DRAFT
VEGETATION COMMUNITIES OF SAN DIEGO COUNTY

Based on "Preliminary Descriptions of the Terrestrial Natural Communities of California" prepared by Robert F. Holland, Ph.D. for State of California, The Resources Agency, Department of Fish and Game (October 1986)

Codes revised by Thomas Oberbauer (February 1996)
Revised and expanded by Meghan Kelly (August 2006)
Further revised and reorganized by Jeremy Buegge (March 2008)

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Introduction

San Diego's vegetation communities owe their diversity to the wide range of soil and climatic conditions found in the County. The County encompasses desert, mountainous and coastal conditions over a wide range of elevation, precipitation and temperature changes. These conditions provide niches for endemic species and a wide range of vegetation communities. San Diego County is home to over 200 plant and animal species that are federally listed as rare, endangered, or threatened. The preservation of this diversity of species and habitats is important for the health of ecosystem functions, and their economic and intrinsic values.

In order to effectively classify the wide variety of vegetation communities found here, the framework developed by Robert Holland in 1986 has been added to and customized for San Diego County. To supplement the original Holland Code, additions were made by Thomas Oberbauer in 1996 to account for unique habitats found in San Diego and to account for artificial habitat features (i.e., 10,000 series). Prior to this draft, the additions made by Oberbauer were not explicitly defined. The purpose of this draft is to provide written descriptions with characteristic species and distributions within San Diego County for consistent application of classifications. Vegetation communities not present in San Diego County were omitted. Nomenclature and numbering here follows Holland's with a few minor exceptions.

While this revision is an important planning and regulatory tool, it is recognized that there are inherent limitations to vegetation classification. Nature does not follow a hierarchal and discrete system of species assemblages, but rather exhibits gradations and temporal fluctuations. Despite these limitations, this code sets guidelines that provide an efficient framework for environmental analysis, conservation planning, and natural resource management.

Summary of significant changes to Oberbauer's 1996 classification system:

Nine new classes were added:

- **23200** Relictual Interior Dunes
- **32530** Diegan Coastal Sage Scrub: Baccharis-dominated
- **42130** Saltgrass Grassland
- **42210** Non-Native Grassland: Broadleaf-Dominated
- **42211** Non-Native Grassland: Artichoke-Thistle-Dominated
- **52510** Herbaceous Wetland
- **62500** Southern Riparian Woodland
- **65000** Non-Native Riparian
- **65100** Arundo-Dominated Riparian

Two classes were deleted:

- **33300** Colorado Desert Wash Scrub
- **71210** California Walnut Woodland

The following classes were modified:

- **11100** Eucalyptus Woodland was moved to **79100**
- **13000-series** Unvegetated Habitat was moved to **64000-series**
- **29000** Acacia Scrub was moved to **33700**
- **37K00** Flat-topped Buckwheat was split into two groups: **32800** Flat-topped Buckwheat and **37K00** Montane Buckwhat Scrub
- **46100** Badlands/Mudhills was moved to **25000**
- **79000** "Undifferentiated Dense Woodland" was changed to "Non-Native Woodland"

Descriptions of Vegetation Communities of San Diego County

Symbols:

- ***** Denotes additions to Holland's original categories by Oberbauer (1996)
- **#** Denotes additions to Holland's original categories in this publication.
- **[ ]** Brackets are placed around species not native to California.

10000 Disturbed or Developed Habitat *

11000 Disturbed Habitat

Description: Characterized by predominantly non-native species introduced and established through human action. These areas are not typically artificially irrigated, but receive water from precipitation or runoff.
Distribution: Throughout San Diego County especially in highly populated areas, coastal and riparian zones.

11200 Disturbed Wetland

Description: Areas permanently or periodically inundated by water, which have been significantly modified by human activity.
Site Factors: This includes portions of wetlands with obvious artificial structures such as concrete lining, barricades, rip-rap, piers, or gates. Often unvegetated, but may contain scattered native or non-native vegetation. Examples include lined channels, Arizona crossings, detention basins, culverts, and ditches.
Characteristic Species: [*Arundo donax*], [*Tamarix* spp.], [*Eucalyptus* spp.], [*Phoenix* spp.], [*Washingtonia* spp.], [*Cortaderia* spp.], [*Cynodon dactylon*], but may also contain *Salix* spp., *Typha* spp., and a variety of other wetland plants.
Distribution: Throughout San Diego County.

11300 Disturbed Habitat

Description: Areas that have been physically disturbed (by previous legal human activity) and are no longer recognizable as a native or naturalized vegetation association, but continues to retain a soil substrate. Typically vegetation, if present, is nearly exclusively composed of non-native plant species such as ornamentals or ruderal exotic species that take advantage of disturbance, or shows signs of past or present animal usage that removes any capability of providing viable natural habitat for uses other than dispersal. Examples of disturbed land include areas that have been graded, repeatedly cleared for fuel management purposes and/or experienced repeated use that prevents natural revegetation (i.e., dirt parking lots, trails that have been present for several decades), recently graded firebreaks, graded construction pads, construction staging areas, off-road vehicle trails, and old homesites.
Characteristic Species: Invasive, non-native forb species, such as, thistles ([*Centaurea*], [*Carduus*], and [*Cynara*] spp.), [*Sonchus* spp.], [*Salsola*

tragus], *Heterotheca grandiflora*, [*Marrubium vulgare*], [*Sisymbrium irio*], [*Raphanus* spp.], [*Carpobrotus edulis*], [*Chrysanthemum* spp.], and [*Foeniculum vulgare*]. A limited number of grass species: [Pampas grass (*Cortaderia* spp.)] and [fountain grass (*Pennisetum* spp.)]; most annual grass species are more typical of Non-Native Grassland (42200) and do not dominate vegetative cover in Disturbed Habitat.

Distribution: Throughout San Diego County, especially in highly populated areas and regions with increased off-road vehicle activities.

12000 Urban/Developed

Description: Areas that have been constructed upon or otherwise physically altered to an extent that native vegetation is no longer supported. Developed land is characterized by permanent or semi-permanent structures, pavement or hardscape, and landscaped areas that often require irrigation. Areas where no natural land is evident due to a large amount of debris or other materials being placed upon it may also be considered Urban/Developed (e.g., car recycling plant, quarry).

Characteristic Species: Unvegetated or landscaped with a variety of ornamental (usually non-native) plants.

Distribution: Throughout San Diego County.

18000 Agriculture

Lands that support an active agricultural operation may be classified as Agriculture.

18100 Orchards/Vineyards

Description: Orchards are usually comprised of artificially irrigated habitat dominated by one (or sometimes several) tree or shrub species. The trees are typically low and bushy with an open understory. Vineyards include single species crops planted in rows that are usually supported by wood and wire trellises. Understory growth of both orchard and vineyard crops often include short grasses and other herbaceous plants between rows.

Distribution: Orchards and vineyards can be found on flat alluvial soils in the valley floors, in rolling foothill areas, or on relatively steep slopes.

18200 Intensive Agriculture

Description: Includes dairies, nurseries, and chicken ranches. Open spaces used for livestock. There is usually no vegetation present except between animal holding areas.

18300 Extensive Agriculture

18310 Field/Pasture

Description: This forms a dense habitat with nearly 100 percent cover. Planted fields are usually monoculture crops that are irrigated and usually artificially seeded and maintained.

Characteristic Species: Grass species from [*Avena*], [*Cynodon*], [*Hordeum*], [*Sorghum*], as well as [*Medicago* spp.].

18320 Row Crops

Description: Comprised of annual and perennial crops grown in rows with open space between the rows. Species composition frequently changes by season and year. Row crops often occur in floodplains or upland areas with high soil quality. Row crops are nearly always artificially irrigated.

20000 Dune Community

21000 Coastal Dunes

21100 Active Coastal Dunes

Description: Barren, mobile sand accumulations whose size and shape are determined by abiotic site factors rather than by stabilizing vegetation.

Site Factors: Dune size and shape varies with wind direction and speed, site topography, sand source, and grain size. Active Coastal Dunes often overrun adjacent Foredune (21200).

Characteristic Species: Unvegetated.

Distribution: Along the Pacific Coast where sandy beaches are present and coastal headlands are absent: Crescent City, Ft. Bragg, Pt. Arena, Bodega Bay, Dillon Beach, Pt. Reyes, San Francisco, Monterey, Morro Bay, Nipono Dunes, Los Angeles, and San Diego.

Sources: 1, 4, 8, 71, 84, 35, 86, 93

21200 Foredunes

21230 Southern Foredunes

Description: Dominated by succulent, perennial herbs and subshrubs; lacks perennial grasses, but has a higher proportion of suffrutescent plants (to 30 cm tall). Coverage varies from nearly complete to scattered. The species typically are zoned as in the Northern Foredunes, with *Abronia maritima*, *Ambrosia*, and *Cakile* usually occurring in the exposed sites and *Abronia umbellata*, *Calystegia*, and *Camissonia* in less exposed sites. Growth and flowering occur in early to mid spring.

Site Factors: Usually foredunes, but integrades with upper beaches. Similar to Active Coastal Dunes (21100), but with less wind and/or a smaller supply of sand and/or more available groundwater but drier, a little warmer and less strong or persistent onshore wind.

Characteristic Species: *Abronia maritima, Abronia umbellata, Ambrosia chamissonis bipinnatisecta, Atriplex leucophylla, [Cakile maritima], Calystegia soldanella, Camissonia cheiranthifolia suffruticosa, Distichlis spicata, Haplopappus venetus, [Carpobrotus edulis].*

Distribution: Areas of sand accumulation along the coast between Point Conception and the Mexican border. No areas remain which are as

extensive as those found north of Point Conception. Small areas occur near Pt. Conception and Coal Oil Pt./ Santa Barbara County; Pt. Mugu, Ventura County; El Segundo, Los Angeles County; and Coronado, San Diego County. Now much reduced by urban and other development.

Sources: 1, 4, 8, 89, 93

22000 Desert Dunes

22100 Active Desert Dunes

Description: Essentially barren expanses of actively-moving sand whose size and shape are determined by abiotic site factors rather than by stabilizing vegetation.

Site Factors: Surface temperatures become extremely high during the summer.

Characteristic Species: *Cleome sparsifolia, Dicoria canescens, Oenothera avita, Tiquilia alicata.*

Distribution: Areas of sand accumulation in the desert. Well developed in Eureka Valley and Death Valley, Inyo County; near Kelso, San Bernardino County; Thousand Palms, Riverside County; between El Centro and Yuma, Imperial County, and to a lesser extent in Borrego Valley, San Diego County.

Sources: 1, 6

22300 Stabilized and Partially- Stabilized Desert Sand Fields

Description: Desert sand accumulations that are not obviously worked into Dune landforms. Vegetation varies from scant cover of widely scattered shrubs and herbs to nearly closed shrub canopies.

Site Factors: Reduced sand dune microrelief. Often found along the toe of bajada slopes.

Characteristic Species: *Abronia villosa, Ambrosia dumosa, Astragalus* spp., *Atriplex canescens, Croton califomicus mojavensis, Dalea* spp., *Dicoria canescens, Eriophullum pringlei, E. wallacei, Geraea canescens, Hesperocallis undulata, Larrea tridentata, Mentzelia longiloba, Oenothera deltoides, Oryzopsis hymenoides, Palafoxia linearis, Petalonyx thurberi, Prosopis juliflora, Prosopis glandulifera, Psorothamnus* spp., *Runex hymenosepalus Tiquilia plicata.*

Distribution: Flat sand accumulations throughout the Desert Region, generally below about 5,000 feet. In San Diego County: East of Borrego Springs grading into Mesquite Bosque south of Borrego Airport, Ocotillo Wells

Sources: 1, 6, 48, 308

23000 Interior Dunes

23200 Relictual Interior Dunes

Description: A low, very open Atriplex polycarpa-dominated shrubland with a well-developed understory of psamnophyllic herbs.

Site Factors: Loose, sandy soils derived from old beaches that surrounded the large Valley Minnow Lakes (A1111) in the pre-agricultural Central Valley.
Characteristic Species: *Amsinckia intendedia, Atriplex polycarpa, Astragalus homii, Bronus rubens, Disticnlis spicata, Heterotheca grandiflora, Lasthenia californica, Layia pentachaeta albida, Oenothera deltoides cognata.* In San Diego County: saltbush (*Atriplex* spp.) and other halophytes.
Distribution: Old beach deposits surrounding Tulare, Buena Vista, and Goose lakes, now mostly converted to agriculture. In San Diego County: east of Clark Dry Lake in Borrego Valley.
Sources: 308

24000 Stabilized Alkaline Dunes*
Description: Desert sand accumulations that are worked into Dune landforms. Vegetation is normally composed of widely scattered shrubs and herbs.
Site Factors: Reduced sand dune microrelief. Often found along the toe of bajada slopes.
Characteristic Species: *Ambrosia* spp*., Atriplex* spp.
Distribution: In San Diego County; Anza Borrego desert region in the east valley by the Borrego Sink.
Source: 306

25000 Badlands/Mudhills * (#moved from 46100)
Description: Vegetative cover very low.
Characteristic Species: *Erigonum inflatum, Astragalus* spp., *Atriplex hymelytra, Xylorhiza orcuttii*
Distribution: In San Diego County: Borrego Badlands, Carrizo Badlands
Source: 306

30000 Scrub and Chaparral Community

31000 Coastal Bluff Scrub

31200 Southern Coastal Bluff Scrub
Description: A low scrub up to 2m tall, forming continuous mats or more scattered. Dwarf shrubs, herbaceous perennials, and annuals are represented; varying degrees of succulence are shown. Most plants woody and/or succulent. Most growth and flowering occur from late winter through spring.
Site Factors: Exposed to varying, moisture-laden winds with high salt content. Soil usually rocky and poorly developed.
Characteristic Species: *Atripiex* spp., *Calystegia cyclostegia*, *C. macrostegia, Castilleja affinis, Chorizanthe orcuttiana, Coreopsis gigantea, C. maritima, Dudleya* spp., *Encelia californica, Erigeron glaucus,*

Eriophyllum staechadifolium, Haploppappus spp., *Malacothrix saxatilis, Marah macrocarpus* [*Carpobrotus aequilateralus*] [*Mesembryanthemum crystallinum*], *Opuntia littoralis, Rhus integrifolia.*

Distribution: At localized sites along the coast, south of Pt. Conception; Pt. Mugu, Pt. Dune, Pt. Vicente, Dana Pt. In San Diego County: Torrey Pines State Reserve, Pt. Loma, etc. several sites on the off-shore islands.

Sources: 1, 8, 89

32000 Coastal Scrub

32400 Maritime Succulent Scrub

Description: A low (knee to waist high), open (25-75% cover) scrub dominated by drought deciduous, subligneous, malacophyllous shrubs with a rich admixture of stem and leaf succulents. The proportion of cacti is highest toward the south or in some inland areas. The ground is more or less bare between the shrubs. Growth and flowering are concentrated in the spring.

Site Factors: On thin rocky or sandy soils, often on steep slopes of coastal headlands and bluffs.

Characteristic Species: *Acalypha californica. Agave shawii, Artemisia californica, Bergerocactus emoryi, Encelia californica, Euphorbia misera, Ferocactus viridescens, Lycium californicum, Opuntia littoralis, O. oricola, O. prolifera, Rhus integrifolia, Viguera laciniata.*

Distribution: Restricted to within a few miles of the coast from about Torrey Pines south to El Rosario, Baja California Norte, and on San Clemente and Catalina islands.In San Diego County it extends as far inland as Bonita where site factors are present.

Sources: 1, 8, 58-61, 89, 103, 107, 108, 112, 115, 120, 142

32500 Diegan Coastal Sage Scrub

Description: Low, soft-woody subshrubs (to ca. 1 m high) that are most active in winter and early spring. Many taxa are facultatively drought- deciduous. Dominated by *Artemisia californica* and *Eriogonum fasciculatum* together with *Malosma laurina, Salvia apiana* and *Salvia mellifera*. Stem- and leaf-succulents, while present, are not nearly as conspicuous as in Maritime Succulent Scrub (32400).

Site Factors: Typically on low moisture-availability sites: steep, xeric slopes or clay-rich soils that are slow to release stored water. Intergrades at higher elevations with several chaparrals (37000).

Characteristic Species: *Artemisia californica, Eriogonum fasciculatum, Galvesia speciosa, Haplopappus venetus, Lavatera assurgentiflora, Lotus scoparius, Malacothamnus fasciculatus, Malosma laurina, Rhus integrifolia, Salvia apiana, Salvia mellifera, Stipa lepida*.

Distribution: This is the wide-spread coastal sage scrub in coastal southern California from Los Angeles into Baja California.

Sources: 6, 58-61, 103, 108, 142

32510 Diegan Coastal Sage Scrub: Coastal Form*

Description: Similar to Diegan Coastal Sage Scrub (32500) but at lower elevations, below 1000 feet.

Characteristic Species: *Artemesia californica* is more dominant in coastal forms; other associated dominants may include: *Eriogonum fasciculatum, Keckiella antirhinoides, Malosma laurina, Rhus integrifolia*, and *Salvia mellifera.*

Distribution: Variable east to west within San Diego County, but generally including Barrett Junction, El Capitan Reservoir, Clevenger Canyon, Rincon and Pala, and areas to the west.

Source: 306, 308

32520 Diegan Coastal Sage Scrub: Inland Form*

Description: Similar to Diegan Coastal Sage Scrub (32500) but at higher elevations, above 1000 feet.

Characteristic Species: Singularly dominated by white sage (*Salvia apiana*). Can also include *Keckiella antirhinoides, Yucca whipplei, Hazardia squarrosa,* and *Achnatherum coronata*. Sometimes containing widely scattered *Quercus engelmanii.*

Distribution: In San Diego County: East of Coastal Sage Scrub localities listed above for coastal form. Yields to other drier upper Sonoran Sub-shrub Scrub (39000) and Sonoran Desert Scrub (33000) communities at the desert edge east of: Chihuahua Valley, Lake Henshaw Valley, Volcan Mountain, Banner Canyon, La Posta Creek, and Jewel Valley.

Source: 306, 308

32530 Diegan Coastal Sage Scrub: Baccharis-dominated #

Description: Similar to Diegan Coastal Sage Scrub (32500) but dominated by *Baccharis* species.

Site Factors: Typically on disturbed sites or those with nutrient-poor soils. Often found within other forms of Diegan Coastal Sage Scrub (32500) and on upper terraces of river valleys. If associated with an arroyo, it may be best classified as Southern Riparian Scrub (63300).

Characteristic Species: Dominated by *Baccharis sarothroides* and/or *Baccharis pilularis*. May also include *Artemesia californica, Eriogonum fasciculatum, Hazardia squarrosa, Isocoma menziesii,* and *Salvia mellifera* in lesser amounts.

Distribution: Coastal and foothill areas in San Diego County.

32700 Riversidian Sage Scrub

Description: This is the most xeric expression of Coastal Sage Scrub south of Point Conception. Typical stands are fairly open and dominated by *Artemisia californica, Eriogonum fasciculatum*, and [*Bromus madrietensis*

ssp. *rubens*], each attaining at least 20% cover. Differs from Encilia scrub (33600) in lacking other true desert species.

Site Factors: Typically on xeric sites such as steep slopes, severely drained soils, or clays that release stored soil moisture only slowly. Intergrades at slightly higher elevations with several southern Californian chaparrals (37000).

Characteristic Species: *Artemisia californica, Atriplex canescens*, [*Bromus rubens*] , *Encelia fairinosa, Ericameria pinefolia, Eriodictyon crassifoliun, Eriogonum fasciculatum, Gutierrezia californica, Ericameria linearifolia, Isaneris arboreus, Lotus scoparius, Malacothamnus fasciculatus, Salvia apiana, S. mellifera, Yucca whipplei parishii.*

Distribution: Along the coastal base of the Transverse and Peninsular ranges from central Los Angeles County to the Mexican frontier. Very limited distribution in San Diego County. Occurs in Temecula and further inland.

Sources: 58-61, 98, 99, 102, 103, 114, 137, 142, 308

32710 Riversidian Upland Sage Scrub *

Description: Similar to Riversidian Sage Scrub (32700).

Distribution: In San Diego County: South slopes along Banner Grade may fit this category.

32720 Alluvial Fan Scrub *

Description: Similar to Riversidian Sage Scrub (32700) with some riparian species.

Characteristic Species: *Lepidospartum squamatum, Eriogonum fasciculatum, Salvia apiana,* as well as more riparian species such as *Platanus racemosa* and *Baccharis salicifolia*. *Hemizonia floribunda* dominates some areas which resemble this community, though its range is limited.

Distribution: In San Diego County: San Luis Rey River in Pauma Valley, upper Temecula Creek, San Mateo Creek, some minor drainages near La Posta, Tecate, and Jacumba.

Sources: 306, 308.

32800 Flat-topped Buckwheat * (*moved from 37K00***)**

Description: A nearly monoculture community usually resulting from disturbance and transitioning to coastal sage scrub or chaparral. Species characteristic of these communities appear over time. At higher elevations this is often Montane Buckwheat Scrub (37K00#).

Site Factors: Often in disturbed areas in the coastal and foothill areas of San Diego County. Often intergrades with Diegan coastal sage scrub (32500).

Characteristic Species: *Eriogonum fasciculatum, Lotus scoparius*.

Distribution: Coastal areas and foothills throughout San Diego County.

Source: 306

33000 Sonoran Desert Scrub

33100 Sonoran Creosote Bush Scrub

Description: Shrubs, 0.5-3 m tall, widely spaced, usually with bare ground between. Great species and life form diversity including several succulents. Growth occurs from winter to early spring (or rarely at other seasons) if rainfall is sufficient. Shrubs may be dormant for long periods. Many species of ephemeral herbs may flower in late February and March if the winter rains are sufficient. This is the basic creosote scrub of the Colorado Desert.

Site Factors: Well-drained secondary soils of slopes, fans and valleys rather than upland sites with thin residual soils or sites with high soil salinity. Winter temperatures seldom below freezing. Does not support an extensive diversity of other woody or succulent plants. In sandy areas, annual wildflowers may occur extensively (see 42300).

Characteristic Species: Predominantly *Larrea tridentata.* Also *Ambrosia dumosa, Encelia farinosa, Fouquieria splendens*.

Distribution: Colorado Desert Region from the Little San Bernardino Mountains, south and eastward into Baja California, southern Arizona and Sonora. The dominant plant community below 2,500 or 3,000 feet (760 or 910m). Intergrades broadly with Mojave Creosote Bush Scrub (34100) in southeastern San Bernardino County and eastern Riverside County. In San Diego County: Does not occur extensively as the dominant vegetation community except in North Borrego Springs and near Ocotillo Wells, Vallecito Valley, and Mason Valley.

Sources: 1, 8, 48, 62, 122, 123, 308

33200 Sonoran Desert Mixed Scrub

33210 Sonoran Mixed Woody Scrub

Description: Similar to Sonoran Mixed Woody and Succulent Scrub (33220) but with a mixture of three or more woody species.

Characteristic Species: *Larrea tridentata, Ambrosia dumosa, Fouquieria splendens, Opuntia* spp., *Encelia farinosa, Krameria spinosa*

Distribution: In San Diego County: much of the area surrounding Borrego Springs, on lower alluvial fans, above the desert floor and below the coarse mountain substrates.

33220 Sonoran Mixed Woody and Succulent Scrub

Description: This, the only Colorado Desert community with substantial dominance of cacti and other stem succulents, is dominated by shrubs, 0.5-3 m tall, similar in aspect to Sonoran Creosote Bush Scrub (33100) but more varied and usually denser. Includes species from Sonoran Creosote Bush Scrub (33100) with no clear dominant. Most stands have *Agave deserti, Encelia farinosa,*

Fouquieria splendens, Peucephyllum schottii, and *Yucca schidigera* in varying proportions. This type could be subdivided into more comprehensible units. In San Diego County, vegetation is dominated by over 50% cover of succulent species (*Ferocactus cylindraceus*, *Cylindropuntia* spp., *Fouqueria splendens*, *Simmondsia chinensis*, *Yucca schidiggera*, and *Agave desertii*).

Site Factors: Rocky, well-drained slopes and alluvial fans, usually at the base of mountains. Similar to Sonoran Creosote Bush Scrub (33100), but terrain usually more varied and moisture supply often greater.

Characteristic Species: *Acacia greggii, Agave deserti, Dalea* spp.*, Echinocactus acanthodes, Echinocereus engelmannii*, *Encelia farinosa, Ferocactus acanthiodes, Fouquieria splendens, Haplopappus* spp.*, Larrea tridentata, Opuntia* spp., *Simmondsia chinensis*

Distribution: Southern and eastern Mojave Desert and the Colorado Desert, usually between 1,000 and 4,000 feet (300 and 1210 m). General distribution similar to Sonoran Creosote Bush Scrub (33100), but more localized. In San Diego County: more highly drained alluvial fans and washes such as San Felipe Wash at Highway 78, "Cactus Gardens" (sout of Borrego Mountain), south facing slopes of Vallecito Mountain.

Sources: 1, 8, 48, 62, 123, 308

33230 Sonoran Wash Scrub*

Description: Desert washes with shrubby vegetation.

Site Factors: Located in dryer parts of desert streams, braided tributaries of Dry Desert Wash Woodland (62200) where subsurface water won't support woodland species. Transitions into Acacia Scrub (32900), Mesquite Bosque (61820), or Desert Dry Wash Woodland (62200).

Characteristic Species: *Hymenoclea monogyra, Hyptis emoryi, Justicia californica.* To a lesser extent *Acacia greggii, Chilopsis linearis, Psorothamnus, Olneya tesota, Prosopis glandulifera.*

Distribution: In San Diego County: tributaries of Coyote Creek, San Felipe Creek and Carrizo Creek.

Source: 306, 308

33500 Calcicolous Scrub*

Description: Low-statured, sparse scrub community with little vegetation; some annuals.

Site Factors: Mudhills with high salt and gypsum content.

Characteristic Species: *Encelia farinosa* occurring with *Argemona munita* ssp. *robusta, Atriplex* spp., *Ambrosia* spp.*, Erigonum* spp. (annuals including *E. inflatum*)*,Gilia latifolia, Peuciphyllum schottii*

Distribution: In San Diego County, highly localized Upper Fish Creek near the Gypsum Mine, Vallecitos Mountains, Font's Point
Source: 48, 306, 308

33600 Encelia Scrub*

Description: Low desert scrub community dominated by brittlebush (*Encelia farinosa*).

Site Factors: Occurs on desert slopes (including talus slopes) and alluvial fans. Composed of ≥ 50% *Encelia farinosa* cover with some other true desert species.

Characteristic Species: *Encelia farinosa, Fouquieria splendens, Larrea tridentata.*

Distribution: In San Diego County: Occupying the lower steep east desert escarpment of Hot Springs, Granite, and Laguna Mountains and extending onto alluvial fans in Potrero. Coyote Creek northeast of Borrego Springs southward to the International border.

Source: 306, 308, 309

33700 Acacia Scrub*

Description: Shrub community dominated by cat claw (*Acacia greggii*).

Site Factors: Occurs on slopes and bajadas where it grades into Sonoran Wash Scurb (33300), mesquite stands, and several phases of chaparral.

Characteristic Species: Greater than 50% relative cover of *Acacia greggii*

Distribution: In San Diego County: upper San Diego River Valley (Cedar Falls and the mouth of Boulder Creek), San Felipe Valley, eastern Henshaw Valley, Vallecito Valley.

Source: 306, 308

34000 Mojavean Desert Scrub

34300 Blackbrush Scrub

Description: Low, often intricately branched shrubs, 0.5-1 m tall, with crowns usually not touching and with bare ground between plants. Most growth and flowering occurs in late spring. Dormant in winter (from cold) and probably in summer and fall (from drought). Dominated by blackbrush (*Coleogyne ramosissima*). In San Diego County *Coleogyne ramosissima* is a co-dominant species with either *Larrea tridentata* or *Juniperus californica*.

Site Factors: On dry, well-drained slopes and flats with shallow often calcareous soils of very low water holding capacity, often intergrading with Pinyon-Juniper Woodlands (72000), but typically at somewhat lower elevations, warmer, and drier. In San Diego County, this is a higher elevation desert community.

Characteristic Species: *Agave utahensis, Artemisia spinescens, Atriplex confertifolia, Chrysothamnus teretifolius, Coleogyne ramosissima, Ephedra nevadensis, Eriogonon fasciculatum polifolium, Eurotia lanata, Hilaria rigida, Grayia spinosa, Menodora spinescens, Salazaria mexicana, Salvia dorri, Sitanion longifolium, Spheralcea ambigua, Stipa speciosa, Thamnosma montana, Yucca baccata*

Distribution: In San Diego County: hills and plains around Earthquake Valley (aka Shelter Valley), Montezuma Grade, Mountain Springs. Typically between 4000 and 7000 feet.
Sources: 1, 48, 63, 91, 308

35000 Great Basin Scrub

Description: A moderately tall, fairly open shrubland with several species contributing to the canopy. Dominants usually include *Artemisia tridentata* and *Purshia tridentata* with several perennial grasses between the shrubs.
Site Factors: Deep, gravelly, well drained sites, usually on alluvium derived primarily from granitic sources.
Characteristic Species: *Artemisia tridentata, Oryzopsis hymenoides, Pinus monophylla, Prunus andersonii, Purshia tridentata, Sitanion hystrix, Stipa speciosa*
Distribution: Widely distributed in the northern Mojave and throughout the Great Basin deserts, as well as extensive on much of the Modoc Plateau. Also apparently in isolated pockets in the Inner South Coast Ranges.
Sources: 1, 48, 68, 91, 132

35200 Sagebrush Scrub

35210 Big Sagebrush Scrub

Description: Mostly soft-woody shrubs, 0.5-2 m tall, usually with bare ground underneath and between shrubs. *Artemisia tridentata* is dominant. Growth occurs mostly in late spring and early summer. Some species flower in late spring (*Coleogyne, Purshia*), others in early fall (*Artemisia, Chrysothamnus*). Dormant in winter.
Site Factors: Occurs on a wide variety of soils and terrain, from rocky, well-drained slopes to fine-textured valley soils with high water table. May be colder (from cold air drainage), drier, or with less well-drained more alkaline soil than Pinyon-Juniper Woodland (72000), a frequent associate. In San Diego County, this often occurs in alluvial washes along dry margins of high desert and montane valleys.
Characteristic Species: *Artemisia tridentate* with *Agropyron spicatum, Atripiex canescens, Bromus marginatus, Chrysothamnus nauseosus, Coleogyne ramosissima, Elymus cinereus, Festuca idahoensis, Hilaria jamesii, Oryzopsis hymenoides, Purshia tridentata, Stipa conata, S. lettermanii, S. occidentalis, S. thurberiana, S. speciosa*
Distribution: Scattered localities within and along the margins of the Mojave and Sonoran deserts (on desert mountain ranges) and in interior cismontane southern California. Usually occurs between 4,000 and 9,000 feet (1210 and 2730 m). Distributed extensively through the Intermountain West. In San Diego County: Pine Valley and Corte Madera to McCain Valley, Oak Grove, Chihuahua Valley to Ranchita.

Sources: 1, 48, 65, 68, 132, 308

36000 Chenopod Scrub

36110 Desert Saltbush Scrub

Description: Usually low, grayish, microphyllous shrubs, 0.3-1 m tall, with some succulent species. Total cover often low, with much bare ground between the widely spaced shrubs, stands typically are strongly dominated by a single *Atripiex* species (in San Diego County, mostly *Atriplex polycarpa* with other *Atriplex* spp. and *Isocoma acradenia* as sub-dominants).

Site Factors: Fine-textured, poorly drained soils with high alkalinity and/or salinity, usually surrounding playas on slightly higher ground, hence somewhat drier than the adjacent Desert Sink scrub (36120). In San Diego County, may be inter-mixed with Mesquite Bosque and Creosote Bush Scrub.

Characteristic Species: *Aster intricatvis, Atriplex argentea, Atriplex canescens, A. confertifolia, A. elegans* ssp. *fasciculata, A. hymenolytra, A. lentirormis, A. nuttallii, A. garryi, A. phyllostegia, A. polycarpa, A. pusilla, A. torreyi, Grayia spinosa, Hymenoclea salsola, Kochia californica, Lyciun andersonii, L. cooperi, Prosopis glandulosa* var. *torreyana, Suaeda occidentalis*

Distribution: Widely scattered on margins of dry lake beds in the Colorado, Mojave, and Great Basin deserts. In San Diego County: the area surrounding the Borrego Sink playa and possibly areas surrounding Clark Dry Lake.

Sources: 1, 8, 48, 130, 132, 133, 308

36120 Desert Sink Scrub

Description: Similar to Desert Saltbush Scrub (36110), but plants often more widely spaced and with most species succulent chenopods.

Site Factors: Poorly drained soils with extremely high alkalinity and/or salt content. Often with high water table and with salt crust at the surface.

Characteristic Species: *Allenrolfea occidentalis, Atriplex canescens, Cleome sparsiflora, Cressa truxillensis minima, Erysimum capitatum bealianum, Frankenia grandifolia campestris, Heliotropium curassavicum oculatun, Kochia californica, Lepidium dictyotum, Monolepis nuttalliana, Nitrophila occidentalis, Oxystylis lutea, Sarcobatus vermiculatus, Sesuvion verrucosum, Ruppia cirrhosa, Sueda torreyana, Wislizenia refracta*

Distribution: Moist valley bottoms and lakebeds scattered throughout the Sonoran Desert, Mojave Desert, Owens Valley, and nearby areas, usually below about 4000 feet. In San Diego County: valley floor

of Borrego Valley, adjacent to Borrego Sink and Clark Dry Lake; possibly also at Vallecito Stage Station.

Sources: 1, 8, 13, 48, 65, 308

37000 Chaparral

37100 Upper Sonoran Mixed Chaparral

37110 Nothern Mixed Chaparral (*see 37130*)

37120 Southern Mixed Chaparral

Description: Broad-leaved sclerophyll shrubs, 1.5-3 m tall. Occasionally with patches of bare soil or forming a mosaic with Venturan Coastal Sage Scrub (32300) or Riversidean Sage Scrub (32700). Divisible into Granitic (37121) and Mafic (37122) subtypes based on substrate, but floristic distinctions between these two subtypes remain unknown. In San Diego County, this is dominated by blue-colored lilacs, especially Ramona lilac (*Ceanothus tomentosus* var. *olivaceus*) as well as *C. leucodermis, C. oliganthus*; other Ceanothus spp. generally indicate other chaparral types.

Site Factors: Dry, rocky, often steep slopes with little soil and moderate temperatures. Slopes are typically south-facing in northern California but north-facing in the south. Often adjacent to and on moister sites than Chamise Chaparral (37200). Transitional from the chaparral habitats of California to the coastal semi-desert of Baja California Norte. In San Diego County, it generally occurs east of Southern Maritime Chaparral and west of Montane Chaparral.

Characteristic Species*: Adenostoma fasciculatum, Arctostaphylos glandulosa, A. pennisularis, Calochortus albus, Ceanothus tomentosus olivaceus, C. verrucosus, Cercocarpus minutiflorus, Cneoridium dumosum, Fritillaria biflora, Heteromeles arbutifolia, Lonicera subspicata, Quercus dumosa, Malosma laurina, Rhamnus crocea, Rhus ovata, Ribes indecorum, Xylcoccus bicolor, Yucca schidigera, Y. whipplei*

Distribution: Coastal foothills of San Diego County and northern Baja California, usually below 3,000 feet (910m). Occurs in Jamul, Dulzura, Lakeside, Ramona, Fallbrook, Valley Center, Rainbow, and Pala, with a few significant stands outside San Diego County.

Sources: 103, 141, 142, 308

37121 Granitic Southern Mixed Chaparral

Description: Similar to Southern Mixed Chaparral (37120) but with granitic soils.

Characteristic Species: Same as Southern Mixed Chaparral.

37122 Mafic Southern Mixed Chaparral

Description: Similar to Southern Mixed Chaparral (37120) on mafic or metavolcanic soils but dominated by chamise and Cleveland sage.

Site Factors: Found on mafic (gabbro), metavolcanic, or metasedimentary derived soils (Los Posas and Boomer Soils) in the coastal region. These soils can have a very red or dark brown appearance.

Characteristic Species: *Adenostoma fasticulatum, Salvia clevelandii*. Indicator plants that may be uncommon on site: *Tetracoccus dioicus, Nolina interrata, Nolina cismontana*, *Arctostaphylos peninsularis, Monaredella hypoleuca* var. *lanata*, *Calamagrostis koeleriodes.*

Distribution: In San Diego County: Guatay Mt., Otay Mt., Iron Mt., Las Posas Mts., Black Mt., Magee Ridge, Viejas Mt., Rattlesnake Mt., Mount Whitney, Barber Mt., Lawson Peak, Black Mt. (near Penasquitos east of Pamo Valley), McGinty Mtn, Red Top, and parts of several other named and unnamed peaks.

Source: 308

37130 Northern Mixed Chaparral*

Description: Broad-leaved sclerophyll shrubs, 2-4 m tall, forming dense, often nearly impenetrable vegetation dominated by *Quercus dumosa, Adenostoma fasciculatum*, and any one of several taxa in *Arctostaphylos* and *Ceanothus*. Plants typically deep-rooted, usually little or no understory vegetation; often considerable accumulation of leaf litter. Growth may occur throughout the year but is highest in spring and much reduced during the late summer-fall dry season or during the winter at higher elevations. Flowering season extends from late winter to early summer. Adapted to repeated fires, to which many species respond by stump sprouting. A dense cover of annual herbs may appear during the first growing season after a fire, followed in subsequent years by perennial herbs, short-lived shrubs and re-establishment of dominance by the original shrub species. In San Diego County, inland of Southern Mixed Chaparral, indicated by *Ceanothus greggii* and other co-dominants (*Adenostoma fasciculatum*, *Quercus berberidifolia*, and other oak hybrids).

Site Factors: Dry, rocky, often steep slopes with little soil. Slopes are typically south-facing in northern California but north-facing in the south. Often adjacent to, but on rockier soils than Oak Woodland (71100) or Valley and Foothill Grassland (42000), rockier but moister than Venturan Coastal Sage Scrub (32300) or Riversidian Sage scrub (32700); and warmer, rockier and drier than

Broadleaved Evergreen Forest (81000) or Lower Montane Coniferous Forest (84100).

Characteristic Species: *Adenostoma fasciculatum, Aesculus californica, Arctostaphylos glandulosa, A. glauca, A. viscida, Ceanothus cuneatus, C. greggii, C. leucodermis, C. volutinus, Cercis occidentalis, Cercocarpus betuloides, Ericdictyon caifornicum, Fraxinus dipetala, Fremontia californica, Heteromeles arbutifolia, Lonicera involucrata, Malacothamnus fremontii, Pickeringia montana, Prunus ilicifolia, Quercus chrysolepis, Q. dumosa, Q. wislizenii, Rhus ovata, R. trilobata* var. *malacophylla, Toxicodendron diversilobum*

Distribution: Transverse and Peninsular Ranges of southern California on slopes away from the deserts. Generally becoming more abundant from north to south, usually below 5,000 feet (1520m) in southern California. In San Diego County: east of Descanso, Ramona, and Valley Center.

Sources: 1, 8, 106, 142, 148, 155, 308

37131 Granitic Northern Mixed Chaparral*

Description: Similar to Northern Mixed Chaparral (37130) but with granitic soils.

Characteristic Species: *Adenostoma fasticulatum, Ceanothus leucodermis, C. greggii, Quercus berberidifolia, Cercocarpus betuloides*

Distribution: In San Diego County: Widespread upslope of the Southern Mixed Chaparrals and west of the Montane and Semi-Dsert Chaparral (37400).

37132 Mafic Northern Mixed Chaparral*

Description: Similar to Northern Mixed Chaparral (37130) but with mafic soils. In San Diego County, in gabbro and metavolcanic soils such as Friant and San Miguel; may also include some Julian schist and other metamorphics.

Characteristic Species: Universally dominant is *Andenostoma fasticulatum* with varying densities of codominants *Nolina* spp., *Cupressus* spp., *Salvia sonomensis, Salvia clevelandii, Diplacus clevelandii, Ceanothus otayensis, Quercus X moreha, Chamaebatia australis, Tetracoccus dioicus*

Distrubution: In San Diego County: Cuyamaca Peak, Tecate Mountain, Inspiration Point, west of Corte Madera Peak, and Tule Mountain.

Source: 306, 308

37200 Chamise Chaparral

Description: A 1-3 m tall chaparral overwhelmingly dominated by chamise. Associated species contribute little to cover. Adapted to repeated fires by stump sprouting. Mature stands are densely interwoven with very little herbaceous understory or litter.

Site Factors: Similar to Upper Sonoran Mixed Chaparrals (37100), but on shallower, drier soils or at sonewhat lower elevations. Often on xeric slopes and ridges, with adjacent more mesic sites mantled by Upper Sonoran Mixed Chaparrals.

Characteristic Species: *Adenostoma fasciculatum, Arctostaphylos glauca, A. tomentosa, A. viscida, Ceanothus cuneatus, C. papillosus, Cercocarpus betuloides, Dendromecon rigida, Eriogonum fasciculatum, Eriodictyon califomicum, Lotus scoparius, Prunus ilicifolia, Quercus dumosa, Rhus ovata, Malosma laurina, Salvia apiana, S. mellifera, Selaginella cinerascens, Yucca schidigera, Y. whipplei*

Distribution: General distribution similar to Northern Mixed Chaparral (37110) but relatively infrequent in the north compared to its abundance in the south. The predominant chaparral type in Ventura, Los Angeles, San Bernardino, Riverside, and San Diego counties.

Sources: 1, 8, 67, 68, 101, 128, 137, 141, 142, 148, 155, 157

37210 Granitic Chamise Chaparral*

Description: Chamise Chaparral (37200) found on granitic soil.

37220 Mafic Chamise Chaparral*

Description: Chamise Chaparral (37200) found on gabbro and metavolcanic soils (typically very red with high concentrations of iron and/or selenium).

37300 Red Shank Chaparral

Description: Very similar to Chamise Chaparral (37200), but typically taller (2 to 4 m) and somewhat more open. Often forming nearly pure stands (at least 50% cover) of *Adenostoma sparsifolium* which flowers in mid-summer, in contrast to the spring flowering of *A. fasciculatum*. Probably dormant in winter, at least at its higher elevations. In San Diego County, sub-dominants include *Ceanothus greggii, Opuntia* spp., *Adenostoma fasciculata, Quercus* spp.

Site Factors: Similar to Chamise Chaparral (37200), but usually confined to granitic soils; often at higher elevation with greater precipitation and colder winters. Often adjacent to and intergrading with Chamise Chaparral; on rockier soils than Peninsular pinyon-Juniper Woodland (72300); and at lower elevations or on rockier

sites than Lower Montane Coniferous Forest (84100). In San Diego County, found below montane chaparrals (below ~4000 ft.).

Characteristic Species: *Adenostona fasciculatum, A. sparsifolium*, *Arctostaphylos* spp., *Ceanothus* spp*., Quercus dumosa, Rhus ovata*

Distribution: Can be found near Campo and Chihuahua Valley Common from San Gorgonio Pass southward into northern Baja California, most commonly on interior cismontane slopes between 300 feet and 6,000 feet. Abundant on the slopes of the San Jacinto and Santa Rosa Mountains. In San Diego County: Laguna Summit to Bankhead Springs, Aguanga to Warner Springs, lower slopes of Hot Springs Mountain, McCain Valley.

Sources: 67, 148, 308

37400 Semi-Desert Chaparral

Description: Very similar to Northern Mixed Chaparral (37110), but more open and not quite so tall (1.5-3 m). Several of the dominant taxa (*Juniperus*, *Eriogonurn*, *Opuntia*, etc.) are not broad-leaved sclerophylls. Probably dormant in winter (from cold) and in late summer and fall (from drought).

Site Factors: Similar to Northern Mixed Chaparral (37110), but drier and with colder winters. Very similar to Red Shank Chaparral (37300), but probably a bit drier and hotter in summer. Often intergrading with Mojavean Pinyon-juniper Woodlands (72200), but on rockier soils or recently burned sites. Less fire-prone than other chaparrals due to lower fuel loads. In San Diego County, found on the high desert plateaus and escarpment of the Peninsular Range.

Characteristic Species: *Adenostoma fasciculatum, Arctostaphylos glauca, A. parryana, A. pungens, Ceanothus cuneatus, C. greggii, C. vestitus, Cercocarpus betuloides, Cowania mexicana stansburiana, Dendromecon rigida, Ephedra* spp*., Ericameria brachylepsis, Eriodictyon trichocalyx, Eriogonum fasciculatum, Fallugia paradoxa, Fremontodendron californicum, Garrya flavescens pallida, Juniperus californica, Opuntia acanthocarpa., Prunus fasciculatum, P. fremontii, Purshia tridentata, Quercus dunnii, Q. turbinella, Q. Cornelius-mulleri (*and other scrub oaks of the desert transition*), Rhus ovata, R. trilobata, Yucca whipplei, Ziziphus parryi.*

Distribution: Interior slopes of the Transverse and Peninsular Ranges bordering the Mojave and Colorado Deserts north to Kern County. Most common from 2,000-5,000 feet (610-1524 m). In San Diego County: San Felipe Valley, Jacumba, Laguna Mountain, McCain Valley, and possibly Ranchita.

Sources: 1, 13, 48, 67, 68, 148, 308

37500 Montane Chaparral

Description: Combines several Montane Chaparrals.

Site Factors: High mountains in San Diego County on dry exposures and integrated with coniferous forests.

Characteristic Species: In San Diego County: *Ceanothus palmeri, Quercus wislizenii, Arctostaphylos glandulosa, A. pringlei*, and *Eriodictyon trichocalyx.*

Distribution: In San Diego County: dry exposures of Laguna, Cuyamaca, Palomar and Hot Spring Mountains.

Sources: 308

37510 Mixed Montane Chaparral

Description: A dense, heterogeneous, sclerophyllous thicket dominated by *Ceanothus cordulatus, Castanopsis sempervirens*, and any of several species of *Arctostaphylos* or *Ceanothus*. Understories typically are very sparse except in the few years immediately following fire. Most plants are under 5 feet tall. Canopies usually are not quite closed.

Site Factors: Steep, usually south-facing slopes in the coniferous zones. Much of the annual precipitation cones as snow, leading to shorter seasons (and hence, slower post-fire recovery) than in lower elevation chaparrals. Some of these sites appear to be edaphic disclimaxes (due to shallow, rocky soil) rather than seral stages such as in many Montane Ceanothus Chaparrals (37530).

Characteristic Species: *Arctostaphylos glandulosa, A. glauca, A. manzanita, A. nevadensis, A. patula, Artemisia tridentata, Chrysolepis sempervirens, Ceanothus cordulatus, C. leuccdermis, percocarpus betuloides, Heteromeles arbutifolia, Holodiscus microphyllus, Prunus emarginata, P. ilicifolia, Quercus dumosa,Rhus ovata*

Distribution: Widely scattered in the Sierran foothils, the cooler heights of the Coast Ranges and the Transverse and Peninsular ranges of southern California, typically between 4000 and 11000 feet. In San Diego County: Above 4500' to the summits on dry exposures of Laguna, Cuyamaca, Palomar and Hot Spring Mt.

Sources: 1, 68, 137, 150

37520 Montane Manzanita Chaparral

Description: Dense 2-5 m tall chaparrals dominated by any of several species of manzanita. May occur as a post-fire successional stage in burned Westside Ponderosa Pine Forest (84210), Sierran Mixed Conifer Forest (84230), White Fir Forest (84240, 85320), or Jeffery Pine Forest

(85100). Plants dormant during winter, most active in late spring and early summer.

Site Factors: Similar to and often intergrading with Upper Sonoran Mixed Chaparrals (37100), but generally at higher elevations and therefore cooler and moister. Often immediately below or on rockier or more xeric sites than Westside Ponderosa Pine Forest (84210).

Characteristic Species: *Arctostaphylos glandulosa, A. manzanita, A. mariposa, A. mewukka, A. nevadensis, A. patula, A. pungens, A. viscida, Ceanothus cuneatus*

Distribution: Scattered in Klamath and North Coast Ranges south to Lake County. Common in the western foothills of the Cascade-Sierra south to Yuba and Nevada counties (2,000-4,000 feet), scattered from there south in the Sierra to Kern County (3,000-5,500) and the higher mountains of southern California.

Sources: 68, 140, 141, 148, 149

37530 Montane Ceanothus Chaparral

Description: Dense, 1-3 m tall mostly sclerophyllous chaparral dominated by any of several species of *Ceanothus*. Plants winter-dormant, most active in late spring and early summer. These stands are taller (to 10 feet) and much denser than other Montane Chaparrals.

Site Factors: Similar to and often intergrading with Upper Sonoran Mixed Chaparral (37100), but generally higher (therefore cooler and moister). Most stands are successional after fire, landslide, gold mining, or other catastrophic disturbances. Best developed on dry, exposed sites.

Characteristic Species: *Amelanchier pallida, Arctostaphylos parryana, A. patula, Ceanothus integerrimus, C. leucodermis, C. velutinus, Holodiscus boursieri, H. microphyllus, Lonicera involucrata, Prunus ernarginata, Quercus chrysolepis, Sorbus scopulina*

Distribution: Scattered widely in the lower elevation conifer zones (5000- 8000 feet) throughout California.

Sources: 68, 140, 156

37540 Montane Scrub Oak Chaparral

Description: A dense, 1-5 m tall shrub field that is winter-deciduous, fire resistant.

Site Factors: Deep, rich, heavy soils at higher (therefore moister and cooler) elevations than Mixed or Chamise Chaparrals (3000-7000 feet).

Characteristic Species: *Quercus garryana semota, Q. chrysolepis, Ceanothus leucodermis, Juniperus occidentalis, Pinus monticola, Quercus vaseyana*
Distribution: Scattered widely in the lower elevation conifer zones (5000- 8000 feet) throughout California
Sources: 11, 13

37800 Upper Sonoran Ceanothus Chaparral

37810 Buck Brush Chaparral
Description: A dense chaparral to ~3 m tall, clearly dominated by *Ceanothus cuneatus* with some admixture of *Adenostoma fasciculatum*. Cover is higher than in Chamise Chaparral (37200) but is not so dense because the branches are not so interwoven.
Site Factors: Dry slopes and alluvial fans, usually below ~6,000 feet. This may be a climax chaparral in parts of its range, but it clearly is seral to some deciduous oak woodlands (71110-71140) or Lower Montane Coniferous Forests (84000) at many sites.
Characteristic Species: *Adenostoma fasciculatum, Ceanothus cuneatus, Garrya fremontii, Heteromeles arbutifolia, Quercus dumosa, Rhus diversiloba*
Distribution: Widely distributed from southwestern Oregon to northern Baja California, especially in the north where it appears to replace Chamise Chaparral (37200).
Sources: 67, 148

37820 *Ceanothus crassifolius* Chaparral
Description: A stiff, gray-green chaparral to 2-3 m tall, dominated by *Ceanothus crassifolius* and *Adenostoma fasciculatum*, with virtually no *Arctostaphylos*. The *Ceanothus* tends to die out after about 40 years, leading to a gradual thinning of old stands. There is considerably more leaf litter than in Chamise Chaparral (37200).
Site Factors: Rather xeric sites with shallow, stony soils, usually below about 4000 feet. This too may be a fire-dependent seral type. Intergrades on more xeric sites with Chamise Chaparral (37200); on more mesic sites with Coast Live Oak (71160) or Englemann Oak Woodland (71180) or with Whitethorn Chaparral (37532)
Characteristic Species: *Adenostoma fasciculatum, Ceanothus crassifolius, Heteromeles arbutifolia, Quercus dumosa, Rhus ovata, Ribes malvaceum*

Distribution: Very common along the coastal side of the Transverse and peninsular ranges from Santa Barbara County south to Baja, usually below 4000 feet.
Sources: 68, 143

37900 Scrub Oak Chaparral

Description: A dense, evergreen chaparral to 20 feet tall, dominated by *Quercus dumosa* with considerable *Cercocarpus betuloides*. In San Diego County, *Quercus berberidifolia* is often the dominant (over 50% cover) and usually occurs in small patches within a variety of other vegetation communities.

Site Factors: Somewhat more mesic than many chaparrals, and often occurring at slightly higher elevations (to ~ 5,000 feet). These more favorable sites recover from fire more quickly than other chaparrals. Substantial leaf litter accumulates. In San Diego County, this usually on north-facing or otherwise mesic slopes and can occur at various elevations.

Characteristic Species: *Arctostaphylos glandulosa, Ceanothus integerrimus, C. leucodermis, C. thrysiflorus, Cercocarpus betuloides, Fraxinus dipetala, Galium angustifolium, Garrya veatchu, Heteromeles arbutifolia, Lonicera* spp., *Pickeringia montana, Prunus ilicifolia, Quercus berberidifolia, Q. dumosa, Q. wizlizenii frutescens, Rhamnus californica, R. ilicifolia, Toxicodendron diversilobum*

Distribution: Western Sierran foothills and North Coast ranges from Tehama County south through the southern California mountains to Baja California. In San Diego County: most often on Cleveland National Forest, ridges on the east end of Henshaw Valley, McCain Valley.

Sources: 68, 143, 308

37A00 Interior Live Oak Chaparral

Description: A dense, tall (to 20 feet) chaparral dominated by *Quercus wislizenii* and *Q. dumosa* with several other sclerophylls also in the canopy. Interior live oak readily resprout following fire. Persistent leaf litter and dense canopies preclude most understory plants.

Site Factors: This is a fairly mesic chaparral of valleys and foothills away from the immediate coast, especially in Lower Montane Coniferous Forests (84000) where it frequently is a fire-disclimax. Often interdigitates with Blue Oak Woodland or Chamise Chaparral on adjacent south-facing slopes or on sites with shallower soils or poorer drainage. Recovers rapidly after fire.

Characteristic Species: *Aesculus californica, Arctostaphylos glandulosa, A. glauca, Ceanothus leucodermis, Ceanothus papillosus* (including var. *roweanus*), *Cercocarpus betuloides, Fraxinus*

dipetala, Heteromeles arbutifolia, Pinus attenuata, P. sabiniana, Prunus ilicifolia, Quercus agrifolia, Q. chrysolepis, Q. douglasii, Q. dumosa, Q. wislizenii (including var. *frutescens*), *Rhamnus californica, R. ilicifolia, Rhus ovata, Toxicodendron diversilobum*

Distribution: Extensive in the Sierran foothills from Shasta to Kern counties and North Coast Ranges south to Lake and Mendocino counties. Discontinuous south through the Central Coast, Transverse, and Peninsular ranges to northern Baja California. Intergrades at lower elevations with other more xeric chaparrals; at higher elevations with Interior Live Oak (81330) or Canyon Live Oak Forest (31320).

Sources: 27, 28, 32, 67, 68, 142, 143, 148, 149

37B00 Upper Sonoran Manzanita Chaparral

Description: A dense chaparral to 15 feet tall in which dominance is shared by chamise and various species of manzanita.

Site Factors: Most stands appear to be disturbance followers, establishing after fire, logging, hydraulic mining, or other disruptions. Young conifers (especially *Abies concolor* or *Pinus ponderosa*) often can be found beneath the shrub canopy in these seral stands.

Characteristic Species: *Adenostona fasciculatum, Arctostaphylos glandulosa, A. glauca, A. mariposa, A. mewukka, A. nevadensis, A. patula, A. viscida, Ceanothus leucodermis*

Distribution: Widespread in the Sierran foothills and Coast Ranges, usually at elevations higher than Chamise Chaparral (37200), but lower than montane chaparral (37500). Somewhat more patchily distributed along the coastal side of the Transverse and Peninsular ranges, typically between 2500 and 5000 feet.

Sources: 68, 148, 149

37C00 Maritime Chaparral

37C30 Southern Maritime Chaparral

Description: A low, fairly open chaparral dominated by Wart-stemmed ceanothus (*Ceanothus verrucosus*) and Del Mar Manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia)*. Has also been described as Coastal Mixed Chaparral.

Site Factors: Weathered sands within the coastal fog belt. Fire appears necessary for continued reproduction of many characteristic species.

Characteristic Species: *Adenostona fasciculatum, Arctostaphylos glandulosa crassifolia, Baccharis vanessae, Ceanothus verrucosus, Cercocarpus minutiflorus, Cneoridium dumosum, Comarostaphylos diversifolia, Coreopsis maritima, Corethrogyne filaginifolia linifolia, Dichondra occidentalis, Heteromeles arbutifolia, Pinus torreyana,*

Quercus dumosa, Malosma laurina, R. ovata, Salvia clevelandii, Xylococcus bicolor, Yucca schidigera

Distribution: In San Diego County: Today restricted to coastal areas such as Torrey Pines State Reserve, along the San Dieguito River Valley, Rancho Santa Fe, and a few other scattered localities.

Sources: 1

37G00 Coastal Sage-Chaparral Transition

Description: A mix of sclerophyllous, woody chaparral species and drought-deciduous, malacophyllous sage scrub species. *Adenostoma fasciculata* and *Artemesia californica* are dominant and equal in cover. Generally *Malosma laurina, Salvia mellifera* and *Rhus integrifolia* are more common in coastal sage scrub, while *Ceanothus* spp. and *Xylococcus bicolor* are more common in chaparrals.

Site Factors: Apparently a post-fire successional community (but not in all situations). Site factors need clarification. A catch-all type intermediate between Coastal Scrubs (32000) and chaparrals (37000).

Characteristic Species: *Adenostoma* spp., *Artemisia californica, Ceanothus* spp., *Salvia mellifera, Toxicodendron diversilobum*

Distribution: Outer Coast Ranges and Peninsular Range from the Big Sur Coast south to Baja. An infrequent mixture these usually separate plant associations, occurring in specific climatic regions.

Sources: 89, 308

37K00 Montane Buckwheat Scrub (# *renamed and split*)

Description: A nearly monoculture community of flat-topped buckwheat found at higher elevations in San Diego County. At lower elevations and where disturbance has occurred this is often Flat-topped Buckwheat (32800#).

Site Factors: Found at higher elevations in San Diego County. Usually on sandy soils around mountain meadows.

Characteristic Species: *Eriogonum fasciculatum* (several varieties), *Eriogonum wrightii*.

Distribution: In San Diego County: Pine Valley and other mountain areas.

39000 Upper Sonoran Subshrub Scrub

Description: A low, fairly penetrable scrub of soft-wooded, summer-dormant, drought- tolerant shrubs. Dominance varies among sites, but usually includes *Ericameria linearifolia, Eriogonum fasciculatum polifolium, Isomeris arborea arborea,* or *Ephedra californica*, with many annuals derived from nearby grasslands filling the spaces between the shrubs.

Site Factors: Usually of fairly well drained soils derived from sandstone, shale, or even sterile white diatomaceous deposits. Intergrades at lower elevations

with some chaparrals (37000). In San Diego County this occurs at high evelvations.

Characteristic Species: *Amsinckia furcata, A. vernicosa, Camissonia californica, Clarkia temblorensis, Eastwoodia elegans, Ephedra californica, Eriogonum fasciculatum (polifolium), E. temblorense, E. wrightii, Gutierrezia bracteatus, Haplopappus acradenius bracteosus, Ericameria linearifolia, Isomeris arborea globosa, Mentzelia pectinata, Opuntia* spp.*, Stylomecon heterophylla, Wyethia ovata.* In San Diego County, grasses include *Poa secunda, Elymus elemoides (Sitanion), Achnatherum* spp.

Distribution: Arid hills surrounding the southern and western San Joaquin Valley, from the Adobe Hills (northwest of Bakersfield) across the Tehachipi and San Emigdio ranges and north along the rainshadow of the Inner South Coast Ranges to Alameda County. In San Diego County: Low hills with dry exposures surrounding Cuyamaca Meadow, Henshaw Basin, Chihuahua Valley, Corte Madera, and McCain Valley.

Sources: 13, 308

40000 Grasslands, Vernal Pools, Meadows, and other Herb Communities

42000 Valleys and Foothill Grassland

42100 Native Grassland

42110 Valley Needlegrass Grassland

Description: A midheight (to 2 ft) grassland dominated by perennial, tussock-forming *Stipa* (*Nasella*) *pulchra*. Native and introduced annuals occur between the perennials, often actually exceeding the bunchgrasses in cover. In San Diego County, native perennial herbs such as *Sanicula*, *Sidalcea*, *Sisirynchium*, *Eschscholzia* or *Lasthenia* are present. The percentage cover of native species at any one time may be quite low, but is considered native grassland if 20% aerial cover of native species is present.

Site Factors: Usually on fine-textured (often clay) soils, moist or even waterlogged during winter, but very dry in summer. Often interdigitates with Oak Woodlands (71100) on moister, better-drained sites. In San Diego County this becomes Montane Perennial grassland above approximately 2000 feet in elevation.

Characteristic Species: *Achillea borealis, Achyrachaena mollis, Agoseris heterophylla*, [*Avena fatua*], *Bloomeria crocea, Brodiaea lutea,* [*Bromus diandrus, B. mollis, B. madriatensis* ssp. *rubens*], *Chlorogalum pommeridianum, Clarkia purpurea, Dodecatheon jefferyi, Eschscholzia* spp., *Lasthenia* spp., *Melica californica, M. imperfecta, Orthocarpus attenuatus, Plantago hookeriana californica, Poa scabrella, Sanicula* spp., *Sidalcea* spp., *Sisirynchium* spp., *Stipa cernua, Stipa (Nasella) pulchra.*

Distribution: Formerly extensive around the Sacramento, San Joaquin, and Salinas Valleys, as well as the Los Angeles Basin, but now much reduced. The relationship of this type to the Potrero Grasslands of the Peninsular Ranges needs clarification. In San Diego County: Alpine (Wright's Field), Ramona, Olivenhain, San Marcos, Camp Pendleton, Rincon, Mesa Grande (?), Eagle Peak Road (?), and Otay Mesa.

Sources: 1, 134, 172, 175, 176, 182, 183, 189, 194, 198, 308

42120 Valley Sacaton Grassland

Description: Midheight [to 3 ft] tussock-forming grassland dominated by *Sporobolus airoides*.

Site Factors: Fine textured, poorly drained, usually alkaline soils. Most sites have seasonally high water tables or are overflowed during winter flooding. Intergrades and often co-occurs with Alkali Meadow (45310) and Northern Claypan Vernal Pool (44120).

Characteristic Species: *Distichlis spicata, Hordeum depressum, Sporobolus airoides*

Distribution: Formerly extensive in the Tulare Lake Basin and along the San Joaquin Valley trough north to Stanislaus and Contra Costa Counties, now much reduced. In San Diego County: Ramona, Cottonwood Valley, Jacumba, San Marcos

Sources: 134, 175, 176, 198, 308

42130 Saltgrass Grassland #

Description: Low (>20cm) grassland dominated by saltgrass (*Distichlis spicata*).

Site Factors: Fine textured, usually alkaline soils, often poorly drained. Intergrades and often co-occurs with Alkali Meadow (45310) and various riparian habitats.

Characteristic Species: *Distichlis spicata*

Distribution: In San Diego County: Ramona, Lake Hodges, and other areas throughout the county.

42200 Non-native Grassland (or Annual Grassland)

Description: A dense to sparse cover of annual grasses with flowering culms 0.2-0.5 (1.0) m high. Often associated with numerous species of showy-flowered, native annual forbs ("wildflowers"), especially in years of favorable rainfall. In San Diego County the presence of *Avena*, *Bromus*, *Erodium*, and *Brassica* are common indicators. In some areas, depending on past disturbance and annual rainfall, annual forbs may be the dominant species; however, it is presumed that grasses will soon dominate. Germination occurs with the onset of the late fall rains; growth, flowering, and seed-set occur from winter through spring. With a few exceptions, the plants are dead through the summer-fall dry season, persisting as seeds.

Remnant native species are variable. This can include grazed and even dry-farmed (i.e., disked) areas where irrigation is not present.

Site Factors: On fine-textured, often clay soils, moist or even waterlogged during the winter rainy season and very dry during the summer and fall. Oak Woodland (71100) is often adjacent on moister, better drained soils.

Characteristic Species: [*Avena barbata*], [*A. fatua*], [*Brassica* spp.], [*Brachypodium distachyon*], [*Bromus mollis*], [*B. rigidus*], [*B. rubens*], [*Centaurea melitensis*], [*Erodium botrys*], *E. cicutarium, Eschscholtzia californica, Gilia* spp., *Hemizonia* spp. (= *Dienandra*; summer), *Lasthenia* spp., *Layia* spp., [*Lolium multiflorum*], [*Hirschfeldia incana*], *Lupinus* spp., *Lepidiun dictyotum*, [*Medicago hispida*], *Nemophila menziesii, Orthocarpus* spp., *Phacelia* spp., *Plantago* spp., [*Schismus arabica*], *Vulpia megalura, V. microstachys*

Distribution: Valleys and foothills of most of California except for the north coastal and desert regions. Usually below 3000 ft., but reaching 4000 ft. in the Tehachapi Mtns. and interior San Diego Co. Intergrades with Coastal Prairie (41000) along the central coast. Formerly occupied large portions of the Sacramento, San Joaquin, and Salinas Valleys as well as the Los Angeles Basin, areas that are now agricultural or urban. Throughout San Diego County, some notable areas include Otay Mesa, Barona, parts of Henshaw Valley, Borrego Springs, Love Valley, Santa Maria Valley and Rancho Guejito.

Sources: 1, 13, 134, 171, 172, 176, 181-184, 192, 194, 198, 308

42210 Non-Native Grassland: Broadleaf-dominated #

Description: Subset of Non-native Grasslands (42200), which is dominated by one or several non-native, invasive broadleaf species. This designation should only be applied where non-native broadleaf species account for more than 50% of the total vegetative cover.

Site Factors: Disturbance and/or a nearby seed source have resulted in the establishment of extensive and persistently dominant broadleaf species.

Characteristic Species: [*Brassica nigra*], [*Hirschfeldia incana*], [*Foenicularium vulgare*], [*Centaurea* spp.], and other non-native, invasive broadleaf species. Other species as above in Non-native Grasslands (42200).

Distribution: In San Diego County this has become increasingly common in coastal areas such as Camp Pendleton, Carlsbad Highlands, Oceanside, and Otay Mesa.

42211 Non-Native Grassland: Artichoke-Thistle-dominated #

Description: Subset of above, dominated primarily by Artichoke-thistle ([*Cynara cardunculus*]). This designation should only be applied where Artichoke-thistle accounts for more than 50% of the total vegetative cover.

Site Factors: Disturbance and/or a nearby seed source have resulted in the establishment of extensive Artichoke-thistle.
Characteristic Species: [*Cynara cardunculus*], others as above in Non-native Grasslands (42200).
Distribution: In San Diego County this has become increasingly common in the northern coastal areas such as Rancho Bernardo, Santa Fe Valley/Lake Hodges area, Ramona, Carlsbad Highlands, and Oceanside.

42300 Wildflower Field

Description: An amorphous grab bag of mostly native, herb-dominated types noted for conspicuous annual wildflower displays. Dominance varies from site to site and from year to year at a particular site. In San Diego County, often a subtype of Creosote Bush Scrub (33100), Wet Montane Meadow (45110), Foothill/Montane Perennial Grassland (42400), and formerly on coastal mesas.

Site Factors: Usually on fairly poor sites (droughty, low in nutrients), associated with Grasslands or Oak Woodlands on surrounding, more productive sites. In San Diego County, mostly on sandy soils.

Characteristic Species: *Eschscholtzia californica, Gilia bicolor, Layia platvglossa, Lupinus bicolor, Orthocarpus attenuatus, O. purpuresens, Oenothera* spp.

Distribution: Valleys and foothills of the Californian Floristic Province except the north coast (too wet) region. Below about 2000 ft. in the north, 4000-5000 ft. in the south. In San Diego County: Lower Coyote Creek near Borrego Springs, Mataguay, Upper Cuyamaca Valley.

42400 Foothill/Mountain Perennial Grassland*

Description: Generally isolated grasslands within Oak or Pine Woodland or Chaparral and associated with meadows with a range of Marshland, Big Basin Sagebrush or Steppe.

Characteristic Species: *Nasella pulchra, Leymus triticoides, Hordeum brachyantherum, Agrostis spp., Muhlenbergia rigens, Poa pratensis, Cirsium tioganum, Pteridium aquilinum, Iris missouriensis*

Distribution: Corte Madera, upper Rancho Guejito, Spoke Ranch, and all major valleys in the Palomar Cuyamaca, and Laguna Mountains.

42470 Transmontane Perennial Grassland*
(formerly Transmontane Dropseed Grassland*)

Description: Montane grasslands dominated by warm season grasses. Sand Dropseed is not normally a dominant element.

Site Factors: Montane areas in San Diego County.

Characteristic Species: *Nasella (Stipa) cernua, Aristida purpurea, Sporobolis cryptandrus, Bouteloua* spp., *Leymus triticoides, Lessingia glandulifera*.

Distribution: Lake Henshaw Valley, Chihuahua Valley and east to Ranchita

44000 Vernal Pool

Description: Vernal pools are seasonally flooded depressions that support a distinctive living community adapted to extreme variability in hydrologic conditions (seasonally very dry and very wet conditions). Although vernal pools are often associated with hummocks or mima-mounds, this feature is not always present. In San Diego, vernal pools often retain pooled water for about 2 weeks after significant rain events; for vernal pools in swale systems water usually remains at least 2 weeks after surface flows cease. Vernal pools can be differentiated from other temporary wetlands by the following criteria: (1) the basin is at least partially vegetated during the normal growing season or is unvegetated due to heavy clay or hardpan soils that do not support plant growth; and (2) the basin contains at least one vernal pool indicator species (e.g., *Psilocarphus* spp., *Downingia cuspidta, Eryngium aristulatum* var. *parishii*, or crustaceans – *Branchinecta* spp., *Streptocephalus* spp., and others).

Source: 305

44320 San Diego Mesa Vernal Pool

44321 San Diego Mesa Hardpan Vernal Pool

Description: Very similar in aspect to Northern Hardpan Vernal Pools, but with different species composition. A low, amphibious, herbaceous community dominated by annual herbs and grasses. Germination and growth begin with witnter rains, often continuing even when inundated. Rising spring temperatures evaporate the pools, leaving concentric banks of vegetation that colorfully encircle the drying pool. Surrounding high ground is usually mantled with chamise chaparral (37200). Pool sizes range from very small to moderate (up to ca. 700 square meters).

Site Factors: Small depressions in flat-topped marine terraces. Fe-Si cemented hardpan prevents downward drainage of rainwater. Soils often are stonier than Northern Hardpan Vernal Pools, and are always coarser and redder than San Diego Mesa Claypan Vernal Pools (44322).

Characteristic Species: *Eryngiun aristulatum parishii, Myosurus minimus, Navarretia fossalis, Ophioglossum californicum, Pogogyne nudiuscula*

Distribution: Formerly extensive on the flat marine terraces north of San Diego County, but now almost extirpated by urban expansion.

44322 San Diego Mesa Claypan Vernal Pool

Description: Similar to Northern Claypan Vernal Pools and San Diego Mesa Hardpan Vernal Pools, but less markedly saline/alkaline. Surrounded by Grassland rather than Chamise chaparral.

Site Factors: Soils decidedly finer textured and greyer than San Diego Mesa Hardpan Vernal Pools, and lacking an iron cemented hardpan.

Characteristic Species: *Myosurus minimus* ssp. *apus, Navarretia fossalis, Orcuttia californica, Plagiobothrys* spp., *Psilocarphus* spp., *Pogogyne abramsii*

Distribution: Restricted to marine terraces between San Diego and Ensenada, Mexico and much reduced by agricultural and urban development. Also occurs in valley grassland with clay soils such as in Ramona, Poway and San Marcos.

45000 Meadows and Seeps

45100 Montane Meadow

Description: Dense growth of sedges and other perennial herbs, usually from 0.5-1 m high, but with sane taller herbs to 2 m. Main growth period from late spring through summer (sunnier only at higher elevations); flowering mostly in summer; dormant in winter (from fall through spring at higher elevations). Montane Meadows are subdivided into Wet (45110) and Dry (45120) subtypes. Wet Montane Meadows have soils that remain saturated throughout the year.

Site Factors: On fine-textured, more or less permanently moist or wet soils. Adjacent forest or scrub are on coarser, better drained soils. Often a successional stage in the filling of lakebeds with soil, and characterized by young trees encroaching from the margins. On seasonally drier, but still fine-textured soils may intergrade with Coastal Prairie (41000) in the North Coast Ranges, Valley and Foothill Grasslands (42000) in the Sierra Nevada foothills, and Great Basin Grassland (43100) or Great Basin Sagebrush (35200) in northeastern California. Both Wet and Dry types may occur in a given meadow.

Characteristic Species: *Camassia quamash, Carex bolanderi, C. rostrata, C. vesicaria, Dodecatheon jeffreyi, Glyceria elata, Eleocharis acicularis bella, Heracleum sphondylium* ssp. *montanum, Juncus nevadensis, Lupinus polyphyllus* ssp. *superbus, Muhlenbergia filiformis, Pteridium aquilinum, Scirpus congdonii, S. crinlger, Veratrum californicum, V. fimbriatum* (in North Coast Ranges). Ratliff (195, 196) discusses several distinctions between Wet and Dry types.

Distribution: Scattered within the North Coast Coniferous Forests (82000), Lower Montane Forests (84000), and Upper Montane Forests (85000) of the North Coast Ranges, Klamath Ranges, Cascade Range, Sierra Nevada, Transverse and Peninsular ranges. Elevation from 1000-7000 ft. (300-2130 m) in the north to 5000-9000 ft. (1520-2740 m) in the south.
Sources: 1, 13, 48, 150, 174, 190, 195, 196

45110 Wet Montane Meadow
Description: Wide range of elevations. May also be associated with vernal pools or seeps and other meadow habitats. Yields to Freshwater Marsh (52400) at lower elevations.
Characteristic Species: *Juncus mexicanus, Carex* spp., *Muhlenbergia rigens, Iris missouriensis*. Often associated with many other wetland plants.
Distribution: In San Diego County: Cuyamaca Valley, Laguna Meadow, Menednhall Valley, Corte Madera, Thing Ranch, Ramona, Rancho Guejito, and wetter portions of all major valleys of Palomar, Cuyamaca and Laguna Mountains.

45120 Dry Montane Meadow
Description: Surrounds many of the montane meadows and grasslands. Yields to Sonoran Subshrub Scrub (39000).
Characteristic Species: *Eriogonum wrightii, Guttierizia sarothrae,* bulb species, annual wildflowers, and perennial grasses. Indicator species include *Artemesia dracunculus, Pteridium acquilinum, Grindelia hallii, Thermopsis macrophylla*.
Distribution: In San Diego County: around Cuyamaca Meadow, Volcan Mtn., Corte Madera

45300 Alkali Meadows and Seeps

45320 Alkali Seep
Description: Low-growing perennial herbs, usually forming relatively complete cover, growing throughout the year in areas with mild winters. Relatively few species.
Site Factors: Permanently moist or wet alkaline seeps.
Characteristic Species: *Distichlis spicata* var. *stricta, Najas marina, Nitrophila occidentalis, Potomogeton latifolius, P. pectinatus, Ruppia maritima, Zannichellia palustris, Malvella leprosa, Heliotropum curvassavicum, Sporobolus airoides, Iva hayesiana, Juncus sphaerocarpus* var. *acutis, Hemizonia acutis, H. laevis*
Distribution: Scattered throughout the desert regions of California; less common in other areas. Throughout San Diego County: usually in small extent in coastal and

transmontane, as part of narrow drainages or springs. In such as: Marron Valley, Jacumba Valley, Otay Ranch, Ramona, Del Dios, Campo and Lake Henshaw.

Sources: 48, 133

45400 Freshwater Seep

Description: Mostly perennial herbs, especially sedges and grasses, usually forming complete cover, often low-growing but sometimes taller, growing throughout the year in areas with mild winters.

Site Factors: Permanently moist or wet soil around freshwater seeps, often associated with grasslands or meadows.

Characteristic Species: *Carex* spp., *Juncus* spp., *Nasturtium officinale*, *Braccharis salicifolia, Sidaleca malviflora, Muhlengergia rigens*

Distribution: Scattered through most regions of California, probably most common in grassland habitats, uncommon in the deserts. Throughout San Diego County usually small in extent, as part of narrow drainages or springs in such places as Campo, Lake Henshaw, and Peñasquitos Canyon.

46000 Alkali Playa

Description: Usually low, grayish, microphyllous and succulent shrubs to ca. 1m tall. Total cover usually low due to wide spacing between shrubs and minimally developed understory. Indicated by dried polygons of cracked mud and alkaline soil crust. Typically very sparsely vegetated except where disturbed and invaded by *Sisymbrium* such as Ocotillo Wells airstrip. Often surrounded by Alkali Marsh (52310).

Site Factors: Poorly drained soils with high salinity and/or alkalinity due to evaporation of water that accumulates in closed drainages. Often with high water table and with salt crust on the surface.

Characteristic Species: *Allenrolfea occidentalis, Atriplex confertifolia, A. parryi, Sarcobatus vermiculatus*

Distribution: Closed basins of the Transmontane Deserts, and some smaller examples in the Central Valley. In San Diego County: Dry lakes at Lake Henshaw, Clark Dry Lake, Borredo Sink

Sources: 1, 133, 185

50000 BOG AND MARSH

52000 Marsh and Swamp

52100 Coastal Salt Marsh

52120 Southern Coastal Salt Marsh

Description: Similar to Northern Coastal Salt Marsh (52110) but with a longer, growing season and a greater abundance of suffrutescent species in the higher, drier sites. Southern "specialties" include *Atriplex watsonii, Batis maritima, Lyeium californicum, Monanthochloe littoralis, Sueda californica,* and *Salicornia subterminalis*

Site Factors: Very similar to Northern Coastal Salt Marsh but with warmer water and air temperatures. *Frankenia, Suaeda*, and/or *Salicornia* subterminalis often occur along the upper, landward edges of the marshes; *Salicornia bigelovii, S. virginica,* and *Batis maritima* at middle elevations; and *Spartina* closest to open water.

Characteristic species: *Amblyopappus pussilus, Atriplex watsonii, Batis maritima, Cressa truxiliensis, Cuscuta sallna, Distichlis spicata* var. *spicata, Frankenia grandifolia, Heliotropium* curassavicun, *Jaumea carnosa, Juncus acutus sphaerocarpus, Heliotropium, Limonium californicum, Carpobrotus aequilateralis, [Mesembryanthemum crystalmum], [M. nodiflorun], Monanthochloe littoralis, Salicornia bigelovii, Salicomia* spp., *Spartina foliosa, Suaeda califomica*

Distribution: Bays, lagoons, and estuaries along the coast from about Point Conception to the Mexican border. Integrades broadly with Northein Coastal Salt Marsh (52110) along the south central coast. Nowhere as extensive as the larger northern marshes, and now considerably reduced by land development activities. Good to fair examples occur at Goleta Slough and near Carpinteria, Santa Barbara Co.; Point Mugu, Ventura Co.; Upper Newport Bay, Orange Co.; and several small areas in San Diego Co.

Sources: 93, 132, 201, 204, 206

52200 Coastal Brackish Marsh

Description: Dominated by perennial, emergent, herbaceous monocots to 2 m tall. Cover is often complete and dense. Similar to Salt Marshes (52100) and to Freshwater Marshes (52400) with some plants characteristic of each.

Site Factors: Similar to Coastal Salt Marshes, but brackish from freshwater input, Salinity may vary considerably, and may increase at high tide or during seasons of low freshwater runoff or both. Usually intergrades with Coastal Salt Marshes toward the ocean and occasionally with Freshwater Marshes (52400) at the mouths of rivers, especially in the Sacramento-San Joaquin River Delta.

Characteristic species: *Carex harfordii, Carex obnupta, Carex* spp., *Distichlis spicata* var. *spicata, Juncus spp., Salicornia* spp., *Scirpus* spp., *Typha latifolia*

Distribution: Usually at the interior edges of coastal bays and estuaries or in coastal lagoons. Adjacent to several Salt Marshes (52110 and 52120). Most extensively developed around Suisun Bay at the mouth of the Sacramento-San Joaquin Delta.

Sources: 1, 93

52300 Alkali Marsh

52310 Cismontane Alkali Marsh

Description: Very similar to Coastal Brackish Marsh (52200) with many of the same species. Most growth and flowering occur in summer.

Site Factors: Standing water or saturated soil present during most or all of year. High evaporation and low input of fresh water render these marshes somewhat salty, especially during the summer. Probably similar to Coastal Brackish Marsh in quantitative range of saltiness, but more alkaline and usually with salts other than sodium chloride. Marshes that become mostly dry during the summer are Vernal Marshes (52500); those with a more constant input of fresh water are Coastal and Valley Freshwater Marshes (52410). Chenopod scrubs (36000) occur in areas with moist, highly alkaline soil that usually lack water at the surface. All of the above habitats may intergrade with Alkali Marshes.

Characteristic species: *Anemopsis califomica, Carex* spp., *Distichlis spicata* var. *stricta, Elymus triticoides, Frankenia grandifolia, Juncus mexicanus, Juncus* spp., *Pluchea purpurascens, Salicornia virginica, Typha angustifolia, Typha domingensis*

Distribution: Lake beds and other areas on the flood plains of the Sacramento and San Joaquin rivers. Also in low-lying areas of Kings and Kern counties in the southwestern San Joaquin Valley and occasionally near the Colorado River in eastern Riverside and Imperial counties. Elevation below 1000 ft. (300 m). Now much reduced in area by drainage and cultivation.

Sources: 1, 132, 133

52400 Freshwater Marsh

52410 Coastal and Valley Freshwater Marsh

Description: Dominated by perennial, emergent monocots to 4-5 m tall. Often forming completely closed canopies. *Scirpus* and *Typha* dominated types and their environmental and floristic distinctions require clarification.

Site Factors: Quiet sites (lacking significant current) permanently flooded by fresh water (rather than brackish, alkaline, or variable). Prolonged saturation permits accumulation of deep, peaty soils.

Characteristic species: *Carex lanuginosa, C. senta, Cyperus esculentus, C. eragrostis, Eleocharis* spp.*, Hydrocotyl verticillata triradiata, Limosella aquatica, Phragmites australis, Scirpus acutus, S. americanus, S. californicus, S. robustus, Sparganiun eurycarpum, Typha angustifolia (?), T. domingensis, T. latifolia, Verbena bonariensis*

Distribution: Occasional along the coast and in coastal valleys near river mouths and around the margins of lakes and springs. Most extensive in the upper portion of the Sacramento-San Joaquin River Delta. Conmon in the Sacramento and San Joaquin Valleys in river oxbows and other areas on the flood plain. Occasional along the Colorado River on the California-Arizona border. Now much reduced in area through its entire range.

Sources: 1, 13

52420 Transmontane Freshwater Marsh

Description: Very similar to Coastal and Valley Freshwater Marsh (52410) and to Transmontane Alkali Marsh (52320), sharing species from both. Differs from Coastal and Valley Freshwater Marsh in having a shorter growing season, confined more strictly to the sunmer.

Site Factors: Very similar to Coastal and Valley Freshwater Marsh but subject to much lower temperatures in winter, often well below freezing. Similar to Transmontane Alkali Marsh (52320), often intergrading with it but with a steadier or more abundant freshwater input. Often located immediately adjacent to rivers or springs with Transmontane Alkali Marsh further removed from the freshwater source.

Characteristic species: *Carex simulata, Carex* spp.*, Cer tophylum demersum, Elodea canadensis, Eleocharis* spp.*, Juncus* spp.*, Ludwigia* spp.*, Najas marina, Phragmites australis, Potomogeton* spp.*, Ruppia maritima, Sagittaria* spp.*, Scirpus acutus, S. fluviatilis, S. nevadensis, Scirpus spp., Typha latifolia, Zannichellia palustris*

Distribution: Same general distribution as Transmontane Alkali Marsh (52320). Lake beds, margins of springs and river bottomlands of the Modoc Plateau in eastern Siskiyou Co., Modoc Co., and Inyo Co., especially near Bridgeport and in Owens Valley. Elevation 3500 - 7500 ft.

Sources: 1, 48, 208

52430 Montane Freshwater Marsh

Description: Similar to Coastal and Valley Freshwater Marsh (52410) and to Bogs and Fens (51000), with which many species are shared.

Site Factors: Similar to Coastal and Valley Freshwater Marsh but with a shorter growing season due to cold winters. Less acidic and nutrient-rich than Bogs or Fens.

Characteristic species: *Carex athrostachya, C. nebracensis, Eriophorum, Scirpus acutus, S. americanus*, others?

Distribution: Widely scattered throughout Montane California, though less frequent in the Transverse and Peninsular ranges.

Sources: 1, 208

52440 Emergent Wetland *

Description: Generally persistent wetlands dominated by low growing, perennial wetland species. These can be found in channels, seeps and springs, floodplains, margins of lakes and rivers, and various basins such as pools and ponds, palustrine lakes, montane meadows, and dune swales.

Site Factors: These may be freshwater or alkali wetlands. In San Diego County, these are often in previously disturbed areas where wetlands are emerging, but have not yet established a full suite of species; however, disturbance is not a necessary element of this vegetation community.

Characteristic species: *Carex* spp., *Eleocharis* spp., *Juncus* spp., *Rumex* spp., *Sparganium eurycarpum*, and many others.

Distribution: In San Diego County: found throughout the county in wet areas.

Sources: 307

52500 Vernal Marsh

52510 Herbaceous wetland #

Description: Seasonal wetlands supporting mainly annual species. These areas do not support species (*Typha*, *Scirpus*, and *Juncus*) typically associated with Freshwater Marsh (52400).

Site Factors: In San Diego County, these wetlands may only occur during wetter than average years and are usually found in swale areas or adjacent to drainages.

Characteristic species: Annuals such as *Mimulus guttatus* and *Polypogon monospeliensis*.

Distribution: In San Diego County: found throughout the county in wet areas.

60000 Riparian and Bottomland Habitat

61000 Riparian Forests

61300 Southern Riparian Forest

Description: Dense riparian forests that cannot be differentiated to categories below.

Site Factors: Found along steams and rivers.

Characteristic Species: *Platanus racemosa, Populus* spp., and many other wetland plants.

Distribution: San Luis Rey River Valley, Pamo Valley, San Diego River, Cottonwood Creek, upper San Diego River, lower Peñasquitos Creek, Poway Creek.

Sources: 308

61310 Southern Coast Live Oak Riparian Forest

Description: Dense riparian forests dominated by evergreen sclerophyllous trees (*Quercus agrifolia*) with a closed, or nearly-closed, canopy. This type appears to be richer in herbs and poorer in understory shrubs than other riparian communities. A homogenous mixture of Coast Live Oak Woodland (71161) and Southern Riparian Woodland (61300), especially if the riparian elements are not substantial or are discontinuous.

Site Factors: Bottomlands and outer floodplains along larger streams, on fine-grained, rich alluvium.

Characteristic Species: *Acer macrophyllum, Artemisia douglasiana, Cardamine californica, Eucrypta chrysanthemifolia, Heteromeles arbutifolia, Keckiella cordifolla, Lonicera hispidula, Marah macrocarpus, Pholistoma auritum, Quercus agrifolia, Rhus trilobata, Rosa californica, Rubus ursinus, Sambucus mexicana, Symphoricarpos mollis, Toxicodendron diversilobum, Umbellularia californica*

Distribution: Canyons and valleys of coastal southern California, mostly south of Point Conception. In many many drainages throughout San Diego County: DeLuz Creek, West Fork San Vicente River, Pamo Valley, Lower Santa Maria Creek

Sources: 11, 68, 89, 282, 308

61320 Southern Arroyo Willow Riparian Forest *

Description: Winter-deciduous riparian forests dominated by moderately tall broadleafed trees and dominated by arroyo willow (*Salix lasiolepis*) and having closed, or nearly-closed canopies. Understories usually are shrubby willows.

Site Factors: Sub-irrigated and frequently overflowed lands along rivers and streams.

Characteristic Species: *Artemisia douglasiana, Baccharis salicifolia, Marah macrocarpus, Platanus racemosa, Populus fremontii, P. trichocarpa, Salix gooddingii, S. hindsiana, S. lasiandra, S. lasiolepis, Urtica holosericea*
Distribution: Along perennially wet stream reaches

61330 Southern Cottonwood-Willow Riparian Forest
Description: Tall, open, broadleafed winter-deciduous riparian forests dominated by *Populus fremontii*, *P. trichocarpa*, and several tree willows. Understories usually are shrubby willows.
Site Factors: Sub-irrigated and frequently overflowed lands along rivers and streams. The dominant species require moist, bare mineral soil for germination and establishment. This is provided after flood waters recede, leading to uniform-aged stands in this seral type.
Characteristic Species: *Artemisia douglasiana, Baccharis salicifolia, Marah macrocarpus, Platanus racemosa , Populus fremontii, P . trichocarpa, Salix gooddingii , S. hindsiana, S. lasiandra, S. lasiolepis, Urtica holosericea*
Distribution: Along perennially wet stream reaches of the Tranverse and Peninsular ranges, from Santa Barbara County south to Baja California Norte and east to the edge of the deserts.
Sources: 11, 68, 277, 282

61500 Montane Riparian Forest

61510 White Alder Riparian Forest
Description: Medium-tall broadleafed deciduous streamside forests dominated by *Alnus rhombifolia*, with a shrubby, deciduous understory. Stands in the Coast Ranges have abundant *Salix*, *Baccharis salicifolia*, *Symphoricarpos* spp., *Rosa californica*, and *Toxicodendron diversilobum*, while Sierran stands have understories rich in *Cornus stolonifera*, *Fraxinus latifolia*, and *Rhododendron ocidentale*. These two types probably should be separated. Riparian alder forests in southern California need study — these too may be separable.
Site Factors: Best developed along rapidly flowing, well-aerated perennial streams with coarse bedloads that reflect high stream power during spring runoff. These streams typically flow in bed rock-constrained, steep sided canyons, so the riparian corridor typically is rather narrow. In San Diego County, somewhat determined by elevation where *Alnus rhombifolia* is incorporated with other elements of Souther Riparian Woodland (61300).
Characteristic Species: *Acer macrophyllum, Alnus rhombifolia, Baccharis salicifolia, Cornus sessilis, C. stolonifera, Fraxinus latifolia, Rhododendron occidentale, Salix* spp., *Toxicodendron diversilobum*

Distribution: Perennial streams in incised canyons of the lower Sierra Nevada, Coast, Transverse, and Peninsular ranges, usually below about 6000 feet. In San Diego County: cold springs in the Cuyamaca Mountains, upper parts of San Luis Rey River (above La Jolla Indian Reservation and west fork), Pauma Creek, Plaisted Creek, and major drainages of Hot Springs Mts., Volcan Mts., Cuyamaca Mts., Laguna Mts.

Sources: 217, 278, 308

61800 Colorado Riparian Forest

61810 Sonoran Cottonwood-Willow Riparian Forest

Description: Winter-deciduous, broadleafed streamside forests to about 60 feet tall, dominated by *Populus fremontii macdougallii* with dense understories of several *Salix* species. There appear to be virtually no compositional data available for this type.

Site Factors: Deep, well-watered, loamy alluvial soils along the near-channel floodplains of perennial desert rivers. This forest intergraded on sites slightly higher above and farther away from the river channels with Mesquite Bosques (61820) before these were cut down for fence posts and fuel.

Characteristic Species: [*Arundo donax*], *Aster spinosus, Atriplex lentiformis, Baccharis salicifolia, B. sarothroides, Phragmites australis, Pleuchea sericea, Populus fremontii macdougallii, Salix exiqua, S. gooddingii gooddingii, Sesbania macrocarpa*, [*Tamarix* spp.]

Distribution: Formerly extensive along the lower Colorado River, but now virtually eliminated by flood control projects, agriculture, or by Tamarisk invasion. In San Diego County: Coyote Canyon.

Sources: 48

61820 Mesquite Bosque

Description: An open to fairly dense, drought-deciduous streamside thorn forest dominated by *Prosopis glandulifera* with open, park-like interiors maintained by frequent flooding or fire. Understories historically were open, dominated by annual and perennial grasses with scattered *Atriplex* species and several lianas.

Site Factors: Washes, streambanks, alkali sinks, or outwash plains with substantial near-surface groundwater supplies. Often occurring on higher alluvial terraces away from perennial streams that support Mojave (61700) or Sonoran Cottonwood-Willow Riparian Forests (61810) closer to the water. Intergrades on drier sites with less reliable water supplies with Desert Dry Wash Woodland (62200).

Characteristic Species: *Amaranthus palmeri, Ambrosia dumosa, Atriplex canescens, A. lentiformis, A. polycarpa, Celtis reticulata, Cercidium floridum, Coldenia palmeri, Cucurbita* spp., *Larrea*

tridentata, Lycium spp., *Prosopis glandulosa, P. pubescens, P. velutina, Sambucus mexicana, Sarcostemma* spp., *Sueda torreyana*

Distribution: Apparently restricted to along the lower Colorado River, never extensive in California and now virtually extirpated by agricultural development, flood control, and Tamarisk invasion. More extensive in Arizona and northwestern mainland Mexico. In San Diego County: north of the Borrego Sink playa, Vallecito Stage Station, Sentenac Cienega.

Sources: 83, 212, 308

62000 Riparian Woodlands

62200 Desert Dry Wash Woodland

Description: An open to dense, drought-deciduous, microphyllous riparian thorn scrub woodland to 30-60 feet tall, dominated by any of several fabaceous trees. In San Diego County, usually dominated by *Olneya tesota, chilopsis linearis, and Cercidium floridum.*

Site Factors: Sandy or gravelly washes and arroyos of the lower Mojave and Colorado deserts, largely in frost-free areas. These washes typically have braided channels that substantially rearranged with every surface flow event.

Characteristic Species: *Baccharis sarothroides, Calliandra eriophylla, Cassia armata, Cercidium floridum, Chilopsis linearis, Condalia globosa, Hoffmannseggia glauca, Hymenoclea monogyra, Lycium andersonii, Olneya tesota, Psorothamnus spinosa, Zizyphus obtusifolia canescens*

Distribution: Along the larger drainages of the lower Mojave and more generally through the Colorado deserts. In san Diego County this occurs throughout the desert areas: Anza Borrego State Park, lower Carrizo Creek, San Felipe Wash, Mason Valley, Coyote Creek

Sources: 1, 48, 62, 308

62300 Desert Fan Palm Oasis Woodland

Description: Open to dense groves dominated by *Washingtonia filifera* to 75-100 feet tall. The understory is sparse in dense groves (where the ground is mulched by fallen fronds) or in more alkaline areas. More open or favorable sites may have a dense understory reminiscent of Mojave or Colorado Riparian Forests (61700, 61800) or Riparian Scrubs (62700, 62800).

Site Factors: Restricted to sites with high water tables in regions with high summer temperatures, mild winters, and little rain. The largest groves are in steep-sided canyons with permanent streams, or adjacent to large springs. Smaller groves occur in canyon bottoms with intermittent surface water, moist canyon sides, or seeps. Oases often have alkaline soils due to high evaporation. Intergrades (often abruptly) with Mojave Riparian Forest (61700), Mojave Mixed Scrub (32400), Desert Dry Wash Woodland (62200), or Sonoran Creosote Bush Scrub (33100).

Characteristic Species: *Adiantum capillus-veneris, Aguilegia shockleyi, Baccharis sergiloides, Celtis reticulata, Cirsium nidulum, Epipactis gigantea, Equisetum laevigatum, Fraxinus velutina, Haplopappus acradenius, Phragmites australis, Platanus racemosa, Pleuchea sericea, Populus fremontii, Prosopis gladulosa, Quercus chrysolepis, Salix exiqua, S. gooddingii, S. lasiolepis, Sambucus mexicana, Sporobolis airoides*, [*Tamarix* spp.], *Typha domingensis, Urtica dioica*

Distribution: Scattered in the canyons of the western edge of the Colorado Desert from near Twentynine Palms south into Baja California, usually below about 3000 feet.

Sources: 1, 48, 62, 221, 224

62400 Southern Sycamore-Alder Riparian Woodland

Description: A tall, open, broadleafed, winter-deciduous streamside woodland dominated by *Platanus racemosa* (and often also *Alnus rhombirolia*). These stands seldom form closed canopy forests, and even may appear as trees scattered in a shrubby thicket of sclerophyllous and deciduous species. Lianas include *Rubus ursinus* and *Toxicodendron diversilobum*.

Site Factors: Very rocky streambeds subject to seasonally high-intensity flooding. *Alnus* increases in abundance on more perennial streams, while *Platanus* favors more intermittent hydrographs.

Characteristic Species: *Acer macrophyllum, Alnus rhombifolla, Artemisia douglasiana, Aralia californica, Equisetum hyemale, Oryzopsis miliacea, Quercus agrifolia, Rubus ursinus, Sambucus mexicana, Toxicodendron diversilobum, Umbellularia californica, Urtica holsoerlcea*

Distribution: Transverse and Peninsular ranges from Point Conception south into Baja California Norte. In San Diego County: Pauma and Pala areas.

Sources: 225

62500 Southern Riparian Woodland #

Description: Moderate-density riparian woodlands dominated by small trees or shrubs, with scattered taller riparian trees.

Site Factors: Major river systems where flood scour occurs and smaller major tributaries.

Characteristic Species: *Baccharis sarothroides, Platanus racemosa, Populus* spp., *Salix* spp., *Sambucus* spp.

Distribution: Throughout San Diego County.

63000 Riparian Scrub

63300 Southern Riparian Scrub

Description: Riparian zones dominated by small trees or shrubs, lacking taller riparian trees. Encroaching into some Coastal Saltmarsh habitats.

Site Factors: Mostly in major river systems where flood scour occurs. Expanded from increased urban and agricultural run-off.

Characteristic Species: *Salix lasiolepis*, *Salix* spp., *Baccharis sarothroides*.

Distribution: Throughout San Diego County.

Sources: 308

63310 Mule Fat Scrub

Description: A depauperate, tall, herbaceous riparian scrub strongly dominated by *Baccharis salicifolia*. This early seral community is maintained by frequent flooding. Absent this, most stands would succeed to cottonwood- or sycamore-dominated riparian forests or woodlands.

Site Factors: Intermittent stream channels with fairly coarse substrate and moderate depth to the water table.

Characteristic Species: *Baccharis salicifolia, Carex barbarae, Salix exigua* (?), *S. hindsiana, S. lasiolepis, Urtica holosericea*

Distribution: Widely scattered along intermittent streams and near larger rivers from about Tehama County south through the Coast Ranges and Sierra Nevada to San Diego and northwestern Baja California Norte, usually below about 2000 feet.

Sources: 217, 228

63320 Southern Willow Scrub

Description: Dense, broadleafed, winter-deciduous riparian thickets dominated by several *Salix* species, with scattered emergent *Populus fremontii* and *Platanus racemosa*. Most stands are too dense to allow much understory development.

Site Factors: Loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. This early seral type requires repeated flooding to prevent succession to Southern Cottonwood-Sycamore Riparian Forest (61330).

Characteristic Species: *Pluchea sericea, Populus fremontii, Salix gooddingii, S. hindsiana, S. lasiolepis S. leucodendroides, S. laevigata, S. lasiandra*

Distribution: Formerly extensive along the major rivers of coastal southern California, but now much reduced by urban expansion, flood control, and channel "improvements".

Sources: 285

63500 Montane Riparian Scrub

Description: Open to dense, broadleafed, winter-deciduous shrubby riparian thickets usually dominated by any of several *Salix* species, *Alnus*, or *Cornus*. This catch-all community includes a bewildering array of cover types that require substantial study.

Site Factors: Relatively fine-textured alluvium along fairly low-gradient reaches of snowmelt fed streams. Often occurs as a thin scrubby corridor through Montane Meadows (45100).

Characteristic Species: *Alnus tenuifolia, Cornus sessilis, C. stolonifera, Lonicera involucrata, Salix anglorum antiplasti, S. caudata, S. drummondiana subcoerulea, S. eastwoodiae, S. geyeriana argentea, S. jepsonii, S. lemmonii, S. liqulifolia, S. lutea, S. lutea watsonii, S. mackenziana, S. melanopsis, S. orestera, S. planifolia monica, S. pseudocordata, S. scouleriana, Spiraea densiflora*

Distribution: Widely scattered above 5000-7000 feet, throughout montane parts of the Klamath, Sierra Nevada, and southern California mountains. Most of these have been ravaged by past livestock grazing and today are threatened by dewatering from small hydro projects.

Sources: 208

63800 Colorado Riparian Scrub

63810 Tamarisk Scrub

Description: A weedy, virtual monoculture of any of several *Tamarix* species, usually supplanting native vegetation following major disturbance.

Site Factors: Sandy or gravelly braided washes or intermittent streams, often in areas where high evaporation increases the stream's saltiness. Tamarisk is a strong phreatophyte and a prolific seeder, attributes which predispose the species to be aggressive competitors in disturbed riparian corridors.

Characteristic Species: *Atriplex lentiformis, Coldenia palmeri, Distichlis spicata, Pleuchea sericea, Salix exiqua,* [*Tamarix chinensis, T. ramosissima*]

Distribution: Widely scattered and increasing its range, throughout the drier parts of California from the rainshadow east of the Inner North Coast Ranges south through the Great Valley to southern California and across the deserts to Nevada, Arizona and beyond.

Sources: 33, 216, 289

63820 Arrowweed Scrub

Description: Moderate to dense streamside thickets strongly dominated by *Pluchea sericea. Typha, Scirpus, Juncus*, and *Distichlis spicata* may occur as scattered individuals, especially around the margins of the thickets.

Site Factors: Streambanks, ditches, and washes with gravelly or sandy channels. This disturbance-maintained community appears to be increasing in extent at the expense of willow, cottonwood, and cottonwood-sycamore riparian forest types as a result of grazing and groundwater pumping.
Characteristic Species: *Distichlis spicata, Juncus* spp.*, Pluchea sericea, Salix exiqua,* [*Tamarix* spp.], *Typha domingensis*
Distribution: In most major drainages in the drier southern parts of California. From the Cuyamaca Valley and Santa Ynez River in Santa Barbara County east to the Amargosa river in Death Valley, Antelope Valley, the Mojave River at least to Barstow, around the Salton Sea, and along the lower Colorado River.
Sources: 289, 290

64000 Unvegetated Habitat * (*# new name, formerly 13000-series*)
Description: Submerged aquatic communities or terrestrial wetlands with minimal vegetative cover (less than 2% cover of herbaceous species and less than 10% cover by tree or shrub species). Structure and composition of the substrate (e.g., stream channel, marine vs. freshwater) is largely determined by the surrounding environment. Usually comprised of open water, rocky outcroppings, sandy beaches, or mudflats.
Distribution: Throughout San Diego County.
Sources: 302

64100 Open Water

64110 Marine Ocean
Description: Marine habitats extend from the upper limit of the unvegetated shore to the ocean.
Characteristic Species: Phytoplankton (diatoms and microalgae) and macroalgae.
Distribution: Along the Pacific Ocean Coast.

64111 Subtidal Ocean
Description: The subtidal zone extends seaward from the low tide line to and including the depth that supports canopy forming kelps given the proper substrate, usually 37 meters (120 feet).
Characteristic Species: Phytoplankton, algae, and canopy forming macroalgaes if there is suitable subtrate in depths up to 37 meters (120 feet). One species of flowering plant, surf grass (*Phyllospadix scouleri*) occurs in the subtidal and intertidal zone.
Distribution: Along the Pacific Ocean Coast.
Sources: 303

64112 Intertidal Ocean

Description: The intertidal zone includes the area exposed by low tide up to and including the spray zone.

Characteristic Species: Algae and *Phyllospadix scouleri*, although often unvegetated.

Distribution: Rocky zones periodically submerged by water depending on the tides along the Pacific Ocean Coast.

64120 Marine Bay

64121 Deep Bay

Description: Any body of water surrounded by land on three sides that is greater than 20 feet in depth

Source: 306

64122 Intermediate Bay

Description: A bay with a depth between 4-20 feet

Source: 306

64123 Shallow Bay

Description: A bay less than 4 feet deep where light penetrates to the sea floor.

Characteristic Species: *Zostera marina*, but often unvegetated.

Source: 306

64130 Estuarine

Description: Estuarine habitats occur on periodically and permanently flooded substrates and open water portions of semi-enclosed coastal waters where tidal seawater is diluted by flowing fresh water. Salinity and depth varies dramatically in estuarine habitats, resulting in high species richness but low diversity of phyla.

Characteristic Species: Phytoplankton.

Distribution: Estuarine habitats commonly occur along the San Diego County at the drowned mouths of perennial rivers tributary to the Pacific Ocean.

Sources: 304

64131 Subtidal Estuary

Description: Characterized by continuous water coverage.

Characteristic Species: Phytoplankton, eel grass (*Zostera marina*)

Distribution: Inner part of estuarine habitats.

64132 Intertidal Estuary

Description: In the intertidal zone, the substrate is periodically exposed and flooded by tidal action or at times by storm

runoff. Shoreline is defined by a water border with less than 2 percent existing as Saline Emergent Wetland.
Characteristic Species: Phytoplankton
Distribution: Outer edges of estuarine habitats.

64133 Brackishwater Estuary
Description: Water in the estuarine habitat that contains more sea salts than freshwater but less than the open ocean. Salinity fluctuates based on rainfall, evaporation, and tides, although brackish marshes are exposed to limited tidal action.
Characteristic Species: Algae, eel grass (*Zostera marina*).
Distribution: Throughout estuarine habitats.

64140 Fresh Water
Description: This is comprised of year-round bodies of fresh water (extremely low salinity) in the form of lakes, streams, ponds or rivers. This includes those portions of water bodies that are usually covered by water and contain less than 10% vegetative cover.

64200 Non-Vegetated Floodplain or Channel
Description: The sandy, gravelly, or rocky fringe of waterways or flood channels. Unvegetated on a relatively permanent basis. Variable water lines inhibit the growth of vegetation, although some weedy species of grasses may grow along the outer edges of the wash. Vegetation may exist here but is usually less than 10% total cover. Not appropriate when sand or alluvium is an artifact of a very recent or uncommon flood event in the upper parts of watersheds.
Site Factors: Lower parts of cismontane rivers and in desert washes, especially in the driest parts of the badlands.
Distribution: San Diego, Tijuana, San Luis Rey and Santa Margarita Rivers. Also in major desert washes.
Sources: 308

64300 Saltpan/Mudflats
Description: Mudflats are coastal wetlands that form when mud is deposited by the tides or rivers. They are commonly found in sheltered areas such as bays and estuaries. For a majority of the time, saltpans are expanses of ground covered in salt or other minerals formed from evaporated water. Saltpans generally pool water when it rains, forming mudflats.

64400 Beach
Description: Sandy and/or cobbly habitat on coastal strands, lagoons or lakes. Ocean beaches are a shoreline feature of deposited sand formed by waves and tides off the coast. Beaches on lakes may be a result of waves,

disturbance, or geological formations. These are mainly unvegetated areas; however, upper portions may be thinly populated with herbaceous species.

Characteristic Species: In oceans: seagrasses from Posidoniaceae, Zosteraceae, Hydrocharitaceae and Cymodoceaceae. Other areas vary widely.

65000 Non-Native Riparian #

Description: Densely vegetated riparian thickets dominated by non-native, invasive species. This designation should only be used where non-native, invasive species account for greater than 50% of the total vegetative cover within a mapping unit. If dominated by *Tamarix* spp., see also Tamarisk Scrub (63810).

Site Factors: Found in a variety of wetland habitats, often where disturbance has occurred.

Characteristic Species: [*Arundo donax*], [*Tamarix* spp.], [*Eucalyptus* spp.], [*Phoenix* spp.], [*Washingtonia* spp.], [*Cynodon dactylon*], [*Ricinus communis*], [*Cortaderia* spp.] along with natives such as *Pluchea sericea, Populus fremontii, Salix* spp.

Distribution: Extensive along the major rivers of coastal southern California. In San Diego County this is common in major river channels such as Otay River, Sweetwater River, San Diego River, San Dieguito River, San Luis Rey River.

65100 Arundo-Dominated Riparian #

Description: Densely vegetated riparian thickets dominated almost exclusively by giant reed (*Arundo donax*). This designation should only be used where *Arundo* accounts for greater than 50% of the total vegetative cover within a mapping unit.

Site Factors: Loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows.

Characteristic Species: [*Arundo donax*].

Distribution: Extensive along the major rivers of coastal southern California. In San Diego County this is common in major river channels such as Otay River, Sweetwater River, San Diego River, San Dieguito River, San Luis Rey River.

70000 Woodland

These communities have an open canopy of trees, whereas forests have a more closed canopy.

71000 Cismontane Woodland

71100 Oak Woodland

71120 Black Oak Woodland

Description: Open to dense woodlands are dominated by *Quercus kelloggii* (approximately 50% or more of the tree canopy cover). Shruby understories usually are partly open, often with *Cercocarpus betuloides*. *Pinus ponderosa* is a common associate on all but the poorest sites. Most stands are even-aged and

younger than 125 years. Ground cover usually is well developed, contributing to a good litter layer.

Site Factors: Mainly a seral community maintained by fire. *Quercus kelloggii* is a vigorous stump sprouter. Stands younger than about 60 years are not very resistant to fire. Stands that have been overtopped by taller conifers may decline because *Q. kelloggii* is very shade-in tolerant. Best developed between 1500 ft and 3000 ft, in areas receiving 30-50 inches of rain (to 7000 in southern California). San Diego County is the southern end of the range for this woodland type.

Characteristic Species: *Arbutus menziesii, Abies concolor, Calocedrus decurrens, Lithocarpus densiflorus, Pinus jeffreyi, Pinus attenuata, P. coulteri* (in south), *P. ponderosa, Pseudotsuga macrocarpa* (in south), *P. menziesii, Quercus chrysolepis* (poor sites), *Q. garryana, Q. kelloggii, Q. wizlizenii,Q. douglasii, Pterideum aquilinum, Umbellularia californica, Aesculus californicus, Ceanothus intergerrimus, Arctostaphylos viscida, Rhamnus crocea, Lonicera interupta, Cercis occidentalis, Cercocarpus betuloides, Toxicodendron diversiloba.*

Distribution: Discontinuously scattered from the central Oregon Cascades south through the mountains to near the Mexican border. Best developed in the southern Cascades and Klamath mountains and northern parts of the Coast Ranges and Sierra Nevada, especially between 2500 and 5000 feet. In San Diego County: Cuyamaca and Mesa Grande.

Sources: 12, 13, 27, 68, 150, 155, 308

71160 Coast Live Oak Woodland

Description: This woodland is dominated by *Quercus agrifolia, an* evergreen oak that reaches 10-25 m in height. The shrub layer is poorly developed, but may include *Heteromeles arbutifolia, Ribes* spp., *Malosma laurina*, or dominated *Sambucus mexicana*. The herb component is continuous and dominated by [*Bromus diandrus*] and several other introduced taxa.

Site Factors: Typically on north-facing slopes and shaded ravines in the south and more exposed sites in the north. Intergrades with Coastal Scrub (32000) and Upper Sonoran Mixed Chaparral (37100) on drier sites and with Coast Live Oak Forest (81310) or Mixed Evergreen Forest (81100) on moister sites.

Characteristic Species: *Aesculus californica, Sanicula laciniata, Heteromeles arbutifolia, Quercus agrifolia, Rhamnus californica, Sambucus mexicana, Toxicodendron diversilobum, Diplacus aurantiacus, Lathyrus vestitus, Artemisia californica, Arbutus menziesii, Umbellularia californica, Ribes* spp. [*Bromus diandrus*] [*Stellaria media*], [*Galium aparine*], [*Cirsium vulgare*], *Toris nodosa*

Distribution: Outer South Coast Ranges, and coastal slopes of Transverse and Peninsular ranges, usually below 4000 ft (1220 m). Intergrades with Blue Oak Woodland (71120) in the inner South Coast Ranges and with Englemann Oak Woodland (71180) in interior southern California.
Sources: 1, 27, 73, 104, 139, 171, 225

71161 Open Coast Live Oak Woodland *

Description: Generally similar to the Coast Live Oak Woodland (71160) but with a canopy cover less than 50%. *Quercus agrifolia* present to a limited extent, but often co-dominant with other riparian, chaparral, or woodland types. This is a subtype occurring on the ecological margin of denser woodlands.
Site Factors: Along drainages at desert margin on north-facing slopes or mixed with *Quercus engelmannii*.
Sources: 308

71162 Dense Coast Live Oak Woodland *

Description: Generally similar to the Coast Live Oak Woodland (71160) but with a canopy cover between 50% and 75%. This resembles our riparian woodlands more closely than Coast Live Oak Forest (81310).
Site Factors: Mostly occurs at the narrowing of valley flood plains. Valleys with deep alluvium and high perennial groundwater, mostly in riparian habitats.
Distribution: Throughout the foothill and mountain regions of San Diego County.
Sources: 308

71180 Engelmann Oak Woodland

71181 Open Engelmann Oak Woodland

Description: An evergreen woodland dominated by *Quercus engelmannii* with an understory of typical "grassland" species, Inland Sage Scrub (32520), Valley “Stipa” Grassland, Chaparral or combined with *Q. agrifolia* at mesic sites.
Site Factors: Relatively moist sites on fine-textured soils of gentle slopes and valley bottoms. Intergrades with Venturan (32300) or Riversidian (32700) Sage Scrubs on drier, rockier sites, and with Dense Engelmann Oak Woodland (71182) on more mesic sites. Often surrounds grassland potreros, occupying the ecotone between the grassland (on

fine-textured, deep soils) and surrounding shrub fields (on rockier, drier sites).

Characteristic Species: *Quercus engelmannii, Juglans californica, Quercus agrifolia, Rhus ovata, R. trilobata*

Distribution: Mainly in the Santa Ana Mountains of San Diego and adjacent Riverside counties, usually below about 4000 ft. Same distribution as the Engenmann Oak itself with a density phase as a function of local soil and hydrology, not climate driven.

Sources: 9, 11, 14

71182 Dense Engelmann Oak Woodland

Description: Very similar to Open Englemann Oak Woodland (71181), but has *Quercus agrifolia* as an additional significant constituent. Canopy cover is very similar to that observed in Open Englemann Oak Woodland, but stem densities are much greater due to *Q. agrifolia* being superimposed on the *Q. engelmannii*. In San Diego County, it is less associated with scrub types than the open phase.

Site Factors: On slightly more mesic sites (especially in steep canyons) than Open Englemann Oak Woodland (71181). Intergrades also with Coast Live Oak Woodland (71160) at slightly higher elevations on even more mesic sites.

Characteristic Species: *Quercus agrifolia, Q. engelmannii, Toxicodendron diversilobum*

Distribution: Mainly in the Santa Ana and other Peninsular ranges. Throughout the range of Engelmann oaks.

Sources: 9, 11, 14, 27, 137, 139, 308

71200 Walnut Woodland

Description: Similar to and intergrading with Interior Live Oak. Woodland (71150) or Coast Live Oak Woodland (71160), but with a more open tree canopy locally dominated by *Juglans californica*. The open tree canopy allows development of a grassy understory. In most sites, this understory is comprised of introduced winter-active annuals that complete most of their growth cycle before the deciduous *Juglans* leafs out in spring.

Site Factors: On relatively moist, fine-textured soils of valley slopes and bottoms, as well as encircling rocky outcrops. These drier, rocky sites often support Venturan (32300) or Riversidian Sage Scrub (32700). Intergrades with Coast Live Oak Woodland (71160) or Coast Live Oak Forest (31310) on more mesic sites, especially in canyons.

Characteristic Species: *Juglans californica, Quercus agrifolia, Q. engelmannii, Rhus ovata, R. trilobata,* [*Bromusmadriatensis* ssp. *rubens*], [*Marrubium vulgare*]

Distribution: South side of San Gabriel Mountains to the Santa Ana Mountains, mostly between 500 ft and 3000 ft.
Sources: 1, 11, 27

72000 Pinon and Juniper Woodlands

72300 Peninsular Pinon and Juniper Woodlands

Description: Though two piñon pines (Pinus monophylla and P. quadrifolia) and California juniper do occur separately, they overlap in San Diego County and are merged. Merges with Semi-desert Chaparral (37400).
Site Factors: *Pinus quadrifolia* is only known at high elevations at McCain Valley (unconfirmed), Desert View Point, Stephenons Peak, Monument Peak and Mountain Springs. Juniper woodland is more widely distributed downslope (i.e., near Banner).
Characteristic Species: *Juniperus californica, Pinus monophylla, P. quadrifolia,* along with *Yucca schidegera, Quercus Cornelius-mulleri, Nolina parryi* at higher elevations.
Sources: 308

72310 Peninsular Pinon Woodland

Description: A relatively dense Pinon Woodland, locally dominated by *Pinus quadrifolia* rather than *P. monophylla*. Typical stands have scattered or clumped individuals emergent through relatively dense chaparral.
Site Factors: Similar to but more mesic than Mojavean pinon Woodland (72220), with which it intergrades near its lower eastern (desert) margins; intergrades with Upper Sonoran Mixed, chamise, or Red shank chaparrals (37100-37300) along its lower western margin; also intergrades with Montane Coniferous Forests (84000) near its upper margin.
Characteristic Species: *Adenostoma fasciculatum, A. sparsifolium, Juniperus californica, Pinus quadrifolia, Pinus jeffreyi, Cercocarpus ledifolius*.
Distribution: A conspicuous component of west-facing drainages in the desert transition from the San Jacinto Mountains south into northern Baja California.
Sources: 1, 21, 48, 68

72320 Peninsular Juniper Woodland and Scrub

Description: Very similar to Peninsular Pinon Woodland (72310), but with *Juniperus californica* conspicuous or even dominating xeric sites directly beneath the tree driplines.
Site Factors: Alluvial fans and desert slopes, slightly lower and more xeric than the Peninsular Pinon Woodland with which it intergrades. Fuel loads usually are insufficient to carry a fire. The woodland

species do not tolerate fire: burning this type usually leads to semi-desert chaparral (37400).

Characteristic Species: *Juniperus californica, Nolina parryi, Pinus quadrifolia, Quercus turbinella, Yucca schidigera, Artemisia tridentata.*

Distribution: San Jacinto and Santa Rosa Mountains in Riverside County, Laguna Mountains and micro locations (such as in De Luz) in southern San Diego County, southward into Baja California. Elevation mostly between 3500 ft and 5500 ft (1070m and 1680m).

Sources: 1, 21, 68

75000 Sonoran Thorn Woodland

75100 Elephant Tree Woodland *

Description: San Diego County is on the northern end of the range for Elephant trees found in the Sonoran Desert. It intergrades with Sonoran Desert Scrub. Ususally on south-facing slopes.

Characteristic species: Dominated by *Bursera microphylla*.

Distribution: In San Diego County found on desert slopes.

Source: 306

77000 Mixed Oak Woodland *

Description: Dominated by oaks. Often yields to pine-dominated types.

Site Factors: At high elevations where several oak tree species share dominance.

Characteristic Species: *Quercus agrifolia, Q. chrysolepis, Q. kelloggii, Q. engelmannii.*

Distribution: In San Diego County found on the north end of Guejito Ranch, Mesa Grande, Wynola, North Peak, and Julian.

Source: 306, 308

78000 Undifferentiated Open Woodland *

Description: Catch-all category when species composition is unknown but the structural characteristics of the vegetation is known. Canopy is fairly open.

Characteristic Species: *Quercus* spp., etc.

Source: 306

79000 Non-Native Woodland #

Description: Woodland of exotic trees, usually intentionally planted, which are not maintained or artificially irrigated. Does not usually apply where these trees have naturalized or in riparian woodlands.

Characteristic Species: Usually *Eucalyptus* spp. or *Tamarix* spp., but other non-native species may occur.

Source: 308

79100 Eucalyptus Woodland * (# *formerly 11100*)

Description: Eucalyptus habitats range from single-species thickets with little or no shrubby understory to scattered trees over a well-developed herbaceous

and shrubby understory. In most cases, eucalyptus forms a dense stand with a closed canopy. Eucalyptus species produces a large amount of leaf and bark litter, the chemical and physical characteristics of which limit the ability of other species to grow in the understory, decreasing floristic diversity. Overstory composition is typically limited to one species of the genus, or mixed stands composed of several *Eucalyptus* species; few native overstory species are present within eucalyptus planted areas, except in small cleared pockets.

Characteristic Species: [*Eucalyptus* spp.] including the most common [*E. globulus* (blue gum)] and [*E. camaldulensis* (red gum)] species.

Distribution: In San Diego County; Coastal and foothill regions with significant access to water stores.

Sources: 300, 301

80000 Forest

These communities have closed, or nearly-closed, canopy of trees.

81000 Broadleaved Upland Forest

81100 Mixed Evergreen Forest

Description: Dominated by broad leaved trees, 10-30m tall, often with taller conifers interspersed, forming a closed forest. Most species are sclerophyllous evergreens, but winter-deciduous species also occur. Relatively little understory grows under the dense canopy. Often occurs in small, mosaic-like patches, surrounded by grassland on heavier soils. Most species are relatively inactive during the winter; growth increases rapidly in spring and continues at a reduced rate into summer.

Site Factors: On moist, well-drained, coarse soils, usually on slopes. Often around rock outcrops on heavier soils. Intergrades with Californian Mixed Chaparral (37110) on drier, rockier slopes; with Coast Live Oak Forest (81301) on drier, interior slopes; with Northern Oak Woodland (71100), or Valley and Foothill Grassland (42000) on drier, fine- textured soils; with Douglas Fir Forest (82400) or Redwood Forest (82300) on moister slopes or canyon bottoms and with Coast Range. Coniferous Forests (84100) at higher elevations. Geographically and biologically transitional between the dense coniferous forests of northwestern California and the open woodlands and savannas of the interior. Each of the dominant species, except *Arbutus menziesii*, is well-represented in one or more of these other habitat types.

Characteristic Species: *Acer macrphyllum, Arbutus menziesii, Chrysolepis chrysophylla, Lithocarpus densiflorus, Pseudotsuga menziesii, Quercus chrysolipis, Quercus kelloggii, Umbellularia californica*

Distribution: More or less continuous from Santa Cruz Co. northward through the outer coast ranges into Oregon, usually away from the immediate coast. Typically follows the upper and/or inland margins of the coastal Redwood Forest (82300) or Douglas Fir Forest (82400). Also on north-facing slopes

of the inner north coast ranges, the Santa Lucia Mtns., and with small outliers extending to Santa Barbara Co. Elevations ranging from 200-3000 ft (60-910 m) in the north to 1000-4000 ft (300-1210 m) in the south including Palomar Mountain in San Diego County.

Sources: 1, 8, 26

81300 Oak Forest

81310 Coast Live Oak Forest

Description: Similar to Mixed Evergreen Forest (81100) and Coast Live Oak Woodland (71160), not quite so dense and with fewer tree species than the former; more dense than the latter, forming a forest instead of a woodland. Dominated by *Quercus agrifolia*, a broad-crowned, sclerophyllous evergreen tree up to 25 m tall. The growing season may begin earlier than in Mixed Evergreen Forest, at least in the southern coastal locations, whereas a greater reduction of growth probably occurs during the summer-fall drought. In San Diego County, this vegetation community may not occur as an upland community and may be better classified as Southern Coast Live Oak Riparian Woodland (61310).

Site Factors: Similar to Mixed Evergreen Forest (81100) and Coastal Live Oak Woodland (71160), but drier than the former and moister than the latter. May intergrade with these locally as well as regionally. May occur in valley bottoms as well as on slopes.

Characteristic Species: *Arbutus menziesii, Pinus coulteri, Quercus agrifolia, Toxicodendron diversilobum, Umbellularia californica*

Distribution: Coast ranges from Sonoma Co. to Santa Barbara Co. Most common away from the coast in the north and near the coast in the south. Often adjacent to Mixed Evergreen Forest (81100) in the north or merging with Coast Live Oak Woodland (71160) in the south. Elevation usually below 3000 ft (1000 m).

Sources: 1

81320 Canyon Live Oak Forest

Description: Similar to Coast Live Oak Forest (81310), but usually denser and not so tall. Dominated by *Quercus chrysolepis*, a broadleaved sclerophyll. Typically forms forests with little understory up to 20 m tall in canyons or on north-facing slopes, and low, chaparral-like stands less than 10 m tall on south-facing slopes. Trees often with multiple trunks, probably from crown-sprouting after fires. Growing season from late spring into summer, similar to that of Lower Montane Coniferous Forests (84000).

Site Factors: Transitional between low elevation broadleaved forests and higher elevation coniferous forests. On rocky, often steep slopes with little soil development. Typically in canyons and on north-facing slopes at relatively low elevations and on south-facing

slopes at higher elevations. At higher elevations with colder winters than Mixed Evergreen Forest (81100), Blue Oak Woodland (71210), Coast Live Oak Forest or Californian Mixed Chaparral (37110). Often adjacent to Montane Chaparral (37500) on dry slopes or lower Montane Coniferous Forest (84000) on less rocky soils. May intergrade with any of the above vegetation types and is not always distinct from them.

Characteristic Species: *Calocedrus decurrens, Lithocarpus densiflorus, Pinus coulteri* (South Coast Ranges), *Pseudotsuga menziesii, Quercus chrysolepis, Umbellularia californica*

Distribution: Inner North Coast Ranges from Siskiyou Co. to Lake Co., South Coast Ranges from Mount Diablo to Monterey Co. West slope of the Sierra Nevada from Tehama Co. to Kern Co. at elevations of 1000 to 4000 ft in the north and 3000 to 6000 ft in the south. Replaced by the closely related Bigcone Spruce-Canon Oak Forest (84150) in the Transverse and Peninsular Ranges of southern California. May be represented in San Diego County in some form but apparently is intended for more northern areas.

Sources: 1

81340 Black Oak Forest

Description: A persistent subclimax forest dominated by *Quercus kelloggii*, scattered emergent *Pinus ponderosa* (except in poorest sites). Most stands are even-aged, reflecting past disturbances.

Site Factors: An obvious fire type, *Quercus kelloggii* requires disturbance to hold its own outside its core zone. Occurs on mountain slopes, benches and coves, canyon bottoms, lower sidehills and upper foothill slopes

Characteristic Species: *Abies concolor, Aesculus californicus, Arbutus menziesii, Calocedrus decurrens, Lithocarpus densiflorus, Pinus attenuata, P. coulteri* (southern California only), *P. jeffreyi, P. lambertiana, P. ponderosa, Pseudotsuga macrocarpa* (southern California only), *P. menziesii, Quercus chrysolepis, Q. garryana, Q. kelloggii, Umbellularia californica*

Distribution: Best developed and most extensive in southern Cascade and Klamath Mountains and in northern parts of the Coast Ranges and Sierra Nevada, mostly between 1500-3000 ft. Found elsewhere in the Sierra Nevada, South Coast, and Transverse Ranges as low as 200 and as high as 8000 ft. Represents apparent patches of oak in the midst of coniferous forests.

Sources: 12, 28

83000 Closed-cone Coniferous Forest

83100 Coastal Closed-cone Coniferous Forest

83140 Torrey Pine Forest

Description: Open to moderately dense forest up to 20 m tall in sheltered localities, becoming much shorter and wind-pruned in exposed situations. Dominated by *Pinus torreyana*. The understory varies from almost nothing on the driest, rockiest sites to fairly dense, chaparral on generally rocky soil to an open mixture of grasses and shrubs on better-developed soils. With a dense tree canopy, needles accumulate on the ground, and again, few understory plants occur. The first two conditions are more prevalent at Del Mar, the other two on Santa Rosa Island. Most growth and flowering occur in late winter and spring, with some activity in other months, at least in mesic sites.

Site Factors: Occurs on rocky sandstone soil in areas of mild, essentially frost-free climate, with low precipitation. Fogs may occur at any time of year but are less common in winter and late spring. Intergrades with Southern Coastal Bluff Scrub (31200) and Southern Mixed Chaparral (37120) (Del Mar); with Island Chaparral (37700) and Valley and Foothill Grasslands (42000) (Santa Rosa Island).

Characteristic Species: *Adenostoma fasciculatum, Arctostaphylos glandulosa crassifolia, Artemisia californica, Baccharis salicifolia, Cneoridium dumosum. Coreopsis gigantea, C. maritima, Dendromecon rigida, Encelia californica, Haplopappus squarrosus, Heteromeles arbutifolia, Pinus torreyana, Quercus dumosa, Rhus integrifolia, Malosma laurina, Salvia apiana, S. mellifera, Xylococcus bicolor*

Distribution: There are two small natural stands: the larger on the coast of San Diego County in the vicinity of Del Mar and Torrey Pines State Reserve; the smaller on the northeastern side of Santa Rosa Island.

Sources: 1, 32

83200 Interior Closed-cone Coniferous Forest

83230 Southern Interior Cypress Forest

Description: A fairly dense, fire-maintained, low forest dominated by either *Cupressus nevadensis, C. forbesii*, or *C. stephensonii*. This forest often occurs as isolated groves within a matrix of Chaparral or Pinon-Juniper Woodland. Many stands are even-aged due to fire density, and spacing within the stands vary in relation to site factors and fire history. In San Diego County, this includes stands of *Cupressus forbesii* (*=C. guadalupensis* ssp. *f.*) and *Cupressus arizonica* ssp. *arizonica* (*=C. a*. ssp. *stephensonii)*.

Site Factors: Similar to but in a drier climate than Northern Interior Cypress Forests (83220), but not usually associated with ultramafic substrates. Most often found on northern exposures.

Characteristic Species: *Adenostoma faciculatum, Arctostaphylos glandulosa, Cercocarpus betuloides, Cupressus forbesii, C. nevadensis, C. stephensonii, Eriogonum faciculatum, Heteromeles arbutifolia, Juniperus californica, Pinus coulteri, P. monophylla*

Distribution: Southern Sierra Nevada (Kern River watershed, *C. nevadensis*) and Peninsular Ranges south into Baja California. Elevations vary with species: 1000-4500 ft for *C. forbesii*, ~5500 ft for *C. stephensonii*, and 4000-6000 ft for *C. nevadensis*. In San Diego County: slopes of Palomar Mtn., Otay Mtn., Guatay Mtn., and Cuyamaca Peak.

Sources: 1, 11, 32, 34, 308

84000 Lower Montane Coniferous Forest

84100 Coast Range, Klamath and Peninsular Coniferous Forest*

84140 Coulter Pine Forest

Description: An open forest (or more accurately, woodland) of scattered *Pinus coulteri* and *Quercus kelloggii* over shrubs typically associated with Upper Sonoran Mixed Chaparral (37100). Some stands are dense enough to supress the shrubby layer. Most growth occurs in spring and early summer.

Site Factors: Typically on dry, rocky soils of slopes and ridges. Most frequent on south-facing slopes, frequently intermixing there with Californian Mixed Chaparral (371100) or Lower Montane Chaparral (37510). Subject to fairly frequent fires on these sites. In the Coast Ranges intergrades with Coast Range Mixed Conifer Forest (84110), Coast Range Ponderosa Pine Forest (84130), or Mixed Evergreen Forest (81100) on moist sites; Blue Oak Woodland on low-elevation, dry sites; Knobcone Pine Forest (83210) on dry, sterile soils. In southern California, frequently merges into Sierran Mixed Conifer Forest (84230) at its upper limits. Fire exclusion may be facilitating conversion of some oak woodlands to Coulter pine stands, as in the Gabilan Range.

Characteristic Species: *Abies bracteata, Arctostaphylos glandulosa, A. pringlei* ssp. *drupacea, A. pungens, Ceanothus integerrimus, Cercocarpus betuloides, Pinus coulteri, P. ponderosa, P. sabiniana, Pseudotsuga macrocarpa, Quercus agrifolia, Q. chrysolepis, Q. kelloggii*

Distribution: Widely scattered, though fragmented, throughout the South Coast Ranges from Contra Costa County south into Baja California. Elevations vary from 2500-5000 ft in the north, to 4000-6500 ft in the south. Best developed in San Gabriel, San Bernardino, and San Jacinto mountains.

Sources: 1, 27, 36, 40

84150 Bigcone Spruce (Bigcone Douglas Fir)-Canyon Oak Forest

Description: An open (on steep slopes) to dense (on flats) forest dominated by *Pseudotsuga macrocarpa* 50-80 ft tall over a dense subcanopy of *Quercus chrysolepis* and a very sparce herb layer. Most stands are fairly small within a chaparral matrix.

Site Factors: Largely on rocky sites with little soil development. Restricted to mesic exposures and canyon sides at low elevations (~1000 ft), but on warmer aspects at upper altitudinal limit (~8000 ft). Fires appear to be frequent, though perhaps less intense than in surrounding chaparrals. Mature *Pseudotsuga* is capable of trunk-sprouting after fire. Intergrades in canyon bottoms Southern Riparian Forest (62130), with Upper Sonoran Mixed Chaparral (37100) on more xeric sites, and with Coulter Pine Forest (84140) or Sierran Mixed Conifer Forest (84200) at higher elevations.

Characteristic Species: *Acer macrophyllum, Calocedrus decurrens, Cercocarpus betuloides, Pseudotsuga macrocarpa, Quercus agrifolia, Q. chrysolepis, Ribes californicum, Toxicodendron diversilobum, Umbellularia californica, Vitis girdiana*

Distribution: Transverse and Peninsular Ranges from the Mt. Pinos region south to near Banner in San Diego County, mostly on coastal (rather than desert-facing) slopes.

Sources: 1, 6, 11, 36

84200 Sierran Coniferous Forest

84230 Sierran Mixed Coniferous Forest

Description: Similar to "Westside" Ponderosa Pine Forest (84210), but denser, with the crowns often touching, often slightly taller (to 75 m) and with several dominant species. *Abies, Pseudotsuga* and *Cornus* are more common on moist sites; *Pinus* spp. and *Ceanothus* spp. on dry sites. *Pseudotsuga* is lacking south of northern Fresno Co. Understory much as in "Westside" Ponderosa Pine Forest but with scattered, broadleaved mesophytic shrubs and small tress, and with greater accumulation of wood on the ground. The growing period is similar to that in "Westside" Ponderosa Pine Forest, concentrated in early summer. In San Diego County, this type is usually typified by *Calocedrus decurrens*, *Abies concolor*, and *Pinus* spp.

Site Factors: Similar to "Westside" Ponderosa Pine Forest (84210), but usually on moister soils. Usually on north-facing slopes near its lower elevational margin in areas of greater winter snowpack than "Westside Ponderosa Pine Forest, "Eastside" Ponderosa Pine Forest (84220), Lower Montane Chaparral (37500) or Upper Montane Chaparral (37520). Intergrades with Sierran White Fir Forest (84240) on cool, moist, north-facing slopes within its

elevational range. At its upper limit, intergrades with Upper Montane Mixed Conifer Forest (85200) on direr slopes or with Upper Montane Fir Forest (85300) on moist, north-facing slopes.

Characteristic Species: *Abies concolor, Artostaphylos patula, Calocedrus decurrens, Chrysolepis sempervirens , Ceanothus cordulatus, C. integerrimus, C. prostratus, Cornus nuttallii, Pinus jeffreyi, P. lambertiana, P. ponderosa, Prunus emarginata, Pseudotsuga menziesii, Quercus kelloggii, Ribes roezlii, R. nevadensis, Ribes* spp.*, Sequoiadendron gigantea*

Distribution: Very similar to "Westside" Ponderosa Pine Forest (84210), but ranging, in addition, to the east side of the Sierra Nevada-Cascade crest on moist slopes from southeastern Siskiyou Co. to the Lake Tahoe region. Elevation from 3000-6000 ft (900-1800 m) in the north to 5000-7000 ft (1500-2100 m) in the south, averaging slightly higher than "Westside" Ponderosa Pine Forest. Also present on the summit plateau of the Sierra San Pedro Martir, Baja, California between 7000 and 8000 ft (2100-2400 m). In San Diego County: Cuyamaca Rancho State Park.

Sources: 1, 42, 43

84500 Mixed Oak/Coniferous/Bigcone/Coulter Forest*

Description: Forested community with a diversity of oak and conifer species.

Characteristic Species: *Abies concolor, Calocedrus decurrens, Pinus jeffreyi, P. ponderosa, Pseudotsuga macrocarpa, Quercus agrifolia,Q. kelloggii, Q. chrysolepis*

Distribution: In San Diego County: Palomar Mountain.

85000 Upper Montane Coniferous Forest

85100 Jeffrey Pine Forest

Description: A tall, open forest dominated by *Pinus jeffreyi*, with sparse understories of species drawn from Montane Chaparral (37500) or Sagescrub Scrub (35200). Very similar in aspect to Ponderosa Pine Forest (84210, 84220). Pure stands are best developed on desert-facing slopes.

Site Factors: Dry, cold sites, especially on well-drained slopes, ridges, or cold air accumulation basins. West of the Sierran crest, it intergrades at its lower elevational limit (5000-6500 ft) with Montane Chaparral (37500), Coulter Pine Forest (84140) or Westside Ponderosa Pine Forest (84210). East of the crest it passes to Pinon-Juniper Woodlands (72000), Great Basin Scrub (35000) or Eastside Ponderosa Pine Forest (34220). Passes in more mesic sites or higher elevations (7000-9000 ft) into Upper Montane Mixed Conifer Forest (85200) or Subalpine Forest (86000).

Characteristic Species: *Artemisia tridentata, Chrysolepsis sempervirens, Pinus jeffreyi, Purshia tridentata, Quercus vaccinifolia, Symphoricarpus parishii, Ceanothus prostratus, C. velutinus, C. cordulatus, Arctostaphylos patula, Cercocarpus ledifolius, Arctostaphylos nevadensis*

Distribution: Similar to Sierran Mixed Conifer Forest (84230) but typically at higher elevation and more extensive toward the south and east. Scattered through the higher North Coast Ranges and Klamath Mtns. Abundant from Shasta and Lassen Cos. southward through the Sierra Nevada to Kern Co. Best developed on the east side of the central Sierra Nevada, especially south of Mono Lake. Relatively abundant in the higher portions of the Transverse and Peninsular Ranges of southern California and Baja California, including the Mt. Pinos region, the eastern San Gabriel Mtns., San Bernardino Mtns., San Jacinto Mtns., Cuyamaca-Laguna Mtns., and the Sierra San Pedro Martir. Elevation usually 5500-7500 ft (1650-2700 m) in the north and 6500-9000 ft (2000-2700 m) in the south. Stands at lower elevations probably are on ultramafic substrates.

Sources: 1, 11, 45

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List of vegetation communities found in San Diego County

* Denotes additions to Holland's original categories by Thomas Oberbauer (February 1996)
# Denotes additions to Holland's original categories in this publication.

10000 DISTURBED OR DEVELOPED AREAS *
- 11000 Non-Native Vegetation
  - 11200 Disturbed Wetland
  - 11300 Disturbed Habitat
- 12000 Urban/Developed
- 18000 General Agriculture
  - 18100 Orchards and Vineyards
  - 18200 Intensive Agriculture - Dairies, Nurseries, Chicken Ranches
  - 18300 Extensive Agriculture - Field/Pasture, Row Crops
    - 18310 Field/Pasture
    - 18320 Row Crops

20000 DUNE COMMUNITY
- 21000 Coastal Dunes
  - 21100 Active Coastal Dunes
  - 21200 Foredunes
  - 21230 Southern Foredunes
- 22000 Desert Dunes
  - 22100 Active Desert Dunes
  - 22300 Stabilized and Partially-Stabilized Desert Sand Field
- 23000 Interior Dunes
  - 23200 Relictual Interior Dunes
- 24000 Stabilized Alkaline Dunes*
- 25000 Badlands/Mudhill Forbs* *(# was 46100)*

30000 SCRUB AND CHAPARRAL
- 31000 Coastal Bluff Scrub
  - 31200 Southern Coastal Bluff Scrub
- 32000 Coastal Scrub
  - 32400 Maritime Succulent Scrub
  - 32500 Diegan Coastal Sage Scrub
    - 32510 Diegan Coastal Sage Scrub: Coastal form*
    - 32520 Diegan Coastal Sage Scrub: Inland form*
    - 32530 Diegan Coastal Sage Scrub: Bacchars-dominated #
  - 32700 Riversidian Sage Scrub
    - 32710 Riversidian Upland Sage Scrub
    - 32720 Alluvial Fan Scrub
  - 32800 Flat-topped Buckwheat* (*formerly part of 37K00*)
- 33000 Sonoran Desert Scrub
  - 33100 Sonoran Creosote Bush Scrub
  - 33200 Sonoran Desert Mixed Scrub
    - 33210 Sonoran Mixed Woody Scrub
    - 33220 Sonoran Mixed Woody and Succulent Scrub

33230 Sonoran Wash Scrub*
33500 Calcicolous Scrub*
33600 Encelia Scrub*
33700 Acacia Scrub* (*formerly 29000*)
34000 Mojavean Desert Scrub
34300 Blackbush Scrub
35000 Great Basin Scrub
35200 Sagebrush Scrub
35210 Big Sagebrush Scrub
36000 Chenopod Scrub
36110 Desert Saltbush Scrub
36120 Desert Sink Scrub
37000 Chaparral
37100 Upper Sonoran Mixed Chaparral
37120 Southern Mixed Chaparral
37121 Granitic Southern Mixed Chaparral
37122 Mafic Southern Mixed Chaparral
37130 Northern Mixed Chaparral*
37131 Granitic Northern Mixed Chaparral*
37132 Mafic Northern Mixed Chaparral*
37200 Chamise Chaparral
37210 Granitic Chamise Chaparral*
37220 Mafic Chamise Chaparral*
37300 Red Shank Chaparral
37400 Semi-Desert Chaparral
37500 Montane Chaparral
37510 Mixed Montane Chaparral
37520 Montane Manzanita Chaparral
37530 Montane Ceanothus Chaparral
37540 Montane Scrub Oak Chaparral
37800 Upper Sonoran Ceanothus Chaparral
37810 Buck Brush Chaparral
37830 Ceanothus crassifolius Chaparral
37900 Scrub Oak Chaparral
37A00 Interior Live Oak Chaparral
37B00 Upper Sonoran Manzanita Chaparral
37C00 Maritime Chaparral
37C30 Southern Maritime Chaparral
37G00 Coastal Sage-Chaparral Transition
37K00 Montane Buckwheat Scrub #
39000 Upper Sonoran Subshrub Scrub

40000 GRASSLANDS, VERNAL POOLS, MEADOWS, AND OTHER HERB COMMUNITIES
- 42000 Valley and Foothill Grassland
  - 42100 Native Grassland
    - 42110 Valley Needlegrass Grassland
    - 42120 Valley Sacaton Grassland
    - 42130 Saltgrass Grassland #
  - 42200 Non-Native Grassland
    - 42210 Non-Native Grassland: Broadleaf-Dominated #
      - 42211 Non-Native Grassland: Artichoke-Thistle-Dominated #
  - 42300 Wildflower Field
  - 42400 Foothill/Mountain Perennial Grassland*
    - 42470 Transmontane Perennial Grassland *# (*formerly Transmontane Dropseed Grassland*)
- 44000 Vernal Pool
  - 44300 Southern Vernal Pool
    - 44320 San Diego Mesa Vernal Pool
      - 44321 San Diego Mesa Hardpan Vernal Pool
      - 44322 San Diego Mesa Claypan Vernal Pool
- 45000 Meadows and Seeps
  - 45100 Montane Meadow
    - 45110 Wet Montane Meadow
    - 45120 Dry Montane Meadows
  - 45300 Alkali Meadows and Seeps
    - 45320 Alkali Seep
  - 45400 Freshwater Seep
- 46000 Alkali Playa Community

50000 BOG AND MARSH
- 52000 Marsh and Swamp
  - 52100 Coastal Salt Marsh
    - 52120 Southern Coastal Salt Marsh
- 52300 Alkali Marsh
  - 52310 Cismontane Alkali Marsh
- 52400 Freshwater Marsh
  - 52410 Coastal and Valley Freshwater Marsh
  - 52420 Transmontane Freshwater Marsh
  - 52430 Montane Freshwater Marsh
  - 52440 Emergent Wetland*
- 52500 Vernal Marsh
  - 52510 Herbaceous wetland #

60000 RIPARIAN AND BOTTOMLAND HABITAT
- 61000 Riparian Forests
  - 61300 Southern Riparian Forest
    - 61310 Southern Coast Live Oak Riparian Forest
    - 61320 Southern Arroyo Willow Riparian Forest
    - 61330 Southern Cottonwood-Willow Riparian Forest
  - 61500 Montane Riparian Forest
    - 61510 White Alder Riparian Forest
  - 61800 Colorado Riparian Forest
    - 61810 Sonoran Cottonwood-Willow Riparian Forest
    - 61820 Mesquite Bosque
- 62000 Riparian Woodlands
  - 62200 Desert Dry Wash Woodland
  - 62300 Desert Fan Palm Oasis Woodland
  - 62400 Southern Sycamore-Alder Riparian Woodland
  - 62500 Southern Riparian Woodland #
- 63000 Riparian Scrubs
  - 63300 Southern Riparian Scrub
    - 63310 Mule Fat Scrub
    - 63320 Southern Willow Scrub
  - 63500 Montane Riparian Scrub
  - 63800 Colorado Riparian Scrub
    - 63810 Tamarisk Scrub
    - 63820 Arrowweed Scrub
- 64000 Unvegetated Habitat *
  - 64100 Open Water *
    - 64110 Marine *
      - 64111 Subtidal *
      - 64112 Intertidal *
    - 64120 Bay *
      - 64121 Deep Bay *
      - 64122 Intermediate Bay *
      - 64123 Shallow Bay *
    - 64130 Estuarine *
      - 64131 Subtidal *
      - 64132 Intertidal *
      - 64133 Brackishwater *
    - 64140 Freshwater *
  - 64200 Non-Vegetated Channel or Floodway *
  - 64300 Saltpan/Mudflats *
  - 64400 Beach *
- 65000 Non-Native Riparian #
  - 65100 Arundo-Dominated Riparian #

70000 WOODLAND
- 71000 Cismontane Woodland
  - 71100 Oak Woodland
    - 71120 Black Oak Woodland
    - 71160 Coast Live Oak Woodland
      - 71161 Open Coast Live Oak Woodland *
      - 71162 Dense Coast Live Oak Woodland *
    - 71180 Engelmann Oak Woodland
      - 71181 Open Engelmann Oak Woodland
      - 71182 Dense Engelmann Oak Woodland
  - 71200 Walnut Woodland
- 72000 Pinon and Juniper Woodlands
  - 72300 Peninsular Pinon and Juniper Woodlands
  - 72310 Peninsular Pinon Woodland
  - 72320 Peninsular Juniper Woodland and Scrub
- 75000 Sonoran Thorn Woodland
  - 75100 Elephant Tree Woodland
- 77000 Mixed Oak Woodland *
- 78000 Undifferentiated Open Woodland *
- 79000 Non-Native Woodland * (*renamed*)
  - 79100 Eucalyptus Woodland * (*moved from 11000*)

80000 FOREST
- 81000 Broadleaved Upland Forest
  - 81100 Mixed Evergreen Forest
  - 81300 Oak Forest
    - 81310 Coast Live Oak Forest
    - 81320 Canyon Live Oak Forest
    - 81340 Black Oak Forest
- 83000 Closed-Cone Coniferous Forest
  - 83100 Coastal Closed-Cone Coniferous Forest
    - 83140 Torrey Pine Forest
  - 83200 Interior Closed-Cone Coniferous Forest
  - 83230 Southern Interior Cypress Forest
- 84000 Lower Montane Coniferous Forest
  - 84100 Coast Range, Klamath and Peninsular Coniferous Forest *
    - 84140 Coulter Pine Forest
    - 84150 Bigcone Spruce (Bigcone Douglas-Fir)-Canyon Oak Forest
  - 84200 Sierran Coniferous Forest
    - 84230 Sierran Mixed Coniferous Forest
  - 84500 Mixed Oak/Coniferous/Bigcone/Coulter Forest*