral accounts for 1,757.8 acres of vegetation onsite. Of this total, 12.8 acres were described as disturbed.

Some of the southern mixed chaparral can be classified into existing CNDDDB chaparral series, such as the chamise-hoaryleaf ceanothus chaparral series (37.107.00), chamise-mission manzanita-woollyleaf ceanothus chaparral series (37.109.00), and scrub oak-chamise chaparral series (37.409.00). However, a significant portion of the chaparral onsite cannot be placed into existing series, based on species composition. Likewise, some (but not all) of the chaparral habitat onsite can be further assigned a CNDDDB association (e.g., chamise-hoaryleaf ceanothus, 37.107.01; chamise-mission manzanita, 37.109.01; chamise-mission manzanita-woollyleaf ceanothus, 37.109.02; chamise (woollyleaf ceanothus), 37.109.04; and scrub oak-chamise-(hoaryleaf ceanothus), 37.409.01). Much of the chaparral habitat onsite consists of combinations of species not yet recognized as associations. The CNDDDB (1999) considers at least one of the series onsite (chamise-mission manzanita-woollyleaf ceanothus chaparral, 37.109.00) to be a high priority for inventory (e.g., rare and worthy of consideration). In general, chaparral is not considered sensitive except where it supports populations of sensitive species.

**Scrub Oak Chaparral (37900).** Scrub oak chaparral is a dense, evergreen chaparral to about 6 m in height, dominated by scrub oak. Scrub oak chaparral typically occurs in more mesic areas than other chaparral associations, often at slightly higher elevations (Holland 1986). This habitat can occur on all slope exposures in deep or shallow soils that may be rocky. The understory layer is typically sparse to lacking (Sawyer and Keeler-Wolf 1995). Although scrub oak occurs throughout the reserve, scrub oak chaparral was mapped in only one location. A large stand of scrub oak chaparral occurs in the western portion of the reserve, on lower slopes south of and adjacent to the unnamed drainage through this area. The criterion for categorizing habitat as scrub oak chaparral was >50% percent cover of scrub oak. Scrub oak comprised about 70-80% of the shrub layer where it was identified as a distinct habitat onsite. Dense stands of laurel sumac superficially resembled scrub oak chaparral on the ADAR imagery. In these cases, field verification was required to determine species composition. Scrub oak chaparral comprises 25 acres of vegetation on Crestridge.



Scrub oak chaparral onsite corresponds to the CNDDDB scrub oak chaparral (37.407.02) association. The CNDDDB (1999) does not consider this association to be a high priority for inventory (e.g., rare and worthy of consideration), nor is it considered regionally sensitive except where it supports populations of sensitive species.

## Grasslands and Other Herb Communities

**Annual (Nonnative) Grassland (42200).** Annual grassland is a relatively uncommon vegetation community on Crestridge. This association occurs primarily in areas of level topography in the central and central-eastern portions of the reserve and appears to be the result of disturbance. Annual grassland is characterized by a sparse to dense cover of low (<1 m) annual grasses and native and nonnative herbaceous species (Holland 1986; Sawyer and Keeler-Wolf 1995). Common nonnative grassland species on Crestridge include soft chess (*Bromus hordeaceus*), ripgut grass (*Bromus diandrus*), oats (*Avena* spp.), long-beak filaree (*Erodium botrys*), and black mustard (*Brassica nigra*), among others. The largest expanse of annual grassland onsite occurs just east of the oak grove at the end of Horsemill Road. Grassland in this area may be a result of past clearing or grazing activities. Annual grassland in the vicinity of the previous racetrack appears to be related to soil disturbances associated with off-road vehicle activity. Annual grassland accounts for 14.8 acres of vegetation on the reserve.

Annual grassland onsite corresponds to the CNDDDB California annual grassland (42.040.00) series and, in part, to the slender oat-soft brome (42.040.01) association. The CNDDDB (1999) does not consider this association to be a high priority for inventory (e.g., rare and worthy of consideration), nor is it considered regionally sensitive except where it supports populations of sensitive species.

**Freshwater Seep (45400).** Freshwater seep is also uncommon on Crestridge and was mapped only in the vicinity of the former racetrack. This vegetative association occurs in moist or wet soils, and many of the plants in this community are wetland indicators (USFWS 1996). Freshwater seep is typically dominated by low-growing (<1 m tall) herbaceous perennial species that form a continuous or open canopy (Holland 1986; Sawyer and Keeler-Wolf 1995). Species found in freshwater seep habitat on Crestridge include western ragweed (*Ambrosia psilostachya*), deergrass (*Muhlenbergia rigens*), sedge (*Carex* sp.), willow dock (*Rumex salicifolius*), Mariposa rush (*Juncus dubius*), Mexican rush (*Juncus mexicanus*), everlasting (*Gnaphalium* sp.), goldenrod (*Solidago* sp.), long-beak filaree, totalote (*Centaurea melitensis*), soft chess, and Spanish-clover (*Lotus purshianus*).

Freshwater seep accounts for an estimated 0.4 acre on the reserve, and most of this acreage (95%) was mapped as disturbed. Intensive off-road vehicle activity through this habitat has resulted in fragmentation and promoted invasion by nonnative species through soil disturbance and the introduction of nonnative propagules. In addition, it



appears that intentional mounding of soil in this area to enhance the off-road vehicle experience has filled some areas that were likely freshwater seep.

Freshwater seep onsite corresponds to the CNDDDB series of 'meadows and seeps not dominated by grasses' (45.000.00). Sedges are currently one of the more dominant native species in this habitat, which is possibly best characterized as a sedge association (45.110.00). Due to the level of disturbance, however, this association determination is considered tentative. None of the meadow and seep sedge or rush species present or likely to be present on Crestridge is considered a high inventory priority by the CNDDDB (1999). However, this association is likely a wetland and thus would be considered sensitive by the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (ACOE), CDFW, and local jurisdictions.

## Forest and Woodland

**Southern Coast Live Oak Riparian Forest (61310).** This association is an open to locally dense riparian woodland dominated by coast live oak (*Quercus agrifolia*). It occurs in valley bottoms and outer floodplains along larger streams, in sandy soils or alluvium (Holland 1986; Sawyer and Keeler-Wolf 1995). On Crestridge, this association is restricted to well-developed but typically narrow drainages. Other riparian tree species, such as western sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*), black willow (*Salix gooddingii*), and arroyo willow (*Salix lasiolepis*) also occur in this association. Engelmann oak (*Quercus engelmannii*) occurs in or adjacent to this association in a few locations onsite, and scattered eucalyptus trees are present as well. Riparian shrubs such as mulefat (*Baccharis salicifolia*) and the nonnative tamarisk (*Tamarix* sp.) occasionally occur in the understory. In well-developed stands of southern coast live oak riparian forest, poison-oak (*Toxicodendron diversilobum*) is a common understory constituent, as is San Diego sagewort (*Artemisia palmeri*). The herbaceous layer sometimes includes species such as rushes, California polypody (*Polypodium californicum*), western ragweed, California goldenrod (*Solidago californica*), and San Diego sedge (*Carex spissa*), among others. Southern coast live oak riparian forest comprises 7.9 acres of vegetation on the reserve.

Southern coast live oak riparian forest on Crestridge corresponds to the CNDDDB southern coast live oak riparian forest association (71.060.20). The CNDDDB (1999) considers this association to be a high priority for inventory (e.g., rare and worthy of consideration). In addition, portions of this association may be considered a wetland, in which case they would be considered sensitive by the USFWS, ACOE, CDFW, and local jurisdictions. Coast live oak is not considered a wetland species (USFWS 1996).

**Coast Live Oak Woodland (71160).** Coast live oak woodland typically occurs on steep, north-facing slopes and shaded ravines or along raised stream banks and terraces, where it forms open to relatively closed canopy stands dominated by coast live oak



(Holland 1986; Sawyer and Keeler-Wolf 1995). On Crestridge, this habitat occurs primarily on north and east-facing exposures and along drainages. Although coast live oak is the dominant tree species in this association, both Engelmann oak and scrub oak are subdominant species or occasional constituents of this habitat on slopes, while an occasional willow or sycamore occurs in woodlands along drainages. In the latter case, the riparian component is limited to only one or a few individuals and thus was not categorized as southern coast live oak riparian forest. In general, the shrub layer is poorly developed and consists of species from adjacent scrub or chaparral habitats. In one case, desert wild grape (*Vitis girdiana*) occurs within this habitat. San Diego sagewort is common at the edge of oak woodlands throughout the reserve. In those oak woodlands accessed directly, the herbaceous layer ranged from a moderate to sparse cover of herbaceous species or leaf litter. Oak woodlands on steep slopes often occur adjacent to large rock outcrops. The most well-developed stands of coast live oak woodland occur in the eastern portion of the reserve on north-facing slopes south of I-8 and throughout the site along the larger drainages. Coast live oak woodland accounts for 96.7 acres of vegetation on Crestridge. Of this total, 1.9 acres were classified as disturbed due to habitat degradation or fragmentation from off-road vehicle use or clearing for roads or fuel breaks.

Coast live oak woodland on Crestridge corresponds to the CNDDDB coast live oak woodland association (71.060.19). The CNDDDB (1999) does not consider this association to be a high priority for inventory. Oak woodlands are considered regionally sensitive, however, because of their limited acreage, high wildlife value, gradual loss to development, and lack of recruitment.

**Coast Live Oak Woodland - Open (71161).** Areas categorized as open coast live oak woodland are distinguished from closed-canopy woodlands by widely spaced trees within a matrix of other habitat types. Tree cover is generally less than about 50%, and Engelmann oak may assume a more co-dominant role than in the oak woodlands described above. The increased light allows for the development of shrub and herbaceous layers, with species from adjacent scrub or chaparral habitats. Common shrub components of open oak woodland onsite include laurel sumac, holly-leaf redberry, poison-oak, climbing bush penstemon (*Keckiella cordifolia*), California sagebrush, white sage, and California buckwheat. Open coast live oak woodland was mapped just east of the oak woodland near Horsemill Road, where it occurs with an understory of grassland and coastal sage scrub species. It also occurs on north-facing slopes south of I-8 and east of Flinn Springs County Park, where it includes scattered coast live oak trees. Open coast live oak woodland accounts for 28.4 acres of vegetation onsite. Of this total, 1.5 acres are considered disturbed.

Open coast live oak woodland on Crestridge corresponds, in part, to the CNDDDB coast live oak woodland association (71.060.19) and, possibly, open Engelmann oak



woodland (71.070.01). The CNDDDB (1999) considers the latter association to be a high priority for inventory. Open oak woodlands are also considered regionally sensitive.

## **Disturbed and Developed Areas**

**Disturbed (11300).** This category includes areas that have been physically disturbed or invaded by nonnative species, such that few or no native plant species remain. Although a disturbed modifier can be applied to any native habitat, the actual designation of Disturbed Area refers to areas that are no longer recognizable as a native or naturalized vegetation association. Disturbed areas are often associated with human-related activities such as clearing or grazing. On Crestridge, disturbed areas are mapped in and near the oak grove at the end of Horsemill Road, in the fuel break on the lower, west-facing slopes above Rios Canyon, in and near the previous racetrack area, and on a west-facing slope southeast of Flinn Springs County Park. The latter site was inaccessible (viewed by binocular from several vantage points), but appears to support a large stand (ca. 2.5 acres) of African fountaingrass. Disturbed areas along the fuel break appear to be functioning as a conduit for weed invasions into the reserve. Disturbed areas near the racetrack are directly related to off-road vehicle activities. Disturbed areas are not included in the CNDDDB's natural communities classification (CNDDDB 1999).

**Developed (12000).** Developed areas include areas that have been graded or otherwise physically altered such that conditions no longer exist to support native vegetation. On the Crestridge site, the water tank in the west-central portion of the site and a graded pad in the northwest corner of the site are in this category. The edge of the property boundary has been graded in association with residences or orchards. There are old structures and foundations remaining in the oak grove, as well as agricultural outbuildings. Developed areas are not included in the CNDDDB's natural communities classification (CNDDDB 1999).