2018 BIODIVERSITY REPORT

City of Los Angeles

Appendix A

Prepared by:

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Appendix A1

Ecological Subsections Description

Ecological Subregions of California

Section and Subsection Descriptions

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USDA, Natural Resources Conservation Service
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Preface and Acknowledgments

Preface

This document contains the biophysical descriptions of the sections and subsections as depicted on the map "Ecological Units of California," (Goudey and Smith, 1994). This represents a subdivision of the ecological units shown on the map "Ecoregions and Subregions of the United States," (Bailey, etal, 1994), and described in "Ecological Subregions of the United States: Section Descriptions," (McNab and Avers,1994). The basis for these maps and documents is the National Hierarchical Framework of Ecological Units (ECOMAP, 1993). This framework provides a standardized method for classifying, mapping, and describing ecological units at various geographic planning and analysis scales in the United States.

This text, which supplements the map by describing the delineated section and subsection ecological units, is the product of collaboration and teamwork by contributors from the Forest Service and other federal agencies in California, State agencies, universities and individuals. Because this document presents information on a wide range of environmental, biological, and cultural characteristics of ecosystems at the subregion scale, many contributors were involved in its development. Each contributor drew upon personal knowledge of environmental relationships and mapping principles and obtained help from other resource specialists to develop these map units and descriptions.

This text should be viewed as a continually evolving and refined draft of our ability to recognize and describe ecosystems at the subregion scale. Because this is the first edition and it was prepared by many persons in a short time, this text undoubtedly contains errors and perhaps omits pertinent information. Also, because our current knowledge of ecosystems is evolving, new relationships will be discovered continually. The Forest Service and Natural Resources Conservation Service are committed to management based on ecological principles and intends to update the subsection map and this text as required. Users are invited to report corrections to this document and present new knowledge applicable to the subsection level in the national hierarchy. Comments and suggestions should be forwarded to the Regional Forester, USDA Forest Service, 630 Sansome Street, San Francisco, CA 94111.

Acknowledgments

The development and completion of this document in a relatively short time period is a direct result of the coordination, persistent efforts, and diligent teamwork of many persons. The maps and text were produced through the collective, diligent efforts of the following individuals.

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Island oak series, California sagebrush series, Mixed chaparral shrublands, and Coyote brush series. Dunes and adjacent uplands with a cover of eolian sand support a succession of plant communities, from bare dune through Sand-verbena - beach bursage series.

Characteristic series by lifeform include:

Dunelands: Sand-verbena - beach bursage series, Dune lupine - goldenbush series.

Grasslands: California annual grassland series.

Shrublands: Bigpod ceanothus series, Black sage series, California buckwheat series, California sagebrush series, California sagebrush - black sage series, California sagebrush series - California buckwheat series, Chamise series, Chamise - black sage series, Coyote brush series, Mixed sage series, Mixed scrub oak series, Scrub oak series, Scrub oak - chamise series.

Forests and woodlands: Bishop pine series, Coast live oak series, Hollyleaf cherry stands, Island oak series, Catalina ironwood stands, Torrey pine stands.

Climate. The mean annual precipitation is about 12 to 20 inches; it is all rain. Mean annual temperature is about 54° to 60° F, with 5 to 10° F differences between summer and winter means. The mean freeze-free period is 365 days.

Surface Water. Runoff is rapid. There are few streams, especially few in volcanic terrain, and all of them are dry through the summer. Natural lakes are absent.

Subsection 261Bd Oxnard Plain - Santa Paula Valley

This subsection includes valleys of the Santa Clara River and Calleguas Creek (which is an extension of Arroyo Simi that drains Simi Valley) and a plain at the mouths of these streams. The climate is hot and subhumid; it is modified greatly by marine air. MLRA 19d.

Lithology and Stratigraphy. This subsection contains mainly late Quaternary alluvium and lesser amounts of Plio-Pleistocene nonmarine sediments. Dune sand is present along the coast.

Geomorphology. This subsection is mostly on nearly level floodplains and very gently to gently sloping alluvial fans and terraces. There are small areas of dissected Plio-Pleistocene sediments. Dunes are present in a narrow strip adjacent to the coast. The subsection elevation range is from sea-level up to about 800 feet. Fluvial erosion and deposition are the main geomorphic processes. Wind is an important geomorphic agent along the coast, along with coastal marine processes.

Soils. The soils are mostly Fluventic, Cumulic, and Calcic Haploxerolls, and, near the coast, some Aquic Xerofluvents and Fluvaquentic Haploxerolls. Typic Argixerolls, Mollic Haploxeralfs, and Abruptic Durixeralfs are common on alluvial fans and terraces. On dissected Plio-Pleistocene sediments there are shallow Typic Xerorthents, Calcixerollic Xerochrepts, and Calcic Pachic Haploxerolls. Typic Xeropsamments are common on stabilized dunes. The soils are well to somewhat poorly drained. Calcium carbonates accumulate in some of the soils. Soil temperature regimes are thermic; and soil moisture regimes are xeric.

Vegetation. The predominant natural plant communities include California sagebrush series and Purple sage series. There are small areas of Pickleweed series.

Characteristic series by lifeform include:

Saltmarshs: Cordgrass series, Ditch-grass series, Pickleweed series.

Grasslands: California annual grassland series.

Shrublands: Black sage series, California buckwheat series, California sagebrush series, California sagebrush - black sage series, California sagebrush series - California buckwheat series, Coyote brush series, Mixed sage series, Purple sage series.

Forests and woodlands: California sycamore series, Coast live oak series.

Climate. The mean annual precipitation is about 12 to 18 inches; it is practically all rain. Summer fog is common. Mean annual temperature is about 56° to 60° F. The mean freeze-free period is about 300 to 350 days.

Surface Water. The Santa Clara River drains much of the northern part of the Transverse Ranges. It is perennial, but Calleguas Creek, which is the next largest stream that runs through the subsection, is not perennial. There are no lakes or ponds, other than temporary ponding behind dunes.

Subsection 261Be Simi Valley - Santa Susana Mountains

This subsection includes the Santa Susana Mountains, Oak Ridge, Simi Hills, valleys around the Simi Hills, and Conejo Mountain. It is between the Santa Clara River on the north and the Santa Monica Mountains on the south and stretches from the Oxnard Plain on the west to the San Fernando Valley on the east. The climate is hot and subhumid; it modified greatly to moderately by marine air. MLRAs 19d and 20d.

Lithology and Stratigraphy. This subsection contains mostly Tertiary sedimentary rocks and Quaternary alluvium. More specifically, there are Cretaceous, Eocene, Miocene, and Pliocene marine and Oligocene and Plio-Pleistocene nonmarine sedimentary rocks.

Miocene volcanic rocks also occur on and around Conejo Mountain, between the Simi Hills and the Oxnard Plain.

Geomorphology. This is a subsection of steep mountains; moderately steep to steep hills; and nearly level to gently sloping floodplains, terraces, and alluvial fans. The Santa Susana Mountains, Oak Ridge, and Simi Valley are oriented east-west. There are eroded Tertiary sedimentary rocks, or badlands, in both the Santa Susana Mountains and the Simi Hills. The subsection elevation range is about 200 to 3750 feet. Mass wasting and fluvial erosion and deposition are the main geomorphic processes.

Soils. The soils are mostly Lithic and shallow Typic Xerorthents; Calcixerollic Xerochrepts; and Lithic, Typic, Pachic, and Calcic Pachic Haploxerolls. Fluventic Haploxerolls are common in recent alluvium. There are Typic Argixerolls, Mollic Haploxeralfs, and Abruptic Durixeralfs on terraces and old alluvial fans. The soils are well drained. Carbonates accumulate in some of the soils. Soil temperature regimes are thermic, and soil moisture regimes are mostly xeric.

Vegetation. The predominant natural plant communities include California sagebrush series, Mixed sage series, Chamise series, Mixed scrub oak series, and Coast live oak series. Valley oak series is common on recent alluvial plains, and there is some Bigcone Douglas-fir - canyon live oak series on north-facing slopes at higher elevations. There are small areas of California walnut series.

Characteristic series by lifeform include:

Grasslands: California annual grassland series.

Shrublands: Bigpod ceanothus series, Black sage series, California buckwheat series, California buckwheat - white sage series, California sagebrush series, California sagebrush - black sage series, California sagebrush series - California buckwheat series, Chamise series, Chamise - black sage series, Coyote brush series, Mixed sage series, Mixed scrub oak series, Purple sage series, Scrub oak series, Scrub oak - chamise series, White sage series.

Forests and woodlands: California bay series, California sycamore series, California walnut series, Coast live oak series, Bigcone Douglas-fir - canyon live oak series, Valley oak series.

Climate. The mean annual precipitation is about 16 to 20 inches. It is practically all rain. Mean annual temperature is about 52° to 62° F. The mean freeze-free period is about 275 to 325 days.

Surface Water. Runoff is rapid and all streams are generally dry during the summer. There are no natural lakes.

Subsection 261Bf
Santa Monica Mountains

This subsection consists of the Santa Monica Mountains, which are bounded by ocean, plains, and valleys on all but the north side. On the north it is separated from the Simi Hills and the Conejo Mountain by small valleys and low passes. The climate is hot and subhumid; it is modified greatly on the south side to moderately on the north side of the mountains by marine influence. MLRAs 19d and 20d.

Lithology and Stratigraphy. This subsection contains mainly Mesozoic and Tertiary sedimentary rocks and Miocene volcanic rocks. More specifically, there are Triassic, Jurassic, Cretaceous, Eocene, and Miocene marine and Oligocene and Plio-Pleistocene nonmarine sedimentary rocks. The Miocene volcanic rocks are mostly andesite, basalt, and pyroclastic rocks. Marine terraces are narrow and not well represented in the subsection. There is little recent alluvium in the valleys.

Geomorphology. This is a subsection of steep mountains with narrow to broad summits and narrow canyons. The mountains trend east-west. The elevation range is from sea-level up to 3111 feet on Sandstone Peak. There many are other peaks and ridges above 2500. Mass wasting and fluvial erosion and deposition are the main geomorphic processes.

Soils. The soils are mostly Lithic Xerorthents; Lithic and Calcixerollic Xerochrepts; Lithic, Pachic, and Calcic Pachic Haploxerolls; Typic Argixerolls; and Ultic Palexerolls. Also, there are Fluventic Haploxerolls in recent alluvium. The soils are well drained. Carbonates accumulate in some of the soils. The soil temperature regimes are thermic. Soil moisture regimes are mostly xeric.

Vegetation. The predominant natural plant communities include California sagebrush - California buckwheat series and Mixed sage series at lower elevations and Chamise series and Mixed chaparral shrublands at higher elevations. There is some Coast live oak series.

Characteristic series by lifeform include:

Grasslands: California annual grassland series.

Shrublands: Bigpod ceanothus series, Black sage series, California buckwheat series, California buckwheat - white sage series, California encelia series, California sagebrush series, California sagebrush - black sage series, California sagebrush series - California buckwheat series, Chamise series, Chamise - black sage series, Chamise - chaparral whitethorn series Coyote brush series, Coast pickleweed series, Mixed sage series, Mixed scrub oak series, Scrub oak series, Scrub oak - birchleaf mountain-mahogany series, Scrub oak - chamise series, Sumac series, White sage series.

Forests and woodlands: California bay series, California sycamore series, California walnut series, Coast live oak series, Valley oak series.

Climate. The mean annual precipitation is about 15 to 25 inches. It is practically all rain. Mean annual temperature is about 54° to 62° F. The mean freeze-free period is about 300 to 350 days.

Surface Water. Runoff is rapid and the streams are generally dry during the summer. There are no natural lakes.

Subsection 261Bg Los Angeles Plain

This subsection consists of the Los Angeles Plain and the San Fernando Valley and includes the Verdugo Mountains, San Rafael Hills, and Palos Verdes Hills. The Los Angeles Plain, which is the largest part of the subsection is south of the Santa Monica and San Gabriel Mountains and west of the San Jose and the Puente Hills. The climate is hot and subhumid; it is modified by marine influence greatly on the Los Angeles Plain and moderately in the San Fernando Valley. MLRA 19d.

Lithology and Stratigraphy. This subsection contains mainly Quaternary alluvium. The Verdugo Mountains and San Rafael Hills are geologically similar to the San Gabriel Mountains; they are mostly Pre-Cambrian gneiss and Mesozoic granitic rocks. The Palos Verdes Hills are mostly Miocene sedimentary rocks.

Geomorphology. This is a subsection of nearly level floodplains and terraces and very gently to gently sloping alluvial fans. There are small areas of marine terraces, but they are relatively inextensive compared to fluvial terraces. Steep mountains and moderately steep hills are small but important parts of the subsection. Dunes are present along the coast north of the Palos Verdes Hills and sand has spread across Quaternary terraces behind those dunes. The subsection elevation range is from sea-level to about 1000 feet on the Los Angeles Plain, slightly higher in the San Fernando Valley, and up to 3077 feet in the Verdugo Mountains. Fluvial erosion and deposition are the main geomorphic processes. Mass wasting is important in the mountains, and wind is an important geomorphic agent along the coast.

Soils. The soils are mostly Typic Xerorthents and Typic and Mollic Haploxeralfs. Soils in the Verdugo Mountains and San Rafael Hills are shallow Typic Xerorthents, Lithic Haploxerolls, Typic and Calcixerollic Xerochrepts, and Typic Haploxeralfs. Soils on Miocene sedimentary rocks are shallow Typic Xerorthents, Calcic and Pachic Haploxerolls, Typic Argixerolls, and Chromoxererts and Pelloxererts. The soils in dune sand are Typic Xeropsamments. The soils are well drained. Carbonates accumulate in some of the soils. Soil temperature regimes are thermic, and soil moisture regimes are xeric.

Vegetation. The predominant natural plant communities are California sagebrush - California buckwheat series and Mixed sage series. Coast live oak series and California walnut series are common, but not extensive. Chamise series and Mixed chaparral shrublands are common in the Verdugo Mountains and San Rafael Hills. California sycamore series occurs in riparian areas and there is some Pickleweed series around San Pedro Bay.

Characteristic series by lifeform include:

Dunelands: Sand-verbena - beach bursage series, Dune lupine-goldenbush series.

Saltmarshs: Cordgrass series, Ditch-grass series, Pickleweed series.

Grasslands: California annual grassland series.

Shrublands: Black sage series, California buckwheat series, California buckwheat - white sage series, California encelia series, California sagebrush series, California sagebrush - black sage series, California sagebrush series - California buckwheat series, Chamise series, Chamise - black sage series, Coast pickle-pear series, Coyote brush series, Mixed sage series, Sumac series, White sage series.

Forests and woodlands: California sycamore series, California walnut series, Coast live oak series.

Climate. The mean annual precipitation is about 12 to 20 inches; it is practically all rain. Summer fog is common. Mean annual temperature is about 58° to 64° F. The mean freeze-free period is about 300 to 350 days.

Surface Water. The Los Angeles River is the largest stream on the Plain. It drains the San Fernando Valley and much of the San Gabriel Mountains. Most of the streams are dry through the summer. There are no lakes or ponds, other than temporary ponding behind dunes.

Subsection 261Bh Southern Channel Islands

This subsection includes San Clemente, San Nicolas, Santa Barbara, and Santa Catalina Islands. It has a hot and subhumid climate that is moderated by the ocean. MLRA 20.

Lithology and Stratigraphy. This subsection contains mostly Miocene volcanic rocks, Tertiary subvolcanic (hypabyssal) rocks, and, on San Clemente Island, marine sedimentary rocks of the Franciscan Complex. There are minor amounts of Pre-Cretaceous metamorphic and ultramafic rocks on San Clemente Island. San Nicolas Island is mostly Eocene sedimentary rock and a cover of Quaternary deposits.

Fourwing saltbush series, Hop-sage series, Mixed saltbush series, Mixed scrub oak series, Mountain whitethorn series, Mulefat series, Nolina series, Purple sage series, Scalebroom series, Scrub oak series, Shadscale series, White sage series.

Forests and woodlands: Black oak series, Birchleaf mountain-mahogany series, California juniper series, Canyon live oak series, Coast live oak series, Curlleaf mountain-mahogany series, Coulter pine series, Coulter pine - canyon live series, Singleleaf pinyon series.

Climate. The mean annual precipitation is about 12 to 20 inches. Most of it is rain, except at higher elevations. Mean annual temperature is about 45° to 60° F. The mean freeze-free period is about 200 to 250 days.

Surface Water. Runoff is rapid. All but the larger streams are dry through the summer. Most of the streams drain through the Santa Clara river to the ocean, but those near the San Andreas fault drain into closed drainage basins. Natural lakes are absent, except along the San Andreas fault. There are numerous sag ponds along the San Andreas fault.

Subsection M262Bd San Gabriel Mountains

This subsection comprises the lower and warmer parts of the San Gabriel Mountains, which are between the San Andreas fault on the north-northeast and the Los Angeles and Fontana Plains on the south. It is bounded by the Soledad River valley on the northwest and the San Fernando Valley on the southwest and extend eastward to the Cajon Pass. The climate is hot to temperate, and subhumid. MLRA 20e.

Lithology and Stratigraphy. This subsection contains mostly Mesozoic granitic rocks and Pre-Cambrian anorthosite. Also, there is some Pre-Cretaceous Pelona schist.

Subsection M262Bd, North Fork Lytle Creek area near Cajon Pass — *Robert Ettner*

Geomorphology. This is a subsection of steep and very steep mountains with narrow to rounded summits and narrow canyons. The mountains trend east-west, but hills along the San Andreas fault trend west-northwest. The subsection elevation range is from about 500 feet up to 6000 feet. Mass wasting and fluvial erosion are the main geomorphic processes.

Soils. The soils are mostly Lithic and shallow Typic Xerorthents, shallow Entic Haploxerolls, and Calcic Haploxerolls. Most of the soils, but not all, are leached free of carbonates. The soils are well drained. Soil temperature regimes are mostly thermic, and some mesic on north-facing slopes at higher elevations. Soil moisture regimes are xeric.

Vegetation. The predominant natural plant communities are Chamise series and Chamise - hoaryleaf ceanothus series, which are generally on shallow and very stony soils. Live oak chaparral series and Mixed chaparral shrublands also occur. Ponderosa pine series with some Bigcone Douglas-fir series and Bigcone Douglas-fir - canyon live oak series occurs on north-facing slopes, Jeffrey pine series occurs on the north-northeast side of the mountains, and California juniper series occurs on hills along the San Andreas fault.

Characteristic series by lifeform include:

Grasslands: Beaked sedge series, Bur-reed series, California annual grassland series, Tufted hairgrass series.

Shrublands: Big sagebrush series, Bitterbrush series, Black bush series, Black sagebrush series, California buckwheat series, California buckwheat series, Chamise series, Chamise - bigberry manzanita series, Chamise - white sage series, Chamise - black sage series, Chamise - hoaryleaf ceanothus series, Chaparral whitethorn series, Cupleaf ceanothus - fremontia - oak series, Fourwing saltbush series, Hairyleaf ceanothus series, Hoaryleaf ceanothus series, Hop-sage series, Mixed saltbush series, Mixed scrub oak series, Mountain whitethorn series, Mulefat series, Nolina series, Parry rabbitbrush series, Scalebroom series, Scrub oak series, Scrub oak - chaparral whitethorn series, Shadscale series, White sage series.

Forests and woodlands: Birchleaf mountain-mahogany series, California juniper series, Coulter pine series, Coulter pine - canyon live oak series, Bigcone Douglas-fir series, Bigcone Douglas-fir - canyon live oak series, Canyon live oak series, Coast live oak series, Curlleaf mountain-mahogany series, Ponderosa pine series, Singleleaf pinyon series.

Climate. The mean annual precipitation is about 20 to 30 inches. Most of it is rain. Mean annual temperature is about 45° to 60° F. The mean freeze-free period is about 200 to 275 days.

Surface Water. Runoff is rapid. All but the larger streams are dry through the summer. Natural lakes are absent, except along the San Andreas fault. There are some sag ponds along the San Andreas fault.

Subsection M262Be Upper San Gabriel Mountains

This subsection comprises the higher and cooler parts of the San Gabriel Mountains. The climate is temperate to cold and subhumid. MLRA 20e.

Lithology and Stratigraphy. This subsection contains mostly Mesozoic granitic rocks and Pre-Cretaceous Pelona schist. Also, there are some Pre-Cambrian plutonic and metamorphic rocks and small areas of Quaternary alluvium.

Geomorphology. This is a subsection of steep and very steep mountains with narrow to rounded summits and narrow canyons. The mountains trend east-west. The subsection elevation range is from about 5000 feet, or lower on north-facing slopes, up to 10,080 feet on Mount San Antonio (Old Baldy). Mass wasting and fluvial erosion are the main geomorphic processes.

Soils. The soils are mostly Lithic Xerorthents, shallow Entic Haploxerolls, Lithic Haploxerolls, and Xerochrepts. There are some small areas of Xerofluvents and Haploxerolls on Quaternary alluvium. Most of the soils are leached free of carbonates. The soils are well drained. Soil temperature regimes are mostly mesic, and some are frigid. Soil moisture regimes are xeric.

Vegetation. The predominant natural plant communities are Coulter pine series, Mixed conifer series on the south side, and Jeffrey pine series on the north side of the mountains. Lodgepole pine series is common at the highest elevations, and Limber pine series occurs on dry slopes.

Subsection M262Be, Crystal Lake Basin area — *Robert Ettner*

Characteristic series by lifeform include:

Grasslands: Beaked sedge series, Bur-reed series, Shorthair sedge series, Tufted hairgrass series.

Shrublands: Bush chinquapin series, Chamise series, Deerbrush series, Eastwood manzanita series, Greenleaf manzanita series, Holodiscus series, Mixed scrub oak series, Mountain whitethorn series, Parry rabbitbrush series, Rothrock sagebrush series, Rubber rabbitbrush series, Scrub oak series, Scrub oak - chaparral whitethorn series.

Forests and woodlands: Bigcone Douglas-fir series, Bigcone Douglas-fir - canyon live oak series, Birchleaf mountain-mahogany series, Black cottonwood series, Canyon live oak series, Coast live oak series, Curlleaf mountain-mahogany series, Coulter pine series, Coulter pine - canyon live oak series, Incense-cedar series, Jeffrey pine series, Limber pine series, Lodgepole pine series, Mixed conifer series, Mixed subalpine forest series, Mountain juniper series, Ponderosa pine series, White fir series.

Climate. The mean annual precipitation is about 30 to 40 inches; much of it is snow. Mean annual temperature is about 40° to 50° F. The mean freeze-free period is about 150 to 225 days.

Surface Water. Runoff is rapid. All but the larger streams are dry through the summer. Natural lakes are absent.

Subsection M262Bf Santa Ana Mountains

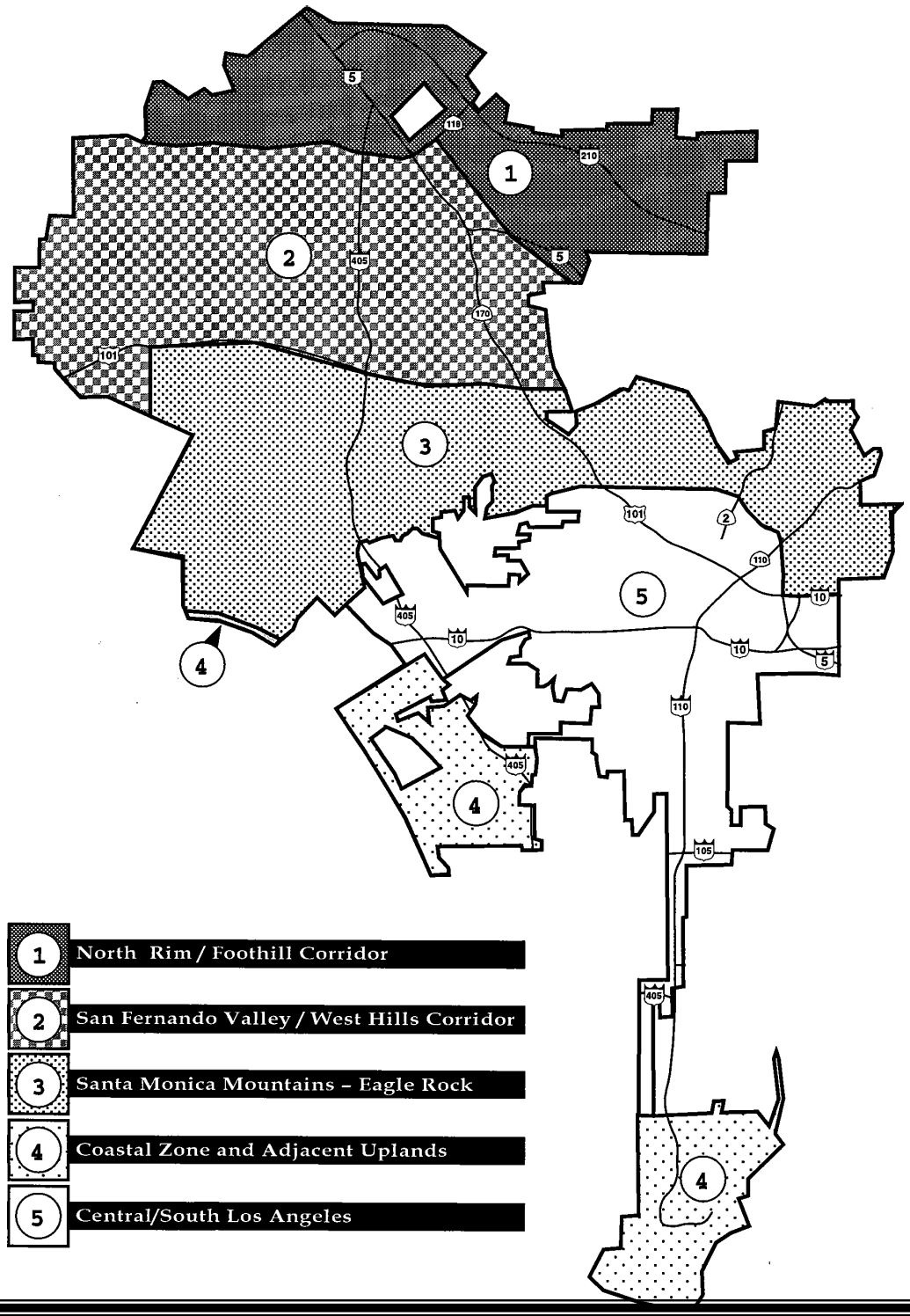
This subsection includes the Puente and Chino Hills, which are northwest of the Santa Ana River, and most of the Santa Ana Mountains, which are southeast of the Santa Ana River. The climate is hot and subhumid; it is modified moderately by marine influence. MLRA 20d.

Lithology and Stratigraphy. This subsection contains mostly Jurassic marine clastic sedimentary, Jurassic volcanic, and Mesozoic granitic rocks. There is some mafic plutonic rock and small areas of Pleistocene basalt. The Puente and Chino Hills consist of Miocene marine sedimentary rocks.

Geomorphology. This is a subsection of steep to very steep mountains with narrow to rounded summits and narrow canyons. There are some rolling plateau surfaces, also. The hills northwest of the Santa Ana River are steep. These hills and the Santa Ana Mountains trend northwest. The Santa Ana Mountains are bounded on the northeast by a steep escarpment along the Elsinore Fault Zone, and the Puente and Chino Hills are bounded on

Appendix A2

Sensitive Biological Resources



Planning
Consultants
Research

Exhibit C-1
Habitat-Oriented Biological Assessment Planning Zones

Exhibit C-7
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES[1]

KEY

State Status - California Department of Fish and Game (CDFG)	
SE	State Listed Endangered
ST	State Listed Threatened
CSC	Species of Special Concern[2]
SCE	State Candidate Endangered
SCT	State Candidate Threatened
SFP	State Fully Protected
SP	State Protected
SR	State Listed Rare
Federal Status - U.S. Fish and Wildlife Service (USFWS)	
FE	Federally Listed Endangered
FT	Federally Listed Threatened
FCH	Federally Listed Critical Habitat
FPE	Federally Proposed Endangered
FPT	Federally Proposed Threatened
FPCH	Federally Proposed Critical Habitat
FPD	Federally Proposed Delisting
FC	Federal Candidate Species
EXT	Extinct

_____

1 This list is current as of January 2001. Check the most recent state and federal lists for updates and changes, or consult the CDFG's California Natural Diversity Database.

2 CSC - California Special Concern species. The Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long term viability. Not all "Species of Special Concern" have declined equally; some species may be just starting to decline, while others may have already reached the point where they meet the criteria for listing as a "Threatened" or "Endangered" species under the State and/or Federal Endangered Species Acts.

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

KEY (continued)

California Native Plant Society (CNPS)	
1A	Plants presumed extinct in California[3]
1B	Plants that are rare, threatened, or endangered in California or elsewhere[3]
2	Plants that are rare, threatened, or endangered in California, but more common elsewhere[3]
3	Plants about which more information is needed - a review list[4]
4	Plants of limited distribution - a watch list[5]

Habitat Code Designations - California Natural Diversity Database (CNDDB)	
AF	Alluvial Fan Sage Scrub
BW	Brackish Water
CB	Coastal Bluff Scrub
CD	Coastal Dunes
CH	Chaparral
CL	Coastal Lagoon

3 *All of the plants constituting Lists 1A, 1B, and 2 meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endatnered Species Act) of the California Department of Fish and Game Code, and are eligible for listing. According to the DFG, if the taxa on List 1A are rediscovered, they should be fully considered during preparation of environmental documents relating to CEQA. List 1B and 2 plants should be fully considered during preparation of environmental documents relating to CEQA.*

4 *Some of the plants constituting List 3 meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and are eligible for listing. The DFG recommends that List 3 plants be evaluated for consideration during preparation of environmental documents relating to CEQA.*

5 *Very few of the plants constituting List 4 meet the definitions of Section 1901, Chapter 10 (Native Plant Protection Act) or Sections 2062 and 2067 (California Endangered Species Act) of the California Department of Fish and Game Code, and few, if any, are eligible for listing. Nevertheless, many of them are significant locally, and the DFG recommends that List 4 plants be evaluated for consideration during preparation of environmental documents relating to CEQA. This may be particularly appropriate for the type locality of a List 4 plant, for populations at the periphery of a species' range or in areas where the taxon is especially uncommon or has sustained heavy losses, or for populations exhibiting unusual morphology or occurring on unusual substrates.*

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

KEY (continued)

Habitat Code Designations - California Natural Diversity Database (CNDDB) (Con't)	
CM	Coastal Salt Marsh
CO	Coastal Habitats
CP	Chenopod Scrub
CS	Coastal Sage Scrub
DR	Desert Riparian
DW	Desert Wash
ES	El Segundo Dunes
ET	Estuary
FM	Freshwater Marsh
GL	Grassland (native or introduced)
MF	Montane Forest (mixed hardwood, coniferous)
OW	Oak Woodland (coast live, valley, canyon or scrub oaks)
PJ	Pinyon-Juniper Woodland
PL	Playa Habitats, coastal or inland
RP	Riparian Scrub
RV	Rivers (open water or aquatic habitats)
RW	Riparian Woodland
SG/SJ	San Gabriel/San Jacinto Mountains
VP	Vernal Pools
WA	Water (general open water habitats)

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

SCIENTIFIC NAME	COMMON NAME	STATUS	ZONE *	HABITAT
Invertebrates				
Euphilotes battoides allyni	El Segundo blue butterfly	FE	4	CD
Glaucopsyche lygdamus palosverdesensis	Palos verdes blue butterfly	FE, FCH	4	CS
Raphiomidas t. terminatus	El Segundo flower-loving fly	EXT	4	ES
Streptocephalus woottoni	Riverside fairy shrimp	FE, FPCH	4	CH
Fish				
Catostomus santaanae	Santa Ana sucker	CSC, FT	1,3	RV
Eucyclogobius newberryi	tidewater goby	CSC, FE, FPD, FCH	4	BW
Gasterosteus aculeatus williamsoni	unarmored threespine stickleback	FE, FPCH, SE, SFP	Unknown	
Gila orcutti	arroyo chub	CSC	1,2,3,4	RV
Onchorhynchus mykiss	southern steelhead	FE, FCH, CSC	Unknown	
Rhinichthys osculus ssp. 3	Santa Ana speckled dace	CSC	1	RV
Amphibians				
Bufo microscaphus californicus	arroyo southwestern toad	CSC, SP, FE, FCH	1,2,3,4	RV, DR
Rana aurora draytoni	California red-legged frog	FT, FPCH, CSC, SP	1,2,3,4	
Rana muscosa	So. California population of mountain yellow-legged frog	FPE, CSC, SP	1,2,3,4	
Scaphiopus hammondii	western spadefoot toad	CSC, SP	1	VP, RV, CS, CH
Reptiles				
Anniella p. pulchra	silvery legless lizard	CSC	1,2,3,4	CH, OW, CS
Clemmys marmorata pallida	southwestern pond turtle	CSC, SP	1,2,3,4	RV
Lampropeltis zonata pulchra	San Diego mountain kingsnake	CSC, SP	1,2,3	CH, CS, OW
Phrynosoma coronatum blainvillei	San Diego horned lizard	CSC, SP	1,2,3,4	CS, CH, AF
Salvadora hexalepis virgultea	coast patch-nosed snake	CSC	1,2,3,4	CS, CH, OW
Thamnophis (Nerodia) hammondii	two-striped garter snake	CSC, SP	1,2,3,4	RV, FM
Xantusia riversiana	island night lizard	FT, SP	1,2,3,4	

* Refer to Exhibit C-1.

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

SCIENTIFIC NAME	COMMON NAME	STATUS	ZONE *	HABITAT
Birds				
Accipiter cooperii	Cooper's hawk (nest)	CSC	1,2,3,4	RW, OW
Accipiter striatus (migrant)	sharp-shinned hawk (nest)	CSC	1,2,3,4	RW
Aimophila ruficeps canescens	So. Cal.rufous-crowned sparrow	CSC	1,2,3,4	CS, CH
Amphispiza b. belli	Bell's sage sparrow	CSC	1,2,3,4	CS, CH
Asio flammeus	short-eared owl	CSC	3,4	CM, FM
Asio otus	long-eared owl	CSC	1,2,3,4	OW, RP
Athene cunicularia hypugea	burrowing owl	CSC	1,2,3,4	GL, DW, CS, CB
Charadrius alexandrinus nivosus	western snowy plover	FT, FCH, CSC	4	PL, ET, CD
Charadrius montanus	mountain plover	FPT, CSC	1,2,3	
Chlidonias niger	black tern	CSC	4	PL, CO, ET
Circus cyaneus	northern harrier (nest)	CSC	1,2,3,4	FM, ET, CM
Coccyzus americanus occidentalis	western yellow-billed cuckoo	SE	1,2,3,4	RW
Cypseloides niger (migrant)	black swift (nest)	CSC	1,2,3,4	RV, waterfalls
Dendroica petechia brewsteri	yellow warbler (nest)	CSC	1,2,3,4	RP, RW, CH
Elanus leucurus	white-tailed kite	SFP	1,2,3,4	GL, ET, FM, OW
Epidonax traillii	willow flycatcher (all subspecies)	SE	1,3	RW, RP
Epidonax traillii extimus	Southwestern willow flycatcher	FE, FCH, SE	1,3	RW, RP
Eremophila alpestris actia	California horned lark	CSC	1,2,3,4	GL, CS
Falco columbarius (migrant)	Merlin	CSC	1,2,3,4	gen. Flyover
Falco mexicanus	prairie falcon (nest)	CSC	1,2,3,4	DR, DW, CH
Falco peregrinus anatum	American peregrine falcon	(FE delisted 8/25/99) SE, SFP	1,2,3,4	CO, PL, ET
Icteria virens	yellow-breasted chat (nest)	CSC	1,2,3,4	RP, RW
Ixobrychus exilis hesperis (migrant)	western least bittern	CSC	1,2,3,4	RP, ET, FM, SM
Lanius ludovicianus	Loggerhead shrike	CSC	1,2,3,4	CS, CH, CP, DW

* Refer to Exhibit C-1

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

SCIENTIFIC NAME	COMMON NAME	STATUS	ZONE *	HABITAT
Birds (cont'd.)				
Laterallus jamaicensis coturniculus	California black rail	ST, SFP	4	FM, CM
Numenius americanus	long-billed curlew (nest)	CSC	4	CO, WA
Pandion haliaetus (migrant)	osprey (nest)	CSC	1,2,3,4	CO, WA, RV
Passerculus sanwichensis beldingi	Belding's savannah sparrow	SE	4	CM
Pelecanus occidentalis californicus	California brown pelican	SE, FE, SFP	4	CO
Phalacrocorax auritus	double-crested cormorant (rookery)	CSC	1,2,3,4	CO, WA, RV
Piranga rubra (migrant)	summer tanager	CSC	1,4	RW
Polioptila c. californica	California gnatcatcher	FT, FCH, CSC	1,4	CS, CH
Rallus longirostris levipes	light-footed clapper rail	SE, FE, SFP	4	CM
Riparia riparia (migrant)	bank swallow	ST	1,2,3	CO, RP, RV
Sterna antillarum browni	California least tern	SE, FE, SFP	4	CD, ET, PL
Vermivora virginiae (migrant)	Virginia's warbler	CSC	3	CH, OW, RW
Vireo bellii pusillus	least Bell's vireo	SE, FE, FCH	1,2,3	RP, RW
Mammals				
Antrozous pallidus pacificus	pallid bat	CSC	1,2,3,4	CS,CH,GL
Eumetopias jubatus	northern sea lion	FT	4	CO
Eumops perotis californicus	California mastiff bat	CSC	1,2,3,4	general
Lepus californicus bennettii	San Diego blacktailed jackrabbit	CSC	1,2,3,4	CS,CP,CH, DW
Macrotus californicus	California leaf-nosed bat	CSC	1	general
Microtis californicus stephensii	Stephen's California vole	CSC	4	FM,GL
Neotoma lepida intermedia	San Diego desert woodrat	CSC	1,2,3,4	CS,CH,DW
Onychomys torridus ramona	southern grasshopper mouse	CSC	1,3	CL,CS,CH, DW
Perognathus longimembris brevinasus	Los Angeles pocket mouse	CSC	1,4	CS,CH,DW
Perognathus longimembris pacificus	Pacific pocket mouse	CSC, FE	4	CS
Plecotus townsendii pallescens	pale big-eared bat	CSC	1,2,3,4	DW,CH,OW
Sorex ornatus salicornicus	southern Calif. saltmarsh shrew	CSC	4	CM

* Refer to Exhibit C-1

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

SCIENTIFIC NAME	COMMON NAME	STATUS	ZONE*	HABITAT
Plants				
Abronia maritima	red sand-verbena	4	4	CD
Acanthomintha obovata cordata	heart-leaved thorn-mint	4	unknown	CH,OW,PJ, GL
Androsace elongata acuta	California androsace	4	unknown	CH,OW,CS
Aster greatae	Greata's aster	1B	unknown	CH
Astragalus brauntonii	Braunton's milk vetch	FE, 1B	2,3	MF,CH,CS, GL
Astragalus pycnostachyus v. *lanosissimus*	Ventura marsh milk-vetch	SE, FPE, 1B	3,4	CM
Astragalus tener v. *titi*	coastal dunes milk-vetch	SE, FE, 1B	4	CB,CD
Atriplex pacifica	south coast saltscale	1B	4	CB,CS,PL
Atriplex parishii	Parish's brittlescale	1B	1	CS,VP,PL
Atriplex serenana v. *davidsonii*	Davidson's saltscale	1B	unknown	CBS,CS
Baccharis malibuensis	Malibu baccharis	1B	3	CS,CH,OW
Baccharis p. plummerae	Plummer's baccharis	4	3	MF,CH,OW,CS
Berberis nevinii	Nevin's barberry	SE, FE, 1B	1,2,3	CH,AF,CS
Calandrinia breweri	Brewer's calandrinia	4	unknown	CH,CS
Calandrinia maritima	seaside calandrinia	4	4	CBS,GL
Calochortus catalinae	Catalina mariposa lily	4	1,2,3	CH,OW,CS, GL
Calochortus c. v. *clavatus*	club-haired mariposa lily	4	1,3	CH,OW,GL
Calochortus plummerae	Plummer's mariposa lily	1B	3	CH,OW,CS, GL,MF
Calystegia peirsonii	Peirson's morning-glory	4	1	CH,CS,OW, CS,MF
Calystegia sepium binghamiae	Santa Barbara morning-glory	1A	4	CM
Camissonia lewisii	Lewis's evening-primrose	3	unknown	CB,OW,CD, CS,GL
Castilleja plagiotoma	Mojave Indian paintbrush	4	1	PJ,GB
Centromadia parryi ssp. australis (Hemizonia minthornii)	Santa Susana tarplant	SR, 1B	1,2,3	CH, CS
Cercocarpus betuloides v. *blancheae*	island mountain-mahogany	4	3	CH
Chorizanthe parryi v. *fernandina*	San Fernando Valley spineflower	SCE, FC, 1B	1,3	CS
Chorizanthe p. v. *parryi*	Parry's spineflower	3	3	CS,AF,CH, OW
Chorizanthe spinosa	Mojave spineflower	4	1	CS,DW
Convolvulus simulans	small-flowered morning-glory	4	unknown	CS,GL
Cordylanthus m. maritimus	salt marsh bird's-beak	SE, FE, 1B	4	CM
Crossosoma californicum	Catalina crossosoma	1B	4	CS

Refer to Exhibit C-1

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

SCIENTIFIC NAME	COMMON NAME	STATUS	ZONE *	HABITAT
Plants (Con't)				
Deinandra minthornii (Hemizonia parryi australis)	southern tarplant	1B	Unknown	ET, GL, VP
Dichondra occidentalis	western dichondra	4	4	CH,OW,CS, GL
Dithyrea maritima	beach spectaclepod	ST, 1B	4	CD,CS
Dodecahema leptoceras	slender-horned spineflower	SE, FE,1B	1	AF,CH
Dudleya b. blochmaniae	Blochman's dudleya	1B	3	CS,CB,CH, GL
Dudleya cymosa marcescens	marcescent dudleya	SR, FT, 1B	3	CH
Dudleya cymosa ovatifolia	Santa Monica Mtns. dudleya	FT, 1B	3,4	CH,CS
Dudleya multicaulis	many-stemmed dudleya	1B	2	CH,CS,GL
Dudleya virens	bright green dudleya	1B	4	CH,CS
Erysimum insulare suffrutescens	suffrutescent wallflower	4	unknown	CB,CD,CS
Fremontodendron mexicanum	Mexican flannelbush	SR, FE, 1B	1,2,3	MF,CH,OW
Galium angustifolium gabrielense	San Antonio Canyon bedstraw	4	1	MF
Galium cliftonsmithii	Santa Barbara bedstraw	4	2,4	OW
Galium johnstonii	Johnston's bedstraw	4	unknown	MF
Goodmania luteola	golden goodmania	4	Unknown	DW,PL,GL
Helianthus nuttallii parishii	Los Angeles sunflower	1A	3	CM,FM
Heuchera abramsii	Abram's alumroot	4	Unknown	MF
Heuchera elegans	urn-flowered alumroot	4	Unknown	MF
Hulsea vestita gabrielensis	San Gabriel Mtns. sunflower	4	1	MF
Juglans c. v. *californica*	So.Cal. black walnut	4	1,2,3	CH,OW,AF
Juncus acutus leopoldii	southwestern spiny rush	4	4	CD,CM
Juncus duranii	Duran's rush	4	Unknown	MF
Lasthenia glabrata coulteri	Coulter's goldfields	1B	Unknown	CM,PL,VP
Lepechinia fragrans	fragrant pitcher sage	4	3	CH
Lilium humboldtii ocellatum	ocellated Humboldt lily	4	1,2,3	CH,OW,CO
Linanthus orcuttii	Orcutt's linanthus	1B	Unknown	CH,MF
Lupinus elatus	silky lupine	4	Unknown	MF
Lupinus excubitus v. *johnstonii*	interior bush lupine	4	Unknown	MF
Lupinus peirsonii	Peirson's lupine	1B	Unknown	CH,CS,RW
Malacothamnus davidsonii	Davidson's bush mallow	1B	1,3	CS,RW
Microseris douglasii v. *platycarpha*	small-flowered microseris	4	Unknown	OW,CS,GL
Monardella cinerea	gray monardella	4	Unknown	MF

Refer to Exhibit C-1

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

SCIENTIFIC NAME	COMMON NAME	STATUS	ZONE *	HABITAT
Plants (Con't)				
Monardella viridis saxicola	rock monardella	4	Unknown	CH,MF
Mucronea californica	California spineflower	4	Unknown	CH,CD,CS, GL
Muilla coronata	crowned muilla	4	Unknown	DW
Nama stenocarpum	mud nama	2	Unknown	FM
Nemacaulis d. v. *denudata*	coast woolly-heads	2	4	CD
Nemacladus gracilis	slender nemacladus	4	Unknown	OW,GL
Orcuttia californica	California Orcutt grass	SE, FE,1B	1,4	VP
Oreonana vestita	woolly mountain-parsley	1B	Unknown	MF
Oxytheca caryophylloides	chickweed oxytheca	4	Unknown	MF
Pentachaeta lyonii	Lyon's pentachaeta	SE, FE, 1B	3,4	CH,GL
Perideridia g. gairdneri	Gairdner's yampah	4	Unknown	CH,GL,VP,MF
Perideridia pringlei	adobe yampah	4	Unknown	CH,OW,CS
Phacelia exilis	Transverse Range phacelia	4	Unknown	MF
Phacelia mohavensis	Mojave phacelia	4	Unknown	OW,MF
Phacelia stellaris	Brand's phacelia	1B	Unknown	CD,CS
Polygala cornuta v. *fishiae*	Fish's milkwort	4	4	CH,OW,RW
Quercus engelmannii	Engelmann oak	4	Unknown	CH,OW,RW,GL
Ribes divaricatum v. *parishii*	Parish's gooseberry	1B	2	RW
Romneya coulteri	Coulter's matilija poppy	4	Unknown	CH,CS
Scutellaria bolanderi austromontana	southern skullcap	1B	Unknown	CH,OW,MF
Selaginella asprella	bluish spike-moss	4	Unknown	MF
Senecio ionophyllus	Tehachapi ragwort	4	Unknown	MF
Suaeda esteroa	estuary seablite	1B	4	CM
Suaeda taxifolia	woolly seablite	4	4	CB,CM
Swertia neglecta	pine green-gentian	4	Unknown	MF
Syntrichopappus lemmonii	Lemmon's syntrichopappus	4	Unknown	CH
Thermopsis californica v. *argentata*	silvery false lupine	4	Unknown	MF

Refer to Exhibit C-1

Exhibit C-7, continued
SENSITIVE SPECIES COMPENDIUM - CITY OF LOS ANGELES

NDDB Highest Inventory Priority Plant Communities of Los Angeles City	
Community	**Mapping Zone of Occurrence (NDDB data)**
Walnut Forest	3
California Walnut Woodland	1,2
Valley Oak Woodland	1,2
Southern Willow Scrub	1
Southern Sycamore Alder Riparian Woodland	1,2,3
Southern Mixed Riparian Forest	1
Southern Cottonwood Willow Riparian Forest	1,3
Southern Coast Live Oak Riparian Forest	1,2,3
Riversidian Alluvial Fan Sage Scrub	1
Valley Needlegrass Grassland	2
Southern Dune Scrub	1
Southern Coastal Bluff Scrub	4
Coastal Salt Marsh	3

Source: Frank Hovore & Associates, December 1995; Environmental Affairs Department, 2001.

Appendix A3

Vegetation Alliance Descriptions

Vegetation Descriptions

SOUTH COAST AND MONTANE ECOLOGICAL PROVINCE

CALVEG ZONE 7

March 30, 2009

Note: This Province consists of the Southern California Mountains and Valleys Section or "Mountains" (M262B) and the Southern California Coast Section or "Coast" (262B)

Note the slope gradients as follows:

- High gradient or steep (greater than 50%)
- Moderate gradient or moderately steep (30% to 50%)
- Low gradient (less than 30%)

CONIFER FOREST / WOODLAND

DM
BIGCONE DOUGLAS-FIR ALLIANCE

Bigcone Douglas-fir (Pseudotsuga macrocarpa) - dominated stands are found in the Transverse and Peninsular Ranges from the Mt. Pinos region south. The Bigcone Douglas-fir Alliance is defined by the clear dominance of this species among competing conifers. It has been mapped sparsely in four subsections in the Coast Section, and infrequently in seven subsections and abundantly in four subsections of the Mountains Section. These pure conifer or mixed conifer and hardwood stands occur at lower elevations, generally in the range 1400 – 5600 ft (426 - 1708 m) in the Coast Section and up to about 7000 ft (2135 m) in the Mountains Section. Although mature individuals are capable of sprouting from branches and boles after burning, intense or frequently repeated fires and drought cycles will tend to eliminate this conifer. However, Bigcone Douglas-fir may become locally dominant with Canyon Live Oak (Quercus chrysolepis) as an associated tree on protected mesic canyon slopes, but not at the highest elevations. Sites in this Alliance are usually north facing at lower elevations and south-facing or steeper slopes at upper elevations. Shrub associates commonly include species of Ceanothus, Birchleaf Mountain Mahogany (Cercocarpus betuloides), California Buckwheat (Eriogonum fasciculatum), Chamise (Adenostoma fasciculatum), and shrub forms of the Live Oaks (Quercus spp.).

DP
DOUGLAS-FIR – PINE ALLIANCE

This alliance is a combination of Bigcone Douglas-fir (Pseudotsuga macrocarpa) and Ponderosa Pine (Pinus ponderosa) that usually occurs on moderately steep slopes within an elevation range of about 3600 – 7000 ft (1098 – 2135 m) in this zone. These sites are scattered in four subsections of the Mountains Section. Canyon Live Oak (Quercus chrysolepis) is the most common hardwood associate in mixed stands. On more productive sites, this type will be mapped as a Mixed Conifer – Pine Alliance with the addition of other conifers such as Coulter Pine (P. coulteri), White Fir (Abies concolor), Sugar Pine (P. lambertiana) and Incense Cedar (Calocedrus decurrens). Less productive or recently burned sites found adjacent to this type are often occupied by hard chaparral shrubs such as Birchleaf Mountain Mahogany (Cercocarpus betuloides), shrub forms of Canyon or Interior Live Oaks (Q. c. var. nana, Q. wislizenii var. frutescens), and species of Ceanothus.

EP
EASTSIDE PINE ALLIANCE

Jeffrey Pine (Pinus jeffreyi) dominates this open forest type that is found on the transmontane side of the crests of the San Bernardino and San Gabriel Mountains in the Mountains Section. The alliance has been mapped abundantly in the Northern Transverse Ranges and Upper San Gorgonio Mountains Subsections and occasionally in five others of this section. Elevations of pure stands are in the order of 4400 - 9400 ft (1342 - 2864 m), while stands mixed with a hardwood understory are slightly lower, commonly up to 7800 ft (2378 m). Black and Canyon Live Oaks (Quercus kelloggii, Q. chrysolepis) are the most common hardwood associates. Slopes range from low to steep gradients, Canyon Live Oak often being on the steepest sites. Species of semi-arid environments such as Big Sagebrush (Artemisia tridentata) and Rabbitbrush (Chrysothamnus spp.) are associated with and define this type. It occurs adjacent to the more mesic Jeffrey Pine Alliance, which generally lacks the semi-arid understory elements. The Eastside Pine Alliance is usually found north of it in this zone, is more subject to Mojave

Occupying somewhat drier and more fire-prone sites than those of Bigcone Douglas-fir (Pseudotsuga macrocarpa), Coulter Pine has a variable expression of cone serotiny. The closed-cone habit is to some extent related to the elevation and geographic niches this species occupies. For example, stands with fully developed serotinous cones often have a chaparral understory represented by species such Mountain Whitethorn (Ceanothus cordulatus), Manzanitas (Arctostaphylos spp.), Chamise (Adenostoma fasciculatum) and shrub Interior and Canyon Live Oaks (Quercus wislizenii var. frutescens, Q. chrysolepis var. nana). Cones that open over a period of years in uneven-aged stands may be adjacent to woodland environments occupied by Coast Live Oaks (Q. agrifolia) and tree Canyon Live Oaks with the addition of California Black Oaks (Q. kelloggii) in the Mountains Section. Conifer associates in different areas include Ponderosa Pine (P. ponderosa), Bigcone Douglas-fir, and Jeffrey Pine (P. jeffreyi). Soils tend to be shallow and well drained. These trees are subject to various stresses, especially in areas of prolonged drought, where bark beetles have killed many of these pines within the last two decades.

PD
GRAY PINE ALLIANCE

Gray Pine (Pinus sabiniana) reaches its southernmost extent in Santa Barbara County and northwestern areas of Los Angeles County close to the San Joaquin Valley. It forms the dominant, and frequently only, conifer in this alliance. In the Santa Ynez Valleys and Hills Subsection of the Coast Section, this type has been mapped sparsely in the elevation range of about 1200 – 4200 ft (366 – 1280 m), and occasionally in the San Rafael-Topatopa Mountains and Northern Transverse Ranges Subsections of the Mountains Section at approximately 1000 – 5000 ft (305 -1524 m). The alliance is usually an open woodland type with a diverse mixture of trees such as Canyon Live Oak (Quercus chrysolepis), Bigcone Douglas-fir (Pseudotsuga macrocarpa) and shrubs such as Chamise (Adenostoma fasciculatum), California Buckwheat (Eriogonum fasciculatum) and Rabbitbrush (Chrysothamnus spp.).

PE
SUGAR PINE ALLIANCE

Sugar Pine (Pinus lambertiana) is one of the conifers associated with the Mixed Conifer – Pine Alliance across California. Occasionally it dominates small areas of mid-elevation slopes in this zone, being mapped sparsely in the San Rafael–Topatopa Mountains and Northern Transverse Subsections of the Mountains Section. These stands were mapped at elevations between 5400 – 6800 ft (1646 – 2074 m) and generally on moist or north-facing slopes with a history of logging or other disturbance that allow Sugar Pine's abundant seedlings to repopulate these favorable sites.

PJ
SINGLELEAF PINYON PINE ALLIANCE

Singleleaf Pinyon Pine (Pinus monophylla) dominates much of the mapped acreage in semi-arid areas in the Mountains Section. This open woodland alliance occurs most frequently in the elevation range 3000 – 9000 ft (915 – 2745 m) in transmontane regions such as northern areas of the Transverse Ranges and eastern areas of the Peninsular Ranges adjacent to the Mojave and Colorado Deserts. It is especially abundant in the Northern Transverse Ranges, San Gabriel Mountains and Little San Bernardino-Bighorn Mountains Subsections. Understories are diverse and may include the shrubs Big Sagebrush (Artemisia tridentata), Tucker or Muller Oak (Quercus john-tuckeri, Quercus cornelius-mulleri), Curlleaf Mountain Mahogany (Cercocarpus ledifolius), Boxthorn (Lycium spp.), and Desert Bitterbrush (Purshia tridentata). The shrub California Juniper (Juniperus californica) occupies sites in this type at lower elevations and often on gentle slopes or alluvium. Small trees such as Utah Juniper (Juniperus osteosperma) and Joshua Tree (Yucca brevifolia) may also occur in this Alliance.

PL
LIMBER PINE ALLIANCE

Limber Pine (Pinus flexilis), a high montane conifer of often remote locations, has a wide-ranging distribution from British Columbia and Alberta east through the Rocky Mountains to South Dakota and south to high peaks of southern California. In this zone, it occurs in scattered open stands or as individual trees above the White Fir (Abies concolor) range in southern California. It seldom occurs below 8000 ft (2438 m), appearing occasionally on the highest desert facing slopes of the Santa Rosa and San Jacinto Mountains (Mt. San Jacinto Peak) as well as higher areas of the San Gabriel and San Bernardino Mountains, such as on Mt. Baden-Powell and San Gorgonio Mountain. The trees are rarely over 30 ft (10 m) tall and may form very scattered, low krummholz or wind-trained forms at timberline. Slopes are typically high gradient and north facing. Conifers such as Lodgepole Pine (Pinus contorta ssp. murrayana) and White Fir intermix with Limber Pine. The understory is typically very sparse, occasionally including Mountain Whitethorn (Ceanothus cordulatus) or species of Manzanita (Arctostaphylos spp.).

timberline. Limber Pine is most important on exposed high slopes and ridges, where it may form small areas of pure stands in the Limber Pine Alliance. Lodgepole Pine becomes locally abundant on similar dry sites. White Fir (Abies concolor) may be present in small amounts in this mixture. This alliance is defined by the lack of clear dominance of a single conifer on these sites.

WF
WHITE FIR ALLIANCE

White Fir (Abies concolor) is considered to be a taxonomic complex of similar taxa, including the California White Fir named by some as a separate variety (var. lowiana). This common species occurs from Oregon south to Baja California and east to Colorado and New Mexico in montane forests, becoming the dominant conifer of its alliance. The White Fir Alliance has been mapped throughout the Transverse and Peninsular Ranges within eight subsections in the Mountains Section. These sites typically occur within an elevation range of about 5000 – 9000 ft (1524 - 2745 m) often on mesic or shaded slopes. White Fir readily mixes with its most frequent hardwood associate Black Oak (Quercus kelloggii), at lower elevations, below about 5600 ft (1706 m) or so, especially in the San Jacinto Mountains area of Riverside County. It associates less commonly with Canyon Live Oak (Quercus chrysolepis) up to about 7000 ft (2134 m), with Sugar Pine (Pinus lambertiana) on sunnier sites and with Coulter Pine (Pinus coulteri) at lower elevations. The White Fir Alliance is much less common in southern California than the Mixed Conifer - Fir Alliance, which is found within the same general regions and elevations, but which usually occupies steeper slopes.

WJ
WESTERN or MOUNTAIN JUNIPER ALLIANCE

The Western Juniper (Juniperus occidentalis) complex of two varieties or species occurs from southern Washington to eastern Idaho and south to southern California. It is a long-lived, slow growing conifer of harsh sites that are often nutrient-poor but which may support a subterranean water source such as a perched water table. Mountain Juniper (Juniperus occidentalis var. australis), the southern variety of Western Juniper (J. o. var. occidentalis) has recently been renamed as its own species (J. grandis) as determined from DNA comparisons of the two varieties. More common in the Sierra Nevada Mountains, this taxon occurs infrequently in this zone as a tree of dry, rocky subalpine slopes. It occasionally will dominate the tree component of a site, and has been mapped sparsely in the San Bernardino Mountains (San Gorgonio Mountains and Upper San Gorgonio Mountains Subsections) of the Mountains Section at elevations between 6600 – 9400 ft (2012 – 2867 m). White Fir (Abies concolor), Limber Pine (Pinus flexilis), and Singleleaf Pinyon Pine (Pinus monophylla) may occur within or adjacent to Mountain Juniper sites in this area.

HARDWOOD FOREST / WOODLAND

EX
COASTAL MIXED HARDWOOD ALLIANCE

This alliance of mixed hardwoods has no single dominant species but has an abundance of Coast Live Oak (Quercus agrifolia) in the mixture. These sites are very often adjacent to and include portions of mesic Black Walnut (Juglans californica) individuals in addition to minor proportions of other oaks. Lower elevation shrubs such as California Sagebrush (Artemisia californica) Lemonade berry (Rhus integrifolia), Laurel Sumac (Malosma laurina) and components of the Lower Montane Mixed Chaparral Alliance such as various species of Ceanothus, Toyon (Heteromeles arbutifolia) and Chamise (Adenostoma fasciculatum) are also spatially associated with this alliance. The Coastal Mixed Hardwood Alliance has been mapped widely but sporadically in this zone, occurring in five subsections of the Coast Section and seven in the Mountains Section at elevations generally less than about 3600 ft (1098 m).

FM
CURLLEAF MOUNTAIN MAHOGANY ALLIANCE

The tree form of Curlleaf Mountain Mahogany (Cercocarpus ledifolius) is the dominant hardwood of this alliance on dry and mostly rocky sites. This type has been mapped only rarely in the San Gorgonio Mountains and Upper San Gorgonio Mountains Subsections of the Mountains Section on xeric, upper montane elevation areas between about 6400 – 9200 ft (1952 – 2806 m). Singleleaf Pinyon Pine (Pinus monophylla) and Jeffrey Pine (P. jeffreyi) are often associated with this type. This species may live several hundred years or more in fire-resistant environments. Although shrub forms occur more commonly in this zone, the arborescent form may develop in areas having less intense fire regimes that allow mature individuals to grow into large, single-trunked specimens in old stands. Its value in providing good quality forage and winter cover for browsing animals is appreciated.

NR
RIPARIAN MIXED HARDWOOD ALLIANCE

Most perennially flowing streamside sites in southern California are not occupied by a single dominant hardwood species, but rather a mixture of deciduous trees and shrubs whose composition changes along the stream length. In this area, the Riparian Mixed Hardwood Alliance has been mapped widely in all subsections of the Mountains Section and in eight of the ten subsections of the Coast Section from Santa Barbara to San Diego Counties. Elevations are typically below 6000 ft (1830 m). The species mixture includes any combination of native obligate or facultative riparian hardwoods such as White Alder (Alnus rhombifolia), Willow (Salix spp.), California Sycamore (Platanus racemosa), Fremont or Black Cottonwood (Populus fremontii, P. balsamifera ssp. trichocarpa), Bigleaf Maple (Acer macrophyllum), Coast Live Oak (Quercus agrifolia), California Bay (Umbellularia californica), and Dogwood (Cornus spp.). A variety of riparian shrubs and perennial species may be included in this Alliance, such as California Wildrose (Rosa californica), Mugwort (Artemisia douglasiana), Baccharis spp., Rubus spp., Ribes spp., etc.

NX
INTERIOR MIXED HARDWOOD ALLIANCE

Mixtures of hardwood species in upland areas have been mapped sparsely in two subsections of the Coast Section at elevations below about 3800 ft (1158 m) and more frequently in ten subsections of the Mountains Section up to about 6000 ft (1830 m). No single species is dominant, the combination of species being variable between regions. Species include various mixtures of prominent Canyon and Interior Live Oaks (Quercus chrysolepis, Q. wislizenii), and Valley Oak (Q. lobata), with minor amounts of Black Oak (Q. kelloggii), Blue Oak (Q. douglasii), and/or Engelmann Oak (Q. engelmannii). Coast Live Oak (Q. agrifolia), Bigleaf Maple (Acer macrophyllum), and/or California Bay (Umbellularia californica) are sometimes associated with this Alliance in moist riparian environments. Conifers such as Bigcone Douglas-fir (Pseudotsuga macrocarpa) and Coulter Pine (Pinus coulteri) occasionally are present in upland sites adjacent to or within this alliance in the Mountains Section.

QA
COAST LIVE OAK ALLIANCE

Coast Live Oak (Quercus agrifolia) is considered to be the most fire-resistant California tree oak, because of its evergreen leaves, thick bark and ability to sprout from the trunk and roots from food reserves stored in an extensive root system. Two varieties are recognized: var. oxyadenia, occurring in the upper part of its elevation range in the Peninsular Ranges and Baja California and var. agrifolia at lower elevations elsewhere in this zone. It is abundant in southern and central California in coastal valleys and lower slopes of montane areas. As a dominant hardwood, this oak has been mapped throughout the Transverse, Peninsular, and South Coast Ranges at elevations from near sea level in the Coast Section to about 5000 ft (1524 m) in the Mountains Section within twenty-two subsections. These stands vary from open savanna-like grasslands in interior sites to dense forests, depending on site conditions such as climate, lithology, and slope angle. It also is a significant component of the Coastal Mixed Hardwood Alliance in combination with others such as Canyon Live Oak (Q. chrysolepis). Coast Live Oak stands intergrade with Ceanothus dominated chaparral in the Santa Ynez Mountains (Santa Barbara County). In the southern portions of the San Gabriel Mountains (Los Angeles County) this hardwood may be present with species in the California Sagebrush and Lower Montane Mixed Chaparral Alliances such as California Sagebrush (Artemisia californica), Sages (Salvia spp.), California Buckwheat (Eriogonum fasciculatum), Chamise (Adenostoma fasciculatum), and species of Rhus, Malosma, etc. In the southern Peninsular Ranges of San Diego County, Coast Live Oak sites may also include dry grasslands, Engelmann Oak (Q. engelmannii) and Lower Montane Mixed Chaparral species.

QB
CALIFORNIA BAY ALLIANCE

California Bay (Umbellularia californica), an adaptable evergreen hardwood, occurs in canyons, shaded slopes, and moist sites in chaparral and woodland communities throughout much of California. It occasionally forms scattered small stands as a tree in more protected environments when it becomes a dominant hardwood in this alliance. It also may take a more shrub-like form in exposed places and in the chaparral. The alliance has been mapped occasionally in southern California, most notably in the San Gabriel Mountains Subsection of the Mountains Section, and also in five other subsections of this section at elevations below about 5000 ft (1524 m). Coast and Canyon Live Oaks (Quercus agrifolia, Q. chrysolepis) are the most frequent hardwood associates, with Chamise (Adenostoma fasciculatum), species of Ceanothus, shrub Canyon Live, and shrub Interior Live Oaks (Q. chrysolepis var. nana, Q. wislizenii var. frutescens) being the more common shrub associates in this type.

QC
CANYON LIVE OAK ALLIANCE

Canyon Live Oak (Quercus chrysolepis), a long-lived, evergreen hardwood, is the most widely distributed California oak, growing from southwestern Oregon into Baja California and east as relict stands into Nevada and Arizona. It forms extensive pure stands throughout southern California as a tree and shrubby species on steep and often rocky canyon and mountain slopes. Its sprouting ability allows it to persist in fire-prone areas. This alliance has been mapped very abundantly or occasionally in fifteen subsections of the Mountains Section at elevations up to about 8500 ft (2593 m) and sparsely in four subsections of the Coast Section up to about 4400 ft (1342 m). The geographic distribution in this zone is also wide-ranging, enabling an association with Bigcone Douglas-fir (Pseudotsuga macrocarpa) in canyon bottoms and with Coulter Pine (Pinus coulteri) on gentle slopes or more xeric sites and with Singleleaf Pinyon Pine (P. monophylla) in transmontane semi-arid areas. Other conifer associates include Knobcone, Ponderosa, Jeffrey or Gray Pines (P. attenuata, P. ponderosa, P. jeffreyi, P. sabiniana), and White Fir (Abies concolor). In sheltered slopes and in mesic ravines closer to the coast, its hardwood associates include Madrone (Arbutus menziesii) and California Bay (Umbellularia californica), especially in Santa Barbara County. This oak often associates with Coast Live (Q. agrifolia) and Blue (Q. douglasii) Oaks in the Interior Mixed Hardwood Alliance, with tree and shrub forms of Interior Live Oak (Q. wislizenii), especially in the Transverse Ranges, and with Black Oak (Q. kelloggii) in the Peninsular Ranges. Deerbrush (Ceanothus integerrimus), Chaparral Whitethorn Ceanothus (C. leucodermis), Birchleaf Mountain Mahogany (Cercocarpus betuloides), Poison Oak (Toxicodendron diversilobum), and Manzanita (Arctostaphylos spp.) are common chaparral shrub associates.

QD
BLUE OAK ALLIANCE

Blue Oak (Quercus douglasii) is a drought-tolerant, deciduous hardwood that is endemic to California. It forms open woodlands on well-drained soils in low elevation sites throughout interior California, reaching its southernmost extent in this zone and eastward to Santa Cruz and Santa Catalina Islands in the Channel Islands. Blue Oak forms conspicuous semi-deciduous hybrids known as Alvord Oak (Q. xalvordiana) with the shrub Tucker Oak (Q. john-tuckeri).

As a pure dominant type, Blue Oak stands have been mapped sparsely in six subsections here at elevations typically in the range 600 – 4000 ft (183 – 1220 m) in both sections. Species that commonly are found in minor amounts on these sites include Coast Live Oak (Q. agrifolia), California Sagebrush (Artemisia californica) and California Buckwheat (Eriogonum fasciculatum) in addition to an herbaceous understory of annual grasses and forbs. Populations of this oak are in decline across many areas due to multiple factors, especially habitat loss from urban or rural development projects, competition from non-native grasses and forbs, drought, fire, and acorn predation and browsing on seedlings by ungulates, rodents and domestic livestock.

QE
WHITE ALDER ALLIANCE

White Alder (Alnus rhombifolia) is a short-lived, shade-intolerant deciduous riparian tree or large shrub. It has been mapped in scattered pure or nearly pure stands in the Transverse Ranges in six subsections of the Mountains Section and at one site in the Coast Section. Elevations are in the range 300 – 7000 ft (92 – 2135 m). Riparian species such as Fremont Cottonwood (Populus fremontii) and Willows (Salix spp.) are common tree associates.

QF
FREMONT COTTONWOOD ALLIANCE

Fremont Cottonwood (Populus fremontii) is a relatively long-lived, deciduous riparian tree which germinates best on newly exposed moist alluvium such as stream gravel beds. As a hardwood dominating this alliance, it has been mapped in scattered sites within twenty-one subsections of both sections in the Transverse and Peninsular Ranges at elevations below about 5600 ft (1706 m). Along with other associated trees such as California Sycamore (Platanus racemosa), White Alder (Alnus rhombifolia), Coast Live Oak (Quercus agrifolia), and Willows (Salix spp.), Fremont Cottonwood becomes a major component of the Riparian Mixed Hardwood Alliance.

QI
CALIFORNIA BUCKEYE ALLIANCE

California Buckeye (Aesculus californica), a deciduous and adaptable endemic hardwood, is mostly found on coarse-textured soils in low-elevation areas from Siskiyou to Los Angeles Counties and east to the Sierra foothills and the Mojave Desert. It is rarely found in pure stands in this zone but has been mapped very sparsely as such near the Tehachapi Mountains in the Northern Transverse Ranges Subsection of the Mountains Section. These sites are usually on north-facing, often steep, slopes at elevations between about 3900 – 4500 ft (1190 – 1373 m). Compared to surrounding sites, these canyons are relatively

moist. Canyon Live Oak (Quercus chrysolepis), Scrub Oaks (Quercus spp.) and shrubs of lower elevation such as Birchleaf Mountain Mahogany (Cercocarpus betuloides) are sometimes associated with these sites.

QK
BLACK OAK ALLIANCE

California Black Oak (Quercus kelloggii), a long-lived, deciduous upland tree, is the most important hardwood timber species in California. It is very common in mixed conifer and hardwood stands in association with Jeffrey, Ponderosa, and Coulter Pines (Pinus jeffreyi, P. ponderosa, P. coulteri), White Fir (Abies concolor), and Bigcone Douglas-fir (Pseudotsuga macrocarpa). As a dominant in hardwood stands with minor or no conifer overstory, California Black Oak has been mapped on mesic slopes at mid-montane elevations from about 3200 – 7600 ft (976 – 2318 m) in the Mountains Section. This alliance is prominent in the San Gorgonio Mountains, Upper San Gorgonio Mountains and Palomar – Cuyamaca Peak Subsections and occasionally occurs in eight other subsections in the Peninsular and Transverse Ranges. These stands often develop as a result of intensive fires or other disturbance such as logging of conifers, varying greatly in canopy closure from very dense to savanna-like. Canyon Live Oak (Q. chrysolepis) is the main hardwood associate in pure stands and with this oak in the Montane Mixed Hardwood Alliance.

QL
VALLEY OAK ALLIANCE

Valley Oak (Quercus lobata) is a large, winter-deciduous endemic tree with a round, spreading canopy, supported by (often) massive limbs and a thick bark and bole in maturity. It reaches its southernmost extent in western Los Angeles County in association with dry grasslands in open woodlands and also reaches the Channel Islands. Similar to the Blue Oak Alliance, the Valley Oak Alliance also occurs in savannas within the Santa Ynez Mountains as well as in valleys near Oak Ridge (Ventura and Los Angeles Counties). It is often found on alluvial or other sites that may retain more summer moisture than Blue Oak woodlands but its maintenance is of conservation concern due to habitat losses and other anthropogenic factors. As a dominant hardwood in this alliance, it has been mapped in scattered stands in southern California in six subsections of the Coast Section at elevations below about 4000 ft (1220 m) on low to moderate gradient slopes. The alliance has also been identified in the Mountains Section within the San Rafael – Topatopa Mountains and Northern Transverse Ranges Subsections in the elevation range of about 1000 – 4600 ft (305 – 1402 m). Associated trees in southern California include Gray Pine (Pinus sabiniana) and Coast Live Oak (Q. agrifolia).

QM
BIGLEAF MAPLE ALLIANCE

Scattered patches of Bigleaf Maple (Acer macrophyllum) have been mapped as dominants of this understory alliance within the San Gorgonio and Upper San Gorgonio Mountains Subsections of the Southern California Mountains and Valleys Section. The maple associates with upland trees such as Black Oak (Quercus kelloggii), Ponderosa Pine (Pinus ponderosa), and White Fir (Abies concolor), as well as riparian or mesic trees and shrubs such as Dogwood (Cornus spp.), California Bay (Umbellularia californica), and Roses (Rosa spp.). This Alliance has been mapped within the elevation range 4494 - 5700 ft (1370 - 1738 m).

QN
ENGELMANN OAK ALLIANCE

Engelmann Oak (Quercus engelmannii), a medium-sized, drought-deciduous to evergreen endemic tree, formerly had a relatively wide distribution throughout southeastern California, Arizona and Baja California prior to the formation of modern deserts in those areas. Taxonomically related to oaks towards the southeast (Mexican Blue – Q. oblongifolia and Arizona - Q. arizonica Oaks), Engelmann Oak is now restricted to areas of sufficient rainfall and mild climatic conditions, occurring mainly in open woodlands with a grassland or chaparral understory such as in the Organ Valley Research Natural Area (San Diego County), the Santa Rosa Plateau (Riverside County) and other areas of this zone. As a dominant hardwood in this alliance, Engelmann Oak has been mapped on one site of the Coastal Hills Subsection (Coast Section) and more prominently in the Santa Ana Mountains, Western Granitic Foothills and Palomar – Cuyamaca Peak Subsections (Mountains Section) at elevations generally below about 4200 ft (1280 m). Coast Live Oak (Q. agrifolia) is the typical additional hardwood in this alliance as well as understory shrubs and herbaceous species associated with coastal sage scrub, dry annual grasses and forbs and low-elevation chaparral. Having a limited range and subject to several stressors, Engelmann Oak stands apparently are not currently regenerating well and are a subject of conservation concern.

QO
WILLOW ALLIANCE

The Willow Alliance is defined by the dominance of any single or combination of tree species of Willow (Salix spp.), such as Black (Salix gooddingii), Red (Salix laevigata), Arroyo (Salix lasiolepis), and/or Shining (Salix lucida) Willows. It has been mapped along streambanks below 1600 ft (488 m) in the Coast Section and mainly below about 8200 ft (2501 m) in the Mountains Section. Associates may include riparian species such as Fremont Cottonwood (Populus fremontii) and California Sycamore (Platanus racemosa) and a variety of perennial and annual forbs, including invasive species such as Pampas Grasses (Cortaderia spp.). Coast Live Oak (Quercus agrifolia) is also commonly associated with this Alliance.

QP
CALIFORNIA SYCAMORE ALLIANCE

Riparian areas dominated by California Sycamore (Platanus racemosa), a fast-growing deciduous hardwood native to California and northern Baja California, occasionally were mapped in scattered areas of southern California. The California Sycamore Alliance has been identified in seven subsections of the Coast and fourteen subsections of the Mountains Sections at elevations up to about 4500 ft (1373 m). Common associates include Fremont Cottonwood (Populus fremontii), Willows (Salix spp.), Black Walnut (Juglans californica), White Alder (Alnus rhombifolia), and Coast Live Oak (Quercus agrifolia). California Sycamore sites occasionally are on lower floodplains of more xeric areas and may be adjacent to the Riversidean Alluvial Scrub Alliance in those areas.

QT
TANOAK ALLIANCE

Tanoak (Lithocarpus densiflorus) is a slow-growing, shade-tolerant evergreen hardwood that is taxonomically related to true Oaks (Quercus spp.) and Chinquapins (Chrysolepis spp. and the Asian genus Castanopsis spp.). It often occupies productive sites of deep, well-drained soils or those of shallower soils on shaded slopes. Widely distributed in coastal regions of northern and central California, Tanoak reaches its northern limits in southern Oregon and its southernmost extent in the Santa Ynez Mountains (Santa Ynez – Sulphur Mountains Subsection) in the Coast Section. It seldom occurs in pure stands in southern California but has been mapped sparsely in this area as a dominant hardwood at elevations below about 2000 ft (610 m). Slopes tend to have north-facing aspects and are moderately steep to steep. The range of Tanoak overlaps with that of Madrone (Arbutus menziesii) in this area and further north, and they may occur together in this Alliance. Other associates in southern California include coastal sage scrub species such as Sages (Salvia spp.) and California Sagebrush (Artemisia californica), hardwoods such as Coast Live Oak (Q. agrifolia) and occasionally by Bishop Pine (Pinus muricata).

QV
BLACK WALNUT ALLIANCE

California Black Walnut (Juglans californica), a species endemic to the state, historically occurred in a restricted range of southern California at elevations from 500 to 2500 ft (152 - 762 m). Due to its high value for erosion control, wildlife cover and nutritional needs, it has been planted widely up to about 3600 ft (1096 m) in this area and has been mapped as a dominant hardwood type in limited areas of the Santa Ynez – Sulphur Mountains and Simi Valley – Santa Susana Mountains Subsections of the Coast Section and in the Santa Ana Mountains Subsection of the Mountains Section. It also occurs in scattered areas of six other subsections of this zone. Walnuts are usually widely spaced and have various associates, including Coast Live Oak (Quercus agrifolia), California Bay (Umbellularia californica), Foothill Ash (Fraxinus dipetala), Mexican Elderberry (Sambucus mexicana), Sugar Bush (Rhus ovata), and Skunkbush (Rhus trilobata). Sites are usually mesic to moist such as north slopes, creek beds, seeps, canyon bottoms, and alluvial terraces with deep soils. Coastal sage scrub species such as California Sagebrush (Artemisia californica) and Black Sage (Salvia mellifera) also readily are found on Black Walnut sites.

QW
INTERIOR LIVE OAK ALLIANCE

Interior Live Oak (Quercus wislizenii), a relatively long-lived, slow-growing evergreen hardwood, is distributed in mesic areas from Siskiyou County to Baja California. In this zone, it occurs as a dominant hardwood in this alliance throughout interior valleys, slopes and foothills of the Transverse and Peninsular Ranges in eight subsections of the Mountains Section. It forms pure stands infrequently at low to intermediate elevations, especially in the San Bernardino Mountains from about 2000 - 6000 ft (610 - 1828 m) with a preference for sites with north-facing slopes. Its chaparral associates include Chaparral Whitethorn (Ceanothus leucodermis), Chamise (Adenostoma fasciculatum), Scrub Oaks (Quercus spp.), and Honeysuckle (Lonicera spp.).

QX
BLACK COTTONWOOD ALLIANCE

Black Cottonwood (Populus balsamifera ssp. trichocarpa), a shade intolerant deciduous species with a wide distribution in western North America, is maintained in riparian areas that are frequently flooded. As the dominant hardwood of this alliance, it has been mapped very sparsely in the San Rafael – Topatopa Mountains and Upper San Gorgonio Mountains Subsections of the Mountains Section at elevations up to around 8000 ft (2440 m). Fremont Cottonwood (P. fremontii) replaces it over much of southern California at lower elevation and/or warmer sites. Associated species above the floodplain of this alliance include Coast Live Oak (Quercus agrifolia), California Sagebrush (Artemisia californica), and lower elevation chaparral shrubs.

QZ
EUCALYPTUS ALLIANCE

Species of Eucalyptus: Blue Gum (Eucalyptus globulus), Red Gum (E. camaldulensis), Silver Gum (Eucalyptus polyanthemos), Forest Red Gum (Eucalyptus tereticornis) and others are now established in dense, pure stands at lower elevations, below about 3000 ft (915 m) in the Coast and Mountains Sections. These stands are widely scattered and are seldom extensive in nature, having been initially established through cultivation. Naturalization has occurred in disturbed areas, augmented by the ability of this genus to resprout after disturbance. Some of these Eucalyptus plantations are included within the Non-Native Ornamental Hardwood Alliance are typically adjacent to urban areas and annual, usually non-native grasses.

TX
MONTANE MIXED HARDWOOD ALLIANCE

This alliance of mixed hardwood species differs from the other upland types (Coastal Mixed Hardwood and Interior Mixed Hardwood Alliances) by having an abundance, but not dominance, of Black Oak (Quercus kelloggii) in the mixture. The elevation of these sites, where mapped, typically also differ with a higher general range from about 4000 – 6400 ft (1220 -1952 m), although the distrubution is more limited in this zone. It has been identified only in scattered locations in the Northern Transverse Ranges, Upper San Gabriel Mountains and San Gabriel Mountains Subsections of the Mountains Sections. These sites occur in close proximity or within the Bigcone Douglas-fir (Pseudotsuga macrocarpa), Canyon Live Oak (Q. chrysolepis), Lower Montane Mixed Chaparral, and Scrub Oak (Quercus spp.) alliances.

UD
DESERT WILLOW ALLIANCE

The Desert Willow (Chilopsis linearis) Alliance is closely related to the Smoke Tree Alliance, sharing the same species with it such as Smoke Tree (Psorothamnus spinosus), Blue Palo Verde (Cercidium floridum), Desert Ironwood (Olneya tesota), and Honey Mesquite (Prosopis glandulosa). Although sparsely mapped, areas where Desert Willow is dominant in the washes extend into several subsections under Mojave and Colorado Desert environments. This alliance has been mapped up to an elevation of about 4800 ft (1462 m) in the Mountains Section.

UJ
JOSHUA TREE ALLIANCE

Joshua Tree (Yucca brevifolia) occurs as a dominant hardwood tree in this Alliance; the species is widespread and very characteristic of the Mojave Desert. This alliance has been mapped abundantly in the Little San Bernardino - Bighorn Mountains Subsection, and very sparsely in five other subsections of the Mountains Section. It generally occurs within the elevation range 3200 - 5800 ft (974 - 1768 m) on low-gradient and often north-facing slopes and alluvial fans in this region. Other species included as associates in this Alliance are Singleleaf Pinyon Pine (Pinus monophylla), California and Utah Junipers (Juniperus californica, Juniperus osteosperma), Teddybear Cholla (Opuntia bigelovii), Creosote Bush (Larrea tridentata), Muller Oak (Quercus cornelius-mulleri), Boxthorn (Lycium spp.), Cottonthorn (Tetradymia spp.), and Mormon Tea (Ephedra spp.).

UL
CATCLAW ACACIA ALLIANCE

Catclaw Acacia (Acacia greggii) is the dominant hardwood of this alliance, indicative of arid Mojave Desert sandy or gravelly washes and arroyos and other arid interior environments. It has been mapped in scattered stands of the Mountains Section at low to mid-elevations, mainly within 400 – 4400 ft (122 – 1342 m) on low-gradient slopes such as alluvial slopes and terraces. Species such as Smoketree (Psorothamnus spinosus), Sweetbush (Bebbia juncea), Burrobush (Hymenoclea salsola), Desert Lavender (Hyptis emoryi), and Mojave Rabbitbrush (Chrysothamnus paniculatus) may be associated with this Alliance.

frequently, California Juniper (Juniperus californica) are also likely to be found on these sites. The majority of mapped areas occur below 5000 ft (1524 m) on most slope gradients and aspects.

AX
ALPINE MIXED SCRUB ALLIANCE

Alpine flora in southern California is relatively poor in extent, but does occur on a few higher peaks. It has been mapped very sparsely on the higher ridges and slopes of San Gorgonio Mountain (San Bernardino County) above about 7600 ft (2318 m). A mixture of grasses, herbaceous plants, and often prostrate subshrubs occur on these short-season, exposed sites. Rounded, low-profile xerophytic plant forms ("cushion plants") such as Southern Alpine Buckwheat (Eriogonum kennedyi var. alpigenum) occur with other subshrubs and taller shrubs such as Sulfur Flower Buckwheat (Eriogonum umbellatum), Rock Spiraea (Holodiscus microphyllus), Wax currant (Ribes cereum), Mountain Gooseberry (Ribes montigenum), Purple Mountainheath (Phyllodoce breweri), Red Elderberry (Sambucus racemosa), and shrub Willows such as Geyer's (Salix geyeriana) and Lemmon's (Salix lemmonii). Perennials such as Draba corrugata, Silky Raillardella (Raillardella argentea), Campion (Silene parishii), Pussypaws (Calyptridium monospermum), Alpine Shooting Star (Dodecatheon alpinum), Buttercup (Ranunculus eschscholtzii var. oxynotus), Pumice Alpinegold (Hulsea vestita) as well as grasses and graminoid species such as Needlegrass (Achnatherum occidentale), Squirreltail (Elymus elymoides), Rushes (Juncus spp.), and Sedges (Carex spp.) may also be prominent in this Alliance.

BC
SALTBUSH ALLIANCE

Fourwing Saltbush (Atriplex canescens) is considered to be the most widely distributed native woody species in North America, naturally occurring from southern Alberta south to central Mexico and from the Pacific coast east to the Missouri River. It exhibits extreme genetic diversity and adaptability across its natural range. As it is salt, cold and drought resistant, Fourwing Saltbush has been widely planted as an ornamental, spreading as naturalized populations to areas east of the Great Plains grasslands. In this zone of southern California, it has been mapped as the typical Saltbush species in this native Saltbush Alliance. These sites have been identified widely but sparsely in five subsections of the Mountains Section at elevations below about 6800 ft (2074 m). Creosote Bush (Larrea tridentata), Brittlebush (Encelia farinosa) and Mesquite (Prosopis spp.) are commonly associated shrubs.

BM
CURLLEAF MOUNTAIN MAHOGANY ALLIANCE

Curlleaf Mountain Mahogany (Cercocarpus ledifolius), a large shrub or small tree, has a wide distribution pattern from the Cascade Range in Washington east to Montana, Wyoming and Colorado and south through semiarid areas of California and Arizona to Baja California. As the variety intermontanus in this zone, it is the dominant shrub of this alliance on harsh, transmontane upper montane slopes. This alliance has been mapped in scattered locations in the Upper San Gorgonio Mountains Subsection and four others in the Mountains Section within the elevations of about 4600 – 9400 ft (1402 – 2867 m). Conifers such as Singleleaf Pinyon Pine (Pinus monophylla) and Jeffrey Pine (Pinus jeffreyi) and shrubs of semiarid environments such as Big Sagebrush (Artemisia tridentata), Rubber Rabbitbrush (Chrysothamnus nauseosus) and Mojave Ceanothus (C. greggii var. vestitus) are typically found within or adjacent to these sites.

BQ
GREAT BASIN MIXED SCRUB ALLIANCE

This type is defined by at least three common shrubs more characteristic of the Great Basin and Mojave Desert xeric environments to the northeast of this area. The mixture includes any combination of Big Basin Sagebrush (Artemisia tridentata var. tridentata), Bitterbrush (Purshia tridentata), Tucker's and/or Muller's Scrub Oaks (Quercus john-tuckeri, Q. cornelius-mulleri), Curlleaf Mountain Mahogany (Cercocarpus ledifolius), Rabbitbrush (Chrysothamnus spp.) and others such as interior Buckwheats (Eriogonum spp.) where none achieve dominance. The Great Basin Mixed Scrub type has been mapped abundantly in northerly sections of the Northern Transverse Ranges, Little San Bernardino – Bighorn Mountains and occasionally in four other subsections of the Mountains Section at elevations between about 2800 – 7800 ft (854 – 2379 m) in this zone.

BR
RABBITBRUSH ALLIANCE

Rubber Rabbitbrush and Stickyleaf Rabbitbrush (Chrysothamnus nauseosus, C. viscidiflorus) occur in California south to Riverside County. The Rabbitbrush Alliance is dominated by either, both or other species in this genus. It has been mapped abundantly in the Northern Transverse Ranges and occasionally in ten other subsections of the Mountains Section on dry slopes and flats within a wide elevation range of about 2600 – 8800 ft (792 – 2684 m). These sites often have been recently

burned or have undergone other disturbances such as livestock overgrazing on rangelands, road construction, landslides and the like. Stickyleaf Rabbitbrush has a more restricted range in this area and has not been found on alkaline soils. The more commonly occurring Rubber Rabbitbrush may grow on strongly alkaline as well as more neutral soils. In semiarid areas, associated species of this alliance include Singleleaf Pinyon Pine (Pinus monophylla), California Juniper (Juniperus californica), Bitterbrush (Purshia tridentata var. glandulosa), Big Sagebrush (Artemisia tridentata), Flannel Bush (Fremontodendron californicum ssp. californicum), Desert Almond (Prunus fasciculata), and many other shrubs.

BS
BIG SAGEBRUSH ALLIANCE

Big Sagebrush (Artemisia tridentata) dominates semiarid sites in much of the western United States. In southern California, the Big Sagebrush Alliance, identified mainly by the dominance of Artemisia tridentata ssp. tridentata and/or A. t. ssp. vaseyana, is found in dry interior and transmontane locations. These sites occur within a range of elevations and habitats where slopes are of low gradient and soils are coarse, often deep, and well drained. Typical sites are dry alluvial fans or washes. The alliance has been identified in the Mountains Section from southwestern Kern to southern San Diego Counties and mapped abundantly in the Little San-Bernardino – Bighorn Mountains and San Jacinto Foothills – Cahuilla Mountains Subsections and occasionally in twelve others. Elevations of these sites are in the range of about 1800 – 9200 ft (548 – 2806 m). Species associated with the Big Sagebrush Alliance include conifers such as Jeffrey Pine (Pinus jeffreyi), Singleleaf Pinyon Pine (Pinus monophylla), and dryland and low-elevation chaparral shrubs such as California Juniper (Juniperus californica), Rabbitbrush (Chrysothamnus spp.), Tucker's or Muller's Oaks (Quercus john-tuckeri, Q. cornelius-mulleri), California Buckwheat (Eriogonum fasciculatum), Red Shank (Adenostoma sparsifolium), Chamise (A. fasciculatum), and Manzanitas (Arctostaphylos spp.), and grasses such as Bromus spp.

BX
GREAT BASIN - MIXED CHAPARRAL TRANSITION ALLIANCE

This mixed chaparral to semiarid transitional type is indicated by combinations of dryland shrubs such as Big Sagebrush (Artemisia tridentata), Tucker's or Muller's Oaks (Quercus john-tuckeri, Q. cornelius-mulleri), Rabbitbrush (Chrysothamnus spp.), coupled with more mesic chaparral species such as Mountain Whitethorn (Ceanothus cordulatus), and Manzanitas (Arctostaphylos spp.). Minor amounts of Jeffrey Pine and Singleleaf Pinyon Pine may also be found in this alliance. It occurs principally in the transmontane areas of the San Gabriel Mountains and Northern Transverse Ranges Subsections of the Mountain Section, as well as occasionally in ten other subsections. Slopes are generally desert or south facing, with moderately steep to steep gradients. Most sites fall within elevations from about 1800 – 8800 ft (548 – 2684 m).

BZ
GREAT BASIN – DESERT MIXED SCRUB ALLIANCE

Great Basin species such as Big Sagebrush (Artemisia tridentata), Bitterbrush (Purshia tridentata) and Curlleaf Mountain Mahogany (Cercocarpus ledifolius) and more southerly Mojave desert species such as Saltbush (Atriplex spp.), Mormon Tea (Ephedra nevadensis, E. viridis), Creosote Bush (Larrea tridentata) and Horsebrush (Tetradymia glabrata, T. stenolepis) occur together in this type. This transitional alliance consists of representatives of these two groups occurring with equivalent abundance (cover) values. Such sites have been mapped within the elevation range of about 2400 – 6200 ft (732 – 1890 m) on desert-facing slopes of interior subsections of the Mountains Section. Associated by proximity to or within this alliance are Singleleaf Pinyon Pine (Pinus monophylla), Tucker's or Miller's Oaks (Quercus john-tuckeri, Q. cornelius-mulleri), California Juniper (Juniperus californica) and shrubs in the Desert Mixed Scrub Alliance.

CA
CHAMISE ALLIANCE

Chamise (Adenostoma fasciculatum), a shade-intolerant, relatively long-lived but fire-sensitive evergreen shrub, is considered to be the most characteristic and widely distributed chaparral species in California's foothills and coastal mountains. As a dominant shrub identifying this alliance, it often develops on sites that are harsher in terms of having shallow soils, recent fire disturbance, or having more xeric or sunnier environments (e.g., south facing slopes) than the adjacent Lower Montane Mixed Chaparral Alliance. Chamise appears to be affected by extreme winter temperatures, which limits its distribution in colder climates to the north and east, its natural range being from Mendocino County to Baja California, east to the Sierra Nevada foothills and west to the Channel Islands. This type has been mapped extensively in the Coast and Mountains Sections within twenty-four subsections, occupying most aspects and slope gradients. The elevation of these sites are generally below about 4800 ft (1464 m) in the Coast Section, and somewhat higher in interior sites of the Mountains Section. It grades into the Redshank (Adenostoma sparsifolium) Alliance in the Palomar Mountains in San Diego County and areas near the San Jacinto Mountains of Riverside County and elsewhere with the California Buckwheat (Eriogonum fasciculatum) and Annual Grasses

and Forbs Alliances. Very little other vegetation is found on these sites but Chaparral Yucca (Yucca whipplei) often occurs on more open sites and Coast Live Oak (Quercus agrifolia) is sometimes present in the immediate vicinity.

CC
CEANOTHUS CHAPARRAL ALLIANCE

Southern California chaparral is occasionally dominated in small areas by species of Ceanothus in contrast to the more extensively occurring mixed genera chaparrals. The Ceanothus Chaparral Alliance has been mapped extensively at low to mid elevations. This Alliance is identified by any of the following dominant or combinations of species: Hoaryleaf Ceanothus (Ceanothus crassifolius) and Wedgeleaf Ceanothus (Ceanothus cuneatus) in the western portions of the Transverse Ranges (Ventura and Los Angeles Counties), northern Peninsular Ranges and Santa Ana Mountains of San Diego and Riverside Counties; Cupleaf or Mojave Ceanothus (Ceanothus greggii var. perplexans, C. g. var. vestitus) in the eastern Transverse Ranges (San Bernardino County) and Peninsular Ranges of San Diego and Riverside Counties; Chaparral Whitethorn (Ceanothus leucodermis) forming dense post-fire stands in many areas, and Greenbark Ceanothus (Ceanothus spinosus). Other species in this Alliance include Hairy Ceanothus (Ceanothus oliganthus) in the western Transverse Ranges and Santa Ana Mountains, Woolyleaf Ceanothus (Ceanothus tomentosus) in the Santa Ana Mountains and Peninsular Ranges, and Bigpod Ceanothus (Ceanothus megacarpus) nearer the coast in the western Transverse Ranges. Sites range from mesic and coastal (Bigpod Ceanothus) to xeric (Cupleaf Ceanothus) with elevations ranging from near sea level in the Coast Section to about 6000 ft (1828 m) in the Mountains Section. Chamise (Adenostoma fasciculatum) occurs throughout this area and is commonly associated with these species.

CD
SOUTHERN MIXED CHAPARRAL ALLIANCE

The Southern Mixed Chaparral Alliance was named and cited by Robert F. Holland in 1986 and subsequently became a "Holland type" used by state agencies. It was considered to be a type transitional from southern California chaparral to the "coastal semi-desert of Baja California Norte". In the present Calveg definition, it contains mixtures of fully woody and sometimes semi-woody, low-elevation chaparral and coastal sage scrub species in areas having somewhat lower precipitation and more moderate temperatures than in the Lower Montane Mixed Chaparral Alliance, which is often contiguous to it in San Diego and Riverside Counties. It is found in coastal foothills and further inland in the Coast Section at elevations usually between sea level and about 2200 ft (671 m) and in the Mountains Section at elevations up to about 3200 ft (976 m) on most slopes and aspects. There is usually no single dominant species, the indicator chaparral shrubs being Woolyleaf Ceanothus (Ceanothus tomentosus) or Mission Manzanita (Xylococcus bicolor). Both of these evergreen shrubs are distributed from Baja California northward into this zone, the Ceanothus also occurring in the Sierra Nevada foothills, possibly as variety C. t. var. tomentosus and confined to this zone as Ramona Lilac, C. t. var. olivaceus. Minor amounts of Chamise (Adenostoma fasciculatum) and Scrub Oak (Quercus berberidifolia) are often present in this Alliance. California Sagebrush Alliance species such as Purple and Black Sages (Salvia leucophylla, Salvia mellifera), California Sagebrush (Artemisia californica), Laurel Sumac (Malosma laurina), and Lemonade Berry (Rhus integrifolia) may be prominent in this Alliance.

CK
COYOTE BRUSH ALLIANCE

Coyote Brush (Baccharis pilularis), a relatively short-lived, shade-intolerant and versatile shrub, occurs along the coast ranges from Tillamook County, Oregon, south to the Channel Islands, San Diego County and Baja California and east to the foothills of the Sierra Nevada and California Cascades Mountains. Coastal populations exposed to saltspray and wind tend to have prostrate forms while inland, higher elevation specimens are usually erect and could grow up to about 12 ft (3.7 m) in height. It dominates this alliance in mixture with other species such as California Sagebrush (Artemisia californica), Coast Live Oak (Quercus agrifolia), and annual species of grasses such as Bromus spp. This type has been mapped at elevations generally below about 2400 ft (732 m) in the San Rafael - Topatopa Mountains Subsection (Mountains Section), and the Santa Ynez - Sulphur Mountains, Oxnard Plain – Santa Paula Valley and Simi Valley-Santa Susana Mountains Subsections (Coast Section). Coyote Brush appears to develop as a dominant shrub in this area on well-drained soils deeper than those supporting California Sagebrush sites. Coffeeberry (Rhamnus californica), Poison Oak (Toxicodendron diversilobum) and Orange Bush Monkeyflower (Mimulus aurantiacus) are other shrub associates in this area.

CL
WEDGELEAF CEANOTHUS ALLIANCE

Wedgeleaf Ceanothus (Ceanothus cuneatus) is an evergreen shrub of diverse habitats expressed in three varieties distributed across California and Baja California. As a dominant shrub, it defines this alliance and may dominate low elevation sandy coastal habitats in the Coast Section such as in westernmost Santa Barbara County within 500 ft (153 m) of sea level. More commonly, this type is found in shrub and woodland areas, having been mapped sparsely in the Mountains Section at

elevations up to around 5400 ft (1646 m). In those sites, its associated trees and shrubs are often semiarid species such as Big Sagebrush (Artemisia tridentata), Jeffrey Pine (Pinus jeffreyi) and Singleleaf Pinyon Pine (P. monophylla).

CQ
LOWER MONTANE MIXED CHAPARRAL ALLIANCE

The Lower Montane Mixed Chaparral Alliance occurs extensively on cismontane low to moderately high elevation slopes in southern California. It has been mapped with greater acreage than other alliance in this zone. The species mixture is highly variable across this diverse area and includes any combination of non-dominant Wedgeleaf (Ceanothus cuneatus), Cupleaf (Ceanothus greggii perplexans), Hoaryleaf (Ceanothus crassifolius), or Hairy Ceanothus (Ceanothus oliganthus); non-dominant Scrub Oak (Quercus berberidifolia), Bigberry (Arctostaphylos glauca), Eastwood (Arctostaphylos glandulosa), or other species of Manzanita (Arctostaphylos spp.), Toyon (Heteromeles arbutifolia), Chaparral Yucca (Yucca whipplei), Silktassel (Garrya spp.), California Buckwheat (Eriogonum fasciculatum), Chaparral Whitethorn (Ceanothus leucodermis), Sugar Bush (Rhus ovata), shrub Interior and Canyon Live Oaks (Quercus wislizenii, Quercus chrysolepis), Hollyleaf Redberry (Rhamnus ilicifolia) and Hollyleaf Cherry (Prunus ilicifolia). Chamise (Adenostoma fasciculatum) is usually abundant but not dominant in this Alliance. In the Coast Section, it has been mapped at elevations from sea level to around 5400 ft (1646 m), and up to about 8000 ft (2440 m) in the Mountains Section. Higher elevation sites typically have more prominent shrubby live oaks, which often resprout quickly after fires. The transformation from erect hardwoods to shrubs tends to raise this alliance into upper montane environments. Slope aspects and gradients are variable in this type.

CR
REDSHANK ALLIANCE

Redshank (Adenostoma sparsifolium), an evergreen shrub of restricted range, forms open and often pure stands in several discrete populations in central and southern California. Locations are usually at least 50 miles (80 km) inland from the coast. Chamise (Adenostoma fasciculatum), a common associate, may be prominent but is not clearly dominant in this alliance and generally occurs on drier or less productive microsites than the adjoining Redshank areas. In the Mountains Section, these stands have been mapped in areas of the Peninsular Ranges adjacent to Colorado Desert climatic influences such as in the rainshadow of the Palomar Mountains of San Diego County and south of the San Jacinto Mountains of Riverside County at elevations below about 6500 ft (1983 m). Locations mapped in the Coast Section are below about 3400 ft (1036 m). Slope gradients and aspects are variable and soils may be shallow but usually well-drained. Birchleaf Mountain Mahogany (Cercocarpus betuloides) and other drought-adapted species such as Muller Oak (Quercus cornelius-mulleri), Chaparral Yucca (Yucca whipplei), and Cupleaf or Desert Ceanothus (Ceanothus greggii) may also be present at low densities.

CS
SCRUB OAK ALLIANCE

Scrub Oak (Quercus berberidifolia) or other species of shrubby oaks may become dominant on north facing and often steep, mesic slopes at low to moderately high elevations in southern California. The Scrub Oak Alliance has been mapped extensively in the Mountains Section within sixteen subsections, and less frequently in the Coast Section in six subsections. These elevations are as low as near sea level and as high as about 9000 ft (2745 m). Any combination of Scrub Oak, Alvord Oak (Q. x alvordiana), Tucker or Muller Shrub Oak (Q. john-tuckeri, Q. cornelius-mulleri), Shrub Interior Live Oak (Q. wislizenii var. frutescens), Brewer Oak (Q. garryana var. breweri), Leather Oak (Q. durata), various shrub oak hybrids, and shrub Canyon Live Oak (Q. chrysolepis var. nana) may be present in this Alliance. Common chaparral associates are the shrubs Chamise (Adenostoma fasciculatum), Birchleaf Mountain Mahogany (Cercocarpus betuloides), Toyon (Heteromeles arbutifolia), species of Ceanothus, Sumacs (Rhus spp.), and Manzanita (Arctostaphylos spp.). In drier areas closer to the distribution of Tucker and Muller Oak, Redshank (Adenostoma sparsifolium), California Juniper (Juniperus californica), Singleleaf Pinyon Pine (Pinus monophylla), and Big Sagebrush (Artemisia tridentata) may associate with species of this alliance. Vines such as Poison Oak (Toxicodendron diversilobum), Cucumber Vine (Marah macrocarpus), and Honeysuckle (Lonicera spp.) also are common in mesic sites.

CT
TUCKER / MULLER SCRUB OAK ALLIANCE

This alliance is identified by the occurrence of either Tucker or Muller Oaks (Quercus john-tuckeri, Q. cornelius-mulleri) singly or in combination to form the dominant taxa of this semiarid shrub type. As they both have restricted ranges and similar taxonomic affiliations, they are considered together. Muller Oak occurs further east, where it is found on dry washes and slopes along interior Mojave or Colorado Desert or Great Basin margins in San Bernardino, Riverside and San Diego Counties. Associated species include Big Basin Sagebrush (Artemisia tridentata var. tridentata), Singleleaf Pinyon Pine (Pinus monophylla) and Junipers (Juniperus spp.). Tucker Oak occupies similar xeric habitats further north and west, including occurrences along the edges of the Tehachapi Mountains, slopes of the San Gabriel Mountains, etc. Both species appear to be

LS
SCALEBROOM ALLIANCE

Drainages of intermittent streams and washes in interior locations of the Mountains and Coastal Sections may be dominated by Scalebroom (Lepidospartum squamatum) in the vicinity of sandy and coarse-textured alluvial fans in this alliance. Greenbroom (L. latisquamum) is also a component of this alliance, occurring more locally on limestone areas in the San Gabriel Mountains and other northern subsections. The alliance has been mapped sparsely on low-gradient slopes in four subsections of the Coast Section at elevations below about 1500 ft (458 m) but is more widespread in scattered areas of eleven subsections of the Mountains Section at elevations up to about 5400 ft (1646 m). Scalebroom-dominated washes in western Mojave fringe areas have considerable winter and spring hydric flows and are closely related in site preference to the more abundant Riversidean Alluvial Scrub Alliance in these areas. Scalebroom associates with shrubs and subshrubs of mesic environments such as California Sagebrush (Artemisia californica) as well as those of xeric habitats such as Brittlebush (Encelia farinosa), Creosote Bush (Larrea tridentata), Chaparral Yucca (Y. whipplei), Rabbitbrush (Chrysothamnus nauseosus) and Big Sagebrush (Artemisia tridentata). Riparian hardwoods such as Fremont Cottonwood (Populus fremontii) and Desert Willow (Chilopsis linearis) may occur on or adjacent to these sites.

ML
BACCHARIS (RIPARIAN) ALLIANCE

This riparian or dry wash alliance is dominated by any species of Baccharis occupying wet habitats, including the most common, Mule Fat (B. salicifolia), Desert Baccharis (B. sergiloides), Shortleaf Baccharis (B. brachyphylla), Marsh Baccharis (B. douglasii), Broom Baccharis (B. sarothroides), and Emory Baccharis (B. emoryi). Tree willows (Salix spp.), California Sycamore (Platanus racemosa), Fremont Cottonwood (Populus fremontii), and Coast Live Oak (Quercus agrifolia) are some associated hardwoods in this Alliance. It has been mapped within seventeen subsections in this zone. Elevations are below 2000 ft (610 m) or so in the Coast Section and within the elevation range 200 - 4400 ft (60 - 1340 m) in the Mountains Section on low gradient slopes.

NA
ALKALINE MIXED SCRUB ALLIANCE

More extensively mapped in the South Interior Calveg zone, this alliance has been identified here with some frequency along the northeastern border of the Desert Slopes Subsection west of the Salton Sea in the Mountains Section. These sites occur within the elevation range of about 100 – 2600 ft (31 – 793 m), mostly within alkaline or saline interior drainage basins. These xeric areas are associated with shrubs such as Creosote Bush (Larrea tridentata), Saltbush (Atriplex spp.), Bursage (Ambrosia dumosa), Brittlebush (Encelia farinosa) and Indigo Bush (Psorothamnus spp.). Trees such as Palo Verde (Cercidium spp.) and Smoke Tree (Psorothamnus spinosa) may also occur near or on these sites.

NB
DESERT MIXED WASH SCRUB ALLIANCE

This alliance occupies desert washes and intermittent drainages and is not dominated by a single species. These environments are physically and botanically diverse, depending on factors such as the episodic nature of local water flows, disturbances by scouring, elevation, fire history, proximity to seed sources and the like. It has been mapped sparsely to prominently in five subsections of the Mountains Section on low-gradient slopes below about 4600 ft (1402 m). The shrub mixture includes non-dominant Cheesebush (Hymenoclea salsola), Saltbush (Atriplex spp.), Indigo Bush (Psorothamnus schottii), Bush Seepweed (Suaeda moquinii), Desert Lavender (Hyptis emoryi), Desert Agave (Agave deserti), non-dominant Greasewood (Sarcobatus vermiculatus), and Alkali Heath (Frankenia salina). Herbaceous species such as Alkali Sacaton (Sporobolus airoides), Saltgrass (Distichlis spicata), and/or Pickleweed (Salicornia spp.) may also be found on these sites. Trees that may be adjacent to or included in minor amounts in this type include Mesquite (Prosopis spp.), Smoke Tree (Psorothamnus spinosa), Palo Verde (Cercidium spp.) and/or Desert Willow (Chilopsis linearis).

NM
RIPARIAN MIXED SHRUB ALLIANCE

A community of mixed shrubs has been mapped in low elevation riparian and moist meadow sites over widespread areas of this zone. This type is represented in six subsections of the Coast Section and seven in the Mountains Section at elevations below about 3600 ft (1098 m). Shrubs in this mixture include species of shrub Willow (Salix spp.), Elderberry (Sambucus spp.), and Wild Rose (Rosa spp.) and occasionally Mule Fat (Baccharis spp.). The Riparian Mixed Shrub Alliance is most often found adjacent to annual grasses and forbs, California Sagebrush (Artemisia californica), Coast Live Oak (Quercus agrifolia), hardwoods of the Riparian Mixed Hardwood Alliance, and urban landscapes.

NQ
HIGH DESERT MIXED SCRUB ALLIANCE

The "High Desert" in this region is defined loosely as mid-montane Mojave Desert elevations that are generally above those of the warmer and presumably more xeric Desert Mixed Shrub Alliance, which is often found in close proximity to this type. These sites are characterized by indicator species such as Blackbush (Coleogyne ramosissima), Mormon Tea (Ephedra spp.), Hopsage (Grayia spinosa), Anderson Boxthorn (Lycium andersonii), Spiny Menodora (Menodora spinescens), White Bursage (Ambrosia dumosa) and Cacti species (Opuntia spp.). Creosote Bush (Larrea tridentata) is generally absent. This type has been mapped in the Little San Bernardino – Bighorn Mountains and three other subsections of the Mountains Section. Elevations range from about 3100 – 6500 ft (946 – 1983 m). Other species found adjacent to these sites include California Juniper (Juniperus californica), Singleleaf Pinyon Pine (Pinus monophylla), Muller Scrub oak (Quercus cornelius-mulleri) and Brittlebush (Encelia farinosa).

RS
RIVERSIDEAN ALLUVIAL SCRUB ALLIANCE

Alluvial fans and dry washes in xeric, interior areas of the Montane Section close to developed areas may contain a mixture of species, of which Scalebroom (Lepidospartum squamatum), California Buckwheat (Eriogonum fasciculatum), California Sagebrush (Artemisia californica), White Sage (Salvia apiana), and Encelia spp., may be prominent. Since the history of ground disturbance is a factor in the species composition of the Riversidean Alluvial Scrub Alliance, other species may also occur, including Opuntia spp., Chaparral Yucca (Yucca whipplei), Rhus spp., and California Juniper (Juniperus californica). It has been mapped as patchy areas of San Bernardino and Riverside Counties at elevations up to about 5000 ft (1524 m) on low-gradient slopes. In the Coast Section, where the alliance has also been mapped, these sites are usually sandy washes with episodic flood patterns. In species composition and geographic proximity, the Riversidean Alluvial Scrub Alliance merges with the California Buckwheat and California Sagebrush Alliances and takes its name from a type named by Robert Holland ("Holland type") in the mid-1980s.

SB
BUCKWHEAT ALLIANCE

The combination of California Buckwheat (Eriogonum fasciculatum) with or unaccompanied by White Sage (Salvia apiana), form the dominant components of this interior alliance. It has been mapped very frequently in scattered locations in fifteen subsections of the Mountains Section at elevations up to about 7000 ft (2135 m) and much less abundantly in five subsections of the Coast Section. Chaparral Yucca (Yucca whipplei), Encelia spp., Cholla and Prickly Pear (Opuntia spp.), Sumacs (Rhus and Malosma species), and Deerweed (Lotus scoparius) are often present but Chamise (Adenostoma fasciculatum) is not prominent in this xeric Alliance. The sites are often sparsely vegetated and with good drainage. The degradation of Chamise or mixed chaparral sites from past fires or other surface or subsurface disturbance patterns appear to initiate and perpetuate many of these Buckwheat communities.

SD
MANZANITA CHAPARRAL ALLIANCE

The dominance of the shrub layer by single or multiple species of Manzanita (Arctostaphylos spp.) define this alliance. It is prominent in two subsections, chiefly on military lands, of the Coast Section at elevations below about 3000 ft (915 m) in low-gradient areas. Species in this region include clusters of several coastal endemics or rare species in western and southern areas of Santa Barbara County such as La Purissima Manzanita (Arctostaphylos purissima), Sand Mesa Manzanita (Arctostaphylos rudis), Woolyleaf Manzanita (Arctostaphylos tomentosa), and Refugio Manzanita (Arctostaphylos refugioensis). Associated species include California Sagebrush (Artemisia californica), Coast Live Oak (Quercus agrifolia), annual grasses and forbs and an occasional Mule Fat (Baccharis spp.). The Manzanita Chaparral Alliance has also been mapped in scattered areas of ten subsections in the Mountains Section, where it occurs at elevations from about 2200 – 8000 ft (671 – 2440 m) and includes such species as Greenleaf (Arctostaphylos patula), Parry (Arctostaphylos parryana), Bigberry (Arctostaphylos glauca), Eastwood (Arctostaphylos glandulosa), Mexican (Arctostaphylos pungens), and Pink-Bract Manzanita (Arctostaphylos pringlei spp. drupacea).

SE
ENCELIA SCRUB ALLIANCE

This Alliance is dominated by either the shrubs Brittlebush (Encelia farinosa) and/or Acton's Brittlebush (E. actoni), tolerant of arid environments in the coast or desert and/or the more coastal California Encelia (Encelia californica). The Encelia Scrub Alliance is uncommon in the Coast Section and has been mapped mainly on south-facing slopes and coastal bluffs of low to moderate gradients below about 600 ft (183 m) in the Los Angeles Plain Subsection. The associated species include California Sagebrush (Artemisia californica), California Buckwheat (Eriogonum fasciculatum), Coast Cactus (Opuntia littoralis), and

Lemonade berry (Rhus integrifolia). The more frequent occurrence of Brittlebush in arid environments of the Mountains Section tends to be on mid to high gradient slopes at elevations up to about 5000 ft (1524 m). Associated shrubs in this section include those of desert affinities such as Creosote Bush (Larrea tridentata), White Bursage (Ambrosia dumosa), and California Juniper (Juniperus californica).

SH
COASTAL BLUFF SCRUB ALLIANCE

Remnants of this formerly more widespread coastal Alliance are found in scattered and exposed preserves of San Diego County and elsewhere in the Coast Section. It has been mapped infrequently below 600 ft (182 m) on low-gradient slopes in this area. Indicator species include Saltbush (Atriplex spp.), Sea-Dahlia (Coreopsis maritima), California Encelia (Encelia californica), Heather Goldenbush (Ericameria ericoides), Cucumber Vine (Marah macrocarpus), Coast Prickly Pear (Opuntia littoralis), Shaw's Agave (Agave shawii), and Lemonade berry (Rhus integrifolia) and non-natives such as Fig Marigold (Carpobrotus chilensis and Carpobrotus edulis), and Iceplant (Mesembryanthemum crystallinum). Other species often found in this Alliance include Morning Glory (Calystegia spp.), Indian Paintbrush (Castilleja spp.), Fleabane Daisy (Erigeron spp.), Wooly Sunflower (Eriophyllum spp.), and Spineflower (Chorizanthe spp.).

SL
COASTAL LUPINE ALLIANCE

Dune Lupine (Lupinus chamissonis), a California native, is an indicator species in coastal dunes in extreme northwestern Santa Barbara County for this Alliance. It may or may not become the dominant shrub in these vegetated dunes, but is generally present in the general area. The stabilized coastal dune habitat supports other species there, including non-natives such as Fig Marigolds (Carpobrotus chilensis and Carpobrotus edulis), Iceplants (Mesembryanthemum crystallinum and Mesembryanthemum nodiflorum) and herbaceous annuals such as New Zealand Spinach (Tetragonia tetragonioides). Other associated perennials, shrubs and subshrubs include Heather Goldenbush (Ericameria ericoides), California Sagebrush (Artemisia californica), Giant Woollystar (Eriastrum densifolium), Dune Buckwheat (Eriogonum parvifolium), California Croton (Croton californicus), Common Deerweed (Lotus scoparius), Sand Verbena (Abronia latifolia), Dune Senecio (Senecio blochmaniae), California-Aster (Lessingia filaginifolia), and perennial graminoids such as Carex spp. and Bromus spp.

SM
SUMAC SHRUB ALLIANCE

This alliance is dominated by species of Rhus or Malosma. Associated hardwoods include Coast Live Oak (Quercus agrifolia) and California Walnut (Juglans californica). In the Coast Section, it occurs abundantly in the Santa Monica Mountains Subsection and occasionally in six others below about 4000 ft (1220 m) on moderate to steep slopes. Laurel Sumac (Malosma laurina) and Lemonade berry (Rhus integrifolia) are important components in this region. The occurrence of the Sumac Shrub Alliance in the Mountains Section is more often on steep slopes below about 4400 ft (1342m) in twelve subsections, where it has been mapped occasionally. Sugar bush (Rhus ovata) is characteristic of those sites. Skunkbush (Rhus trilobata) may be present, but rarely becomes an important component. Other species often found in this type are California Sagebrush (Artemisia californica), and annual grasses and forbs.

SO
COASTAL CACTUS ALLIANCE

Drier areas of the coastal plain may be dominated by any combination of species of Opuntia, including Coast or Tall Coast Prickly Pears (Opuntia littoralis, Opuntia oricola) and Bluff and Cane Cholla (Opuntia prolifera, Opuntia parryi). The Coastal Cactus Alliance has been mapped as far inland as the northeastern edge of the Los Angeles Plain Subsection (Coastal Section) and the northwestern edge of the Santa Ana Mountains Subsection (Mountains Section). It is associated with other shrubs such as California Sagebrush (Artemisia californica), California Buckwheat (Eriogonum fasciculatum), Sumacs (Rhus spp.), California Encelia (Encelia californica), Black Sage (Salvia mellifera), Bush Monkeyflower (Mimulus aurantiacus), and grasses in scattered locations of nine subsections at elevations up to about 1800 ft (548 m).

SQ
SOFT SCRUB - MIXED CHAPARRAL ALLIANCE

Ground disturbances such as fire and urban development often initiate the development of this relatively short-lived shrub alliance. It is a mixture of subshrubs, forbs, and woody shrubs, having a substantial woody shrub component. These areas have been mapped in transitional areas often found in proximity to the California Sagebrush and Lower Montane Mixed Chaparral Alliances in the Coast Section. These sites are typically at elevations below about 3400 ft (1036 m) on moderately steep slopes in the Coast Section and below about 5800 ft (1768 m) in the Mountains Section on steep slopes there. Indicator species include California Sagebrush (Artemisia californica), California Buckwheat (Eriogonum fasciculatum), White Sage

(Salvia apiana), Deerweed (Lotus scoparius), Coyote Brush (Baccharis pilularis), California Encelia (Encelia californica), Bush Monkeyflower (Mimulus aurantiacus), Bush Poppy (Dendromecon rigida), Straggly Keckiella (Keckiella cordifolia), Yerba Santa (Eriodictyon spp.), and Goldenbush (Ericameria spp.). In addition, Chamise (Adenostoma fasciculatum), species of Ceanothus, scrub Interior and Canyon Live Oaks (Quercus wislizenii var. frutescens, Q. chrysolepis var. nana) and Scrub Oak (Q. berberidifolia) may become minor components of this alliance.

SS
CALIFORNIA SAGEBRUSH ALLIANCE

This Alliance occurs in several habitats, including coastal environments such as the dunes south of Point Conception and coastal slopes of the Coastal Section. It also is found in more interior low-elevation locations below the Lower Montane Mixed Conifer Alliance and in local pockets of disturbed or dry sites, typically at elevations below about 3000 ft (915 m). The Alliance usually has a prominent California Sagebrush (Artemisia californica) component along with a varying mixture of other shrubs, subshrubs, and perennials. These associates include Black or Purple Sage (Salvia mellifera, Salvia leucophylla), Laurel Sumac (Malosma laurina), Lemonade Berry (Rhus integrifolia), California Buckwheat (Eriogonum fasciculatum), Coyote Brush (Baccharis pilularis), California Encelia (Encelia californica), minor amounts of Chamise (Adenostoma fasciculatum), Deerweed (Lotus scoparius), and grasses. These species produce a vegetative cover, which rapidly invades disturbed areas. This type intergrades with the Lower Montane Chaparral, California Buckwheat (Eriogonum fasciculatum), and Sumac (Rhus spp.) shrub alliances. Annual grasses and forbs and Coast Live Oak (Quercus agrifolia) are found in close proximity to this type in many areas.

SY
CHAPARRAL YUCCA ALLIANCE

Chaparral Yucca (Yucca whipplei), a nutritious and adaptable species used by wildlife and Native Americans, occasionally dominates a dry site in southern California. It has been mapped very sparsely on steep, relatively undisturbed slopes in the Northern Transverse Ranges Subsection of the Mountains Section at elevations between about 4000 – 6200 ft (1220 – 1891 m) in association with other xeric species such as California Buckwheat (Eriogonum fasciculatum) and Singleleaf Pinyon Pine (Pinus monophylla). Annual grasses and forbs are sometimes found spatially adjacent to or within this alliance.

TB
BITTERBRUSH – SAGEBRUSH ALLIANCE

Both Bitterbrush (Purshia tridentata var. glandulosa and P. mexicana var. stansburyana) and Big Sagebrush (Artemisia tridentata) occur together in this alliance on dry, inland sites. Although pure stands of Bitterbrush are rare in this zone, this alliance is desirable to map since it is an important browse species for desert wildlife and adds nitrogen to these typically nutrient-poor soils. However, the alliance has been mapped only very sparsely in the San Gorgonio Mountains Subsection of the Mountains Section at elevations approximating 7200 ft (2196 m). These areas would otherwise by dominated by Ponderosa or Jeffrey Pines (Pinus ponderosa, P. jeffreyi), Big Sagebrush and herbaceous dryland species.

TM
HORSEBRUSH ALLIANCE

Portions of the southwestern Mojave Desert are often dominated by Horsebrush (species of Tetradymia) at elevations between 3400 - 5400 ft (1036 - 1646 m). It has been mapped sparsely in the Little San Bernardino – Bighorn Mountains Subsection of the Mountain Section on distinctly north-facing slopes and on moderately steep slopes. Associated species include Blackbush (Coleogyne ramosissima), Singleleaf Pinyon Pine (Pinus monophylla), Muller Scrub Oak (Quercus cornelius-mulleri), Creosote Bush (Larrea tridentata), Cheesebush (Hymenoclea salsola), Boxthorn (Lycium spp.), Four-wing Saltbush (Atriplex canescens), and Bitterbrush (Purshia tridentata var. glandulosa) and, in Riverside County, Joshua Tree (Yucca brevifolia) and California Juniper (Juniperus californica) as well.

TS
SNOWBERRY ALLIANCE

Species of Snowberry (Symphoricarpos spp.) rarely dominate a site in this zone but this alliance has been mapped sparsely in the Northern Transverse Subsection of the Mountains Section at elevations between about 6000 – 8700 ft (1830 – 2654 m). Mountain Snowberry (S. rotundifolius), the most important species at these altitudes, occurs on rocky areas and in forest openings within the Jeffrey Pine (Pinus jeffreyi), Eastside Pine and Mixed Conifer – Fir Alliances. Great Basin influence is indicated by its association with Rabbitbrush species (Chrysothamnus spp.) and Big Sagebrush (Artemisia tridentata) and at the higher elevations, with Limber Pine (P. flexilis).

WL
WILLOW (SHRUB) ALLIANCE

Shrub forms of Willow (Salix spp.) have been mapped in most subsections of the Coast and Mountain Sections from western Santa Barbara to southern San Diego Counties at elevations generally below about 7000 ft (2135 m). Narrowleaf (S. exigua), Arroyo (S. lasiolepis), Shining (S. lucida), Scouler (S. scouleriana) and Sitka (S. sitchensis) Willows are likely to occur at these elevations in this alliance. Riparian associates of these sites include tree Willows, Cottonwoods (Populus spp.), White Alder (Alnus rhombifolia), Elderberry (Sambucus spp.), Baccharis species and too often herbaceous species like the invasive Giant Reed (Arundo donax).

WM
BIRCHLEAF MOUNTAIN MAHOGANY ALLIANCE

Birchleaf Mountain Mahogany (Cercocarpus betuloides) may occasionally occur in pure stands on xeric, semi-desert, cliff, or even moist sites to the exclusion of other species. The Birchleaf Mountain Mahogany Alliance, where it is the dominant shrub, is also associated with the conifers Bigcone Douglas-fir (Pseudotsuga macrocarpa) and Singleleaf Pinyon Pine (Pinus monophylla), the hardwoods Canyon Live Oak (Quercus chrysolepis), and shrubs such as Chamise (Adenostoma fasciculatum), species of Ceanothus and Manzanita (Arctostaphylos spp.), various Scrub or shrubby Oaks (Quercus spp.), and Flannelbush (Fremontodendron californicum ssp. californicum). These stands have been mapped mainly below about 8000 ft (2440 m) in the Mountains Section on steep and often south-facing slopes.

HERBACEOUS

HA
ALKALINE MIXED GRASSES AND FORBS ALLIANCE

Alkaline and hyper-saline soils occur in xeric sectors of this zone in internal drainage basins that accumulate soluble salts and may have moist pockets. Areas occupied by herbaceous species and grasses adapted to these conditions have been mapped sparsely as the Alkaline Mixed Grasses and Forbs alliance in the Desert Slopes Subsection of the Mountain Section within an elevation range of about 100 – 3500 ft (31 – 1068 m). These sites are adjacent to other desert species such as Creosote Bush (Larrea tridentata) and Saltbush species (Atriplex spp.), alliances such as the Desert Mixed Scrub and Alkaline Mixed Scrub, as well as barren or alkaline flat areas. In addition, herbaceous and graminoid species such as Saltgrass (Distichlis spicata), Alkali Sacaton (Sporobolus airoides) and Bush Seepweed (Suaeda moquinii) may be included in this mixture.

HC
PICKLEWEED - CORDGRASS ALLIANCE

This coastal salt marsh alliance is has been mapped sparsely and widely in seven subsections of the Coastal Section close to sea level. Pickleweed (Salicornia spp.) and Cordgrass (Spartina spp.) generally are dominants in this Alliance, associated with other estuarine plants such as Saltgrass (Distichlis spicata) and freshwater wetlands species such as Bulrushes (Scirpus spp.).

HG
ANNUAL GRASSES AND FORBS ALLIANCE

Low to mid-montane areas of southern California may develop extensive or restricted areas of dry grasslands in otherwise well-vegetated shrub or woodland regions. Conditions that restrict the growth and maintenance of, and invasion by species of surrounding vegetation include the occurrence of pockets of fine-textured (clayey) soils, a frequent fire regime, and ground-disturbing activities such as grazing, crop agriculture, and mining. Many exotic grasses are characteristic of this type, including species of wild oats (Avena spp.), various Bromes (Bromus spp.), Foxtail Fescue (Vulpia myuros), and Kentucky Bluegrass (Poa pratensis). This alliance also includes some perennial grasses that develop on coarse, well-drained soils occurring within sunny openings of Jeffrey and Ponderosa Pine (Pinus jeffreyi, Pinus ponderosa) savannas. In addition to species mentioned above, the Alliance may also include more natives such as some Sedges (Carex spp.), Melic Grass (Melica spp.), and Checker Bloom (Sidalcea malviflora). This type has been mapped typically on sites up to 4600 ft (1402 m) in the Coast Section and up to about 7800 ft (2379 m) in the Mountains Section.

HJ
WET MEADOWS ALLIANCE

Mountain meadows develop in coniferous areas on fine-textured, more or less permanently moist, or wet soils. These conditions in southern California often develop from springs, seeps or faulted areas in which a high water table is maintained

throughout the year. The San Bernardino, San Jacinto, and Peninsular Ranges contain many scattered moist mountain meadow areas at elevations generally above 3000 ft (914 m) in the south and higher in the north. They often have a dense growth of Sedges (Carex spp.), Rushes (Juncus spp.), perennial grasses such as Mat Muhly (Muhlenbergia richardsonis) and San Bernardino Bluegrass (Poa atropurpurea) and annual and perennial herbaceous species such as False Hellebore (Veratrum californicum), Clovers (Trifolium variegatum, Trifolium wormskioldii), Monkey Flower (Mimulus guttatus), etc. Mountain meadow areas have been mapped in the San Gorgonio Mountain region (San Bernardino NF) and elsewhere. Willows (Salix spp.), Roses (Rosa spp.), and Blue Elderberry (Sambucus mexicana) may occur along streambanks associated with some of these meadows. Although a range of hydric conditions usually occur within the same meadow (dry to saturated), the permanency of the water source at their lowest topographic level characterizes mountain meadows.

HM
PERENNIAL GRASSES AND FORBS ALLIANCE

Pockets of perennial grasses, often native species, and herbaceous plants occur abundantly in the Coast Section and occasionally in the Mountains Section at elevations generally below 5200 ft (1586 m). This Alliance forms on seasonally moist, low-gradient slopes. It is a form of dry to moist grassland in which the species composition is a mix of perennial and some annual grasses and legumes that vary according to management practices. Native perennial grasses such as Needlegrass (Achnatherum spp.) may occur in addition to Dropseed (Sporobolus spp.), Squirreltail (Elymus elymoides), and Wildrye (Leymus spp.). Introduced perennials such as Foxtail (Alopecurus myosuroides) and Tall Fescue (Festuca arundinacea) may be present with non-native forbs such as Strawberry Clover (Trifolium fragiferum) and non-native annual grasses such as Foxtail Chess (Bromus madritensis) and Ripgut Grass (Bromus diandrus) in this type. Some native forbs such as Southern Mules Ears (Wyethia ovata) may be found in this type as well. Some of these areas are currently being used for livestock pasture where the type intergrades with the Annual Grasses and Forbs Alliance.

HT
TULE - CATTAIL ALLIANCE

Cattail or Tule marshes occur near lakes and springs in widespread locations in this general area of the state. They have been mapped as high as 4600 ft (1402 m) elevation in the Mountains Section and up to about 1800 ft (550 m) in the Coast Section. Dominant species include Sedges (Carex spp.), Tule (Scirpus spp.), Cattail (Typha spp.), and Spikerush (Eleocharis spp.). A number of other species associate with this Alliance depending on the geographic area, including the invasive forb Loosestrife (Lythrum spp.). Past drainage activities have significantly reduced the total area once covered by this wetlands Alliance.

NON-NATIVE VEGETATION

IA
GIANT REED/ PAMPAS GRASS ALLIANCE

This non-native and herbaceous alliance is dominated by invasive graminoids such as Giant Reed (Arundo donax) in wetlands or Black and White Pampas Grasses (Cortaderia jubata, Cortaderia selloana) on moist, disturbed sites. It has been mapped in stringers within five subsections of the Mountains Section and four in the Coast Section, mainly at elevations below about 2200 ft (671 m). Associated species include tree and shrub Willows (Salix spp.), the shrub Mule Fat (Baccharis salicifolia) and other riparian hardwoods such as Fremont Cottonwood (Populus fremontii).

IC
NON-NATIVE/ORNAMENTAL CONIFER ALLIANCE

Planted conifers comprise this Alliance, including species such as Canary or Norfolk Island Pines (Araucaria spp.), Deodar and Atlas Cedars (Cedrus deodar, Cedrus atlantica), Redwood (Sequoia sempervirens), Scotch Pine (Pinus sylvestris), etc. Other non-native hardwoods, shrubs, and grasses may be associated in minor amounts. Mapped areas of this Alliance are usually in developed areas, including urban and residential landscapes, parks, recreational areas, highways, cemeteries, etc.

IF
NON-NATIVE / INVASIVE FORB / GRASS ALLIANCE

Riparian and upland areas in southern California are sometimes invaded by aggressive herbaceous species that are not native to this state or area, as well as graminoids discussed elsewhere. Without managed control, these areas are often difficult to use for agricultural or recreational land purposes. They often require multi-year restoration procedures, including weeding, burning and reseeding with desirable species. Some of the problem species include Perennial Peppergrass (Lepidium latifolium), which may cause illness in horses, Medusahead Grass (Taeniatherum – or Elymus – caput-medusae), which may physically injure

grazing livestock, Puncturevine (Tribulus terrestris), which is toxic to livestock, Russianthistle (Salsola tragus), which is an alternate host for an insect carrying a virus that infects certain crops, Yellow Starthistle (Centaurea solstitialis), which is also toxic to horses and poses a challenge to eradicate, and many other Knapweeds (Centaurea spp.).

IG
NON-NATIVE/ORNAMENTAL GRASS ALLIANCE

Ornamental or non-native planted grass species define this alliance, although other non-native conifers, hardwoods, and shrubs may be associated as minor elements. Mapped areas of this Alliance are usually in developed areas, including urban and residential landscapes, parks, recreational areas, highways, cemeteries, etc.

IH
NON-NATIVE/ORNAMENTAL HARDWOOD ALLIANCE

Ornamental or non-native hardwood species dominate this alliance, although other non-native conifers, shrubs, and grasses may be present. Mapped areas of this Alliance are usually in developed areas, including urban and residential landscapes, parks, recreational areas, highways, cemeteries, etc.

IM
NON-NATIVE/ORNAMENTAL CONIFER/HARDWOOD ALLIANCE

Mixtures of ornamental or non-native conifer and hardwood species comprise the dominant species of this Alliance. Small amounts of non-native pure stands of hardwood, conifer, shrubs, and grasses may be also associated with this Alliance. Mapped areas of this Alliance are usually in developed areas, including urban and residential landscapes, parks, recreational areas, highways, cemeteries, etc.

IS
NON-NATIVE/ORNAMENTAL SHRUB ALLIANCE

Ornamental or non-native shrub species dominate this alliance, although other non-native conifers, hardwoods, and grasses may be present in this Alliance. Mapped areas of this alliance are usually in developed areas, including urban and residential landscapes, parks, recreational areas, highways, cemeteries, etc. Invasive shrubs such as Scotch Broom (Cytisus scoparius) may be included in this mixture.

LAND USE AND NON-VEGETATED CLASSES

A1
CONIFER AGRICULTURE

Agricultural or horticultural land planted to and dominated by single or multiple species of conifers may have year-round or seasonal uses of these lands. Examples include tree nurseries that provide seedlings for forestry restoration, “Christmas tree” plantations for seasonal uses, and the like. Native or exotic conifers may also be planted in narrow rows as wind breaks or for ornamentation uses within agricultural cropland, such as occasional plantations of Pacific Redwoods (Sequoia sempervirens) or Cypresses and Cedars (Cupressus, Callitropsis, Cedrus).

A2
VINEYARD – SHRUB AGRICULTURE

Vines or shrubs may dominate the woody component of plantations on agricultural or horticultural lands used in the production of food or fiber such as vines devoted to grapes and kiwi fruit and shrubby nut or fruit crops such as blueberries or raspberries.

A3
TILLED EARTH AGRICULTURE

Agricultural lands may be mapped as barren and lacking vegetation on occasion, such as after harvesting and during seasons prior to crop growth. Some areas may be kept fallow during and after the growing season for various reasons such as conservation of moisture and nutrients in a crop rotation schedule.

A4
ORCHARD AGRICULTURE

Orchards are usually evergreen or deciduous small trees producing fruit or nut crops, usually planted in rows with or without irrigation channels. Apples, citrus fruits, avocados, almonds, walnuts, peaches, olives and other familiar crops cover many acres in California. Occasionally, shrub forms may become horticulturally trained to resemble small trees, such as filberts.

A5
FLOODED ROW CROP AGRICULTURE

Agricultural lands planted to row crops are periodically flooded using flow-through structures such as levees, ditches and irrigation boxes in certain seasons for the production of wild and other rices in California. These areas are often underlain by poorly drained clay soils of the Central Valley that are unsuitable for production of other crops and are drained at harvest time. Some rice lands are reflooded after harvest to provide habitat for waterfowl such as ducks and geese that traditionally used the Pacific flyway for migration from northern to southern locations. The crushing of post-harvest rice straw in these areas provides a habitat for invertebrates which serve as high protein food for these overwintering waterfowl.

A6
GRAIN AND CROP AGRICULTURE

Irrigated or dry crop agriculture is usually harvested in rows as edible herbaceous products such as cereals (wheat, sorghum, oats, millet, corn, rye, etc.) and "vegetables" (squash, celery, beans, peas, etc.) for livestock and human uses. Agricultural crop fields are also occasionally planted for both animal forage and to improve nitrogen levels, as with legumes such as alfalfa and sweet clovers. Certain crops are grown for other multiple uses, such as flax and cotton for their seed oils (that is, linseed and cottonseed oils), fibers and medicinal uses, etc.

A7
AGRICULTURE PONDS / WATER FEATURES

Some artificially constructed water features on otherwise agricultural sites on farms, ranches and the like, are large enough to map and document. These sites include stock ponds, small reservoirs, large ditches and other utilitarian or recreational water features.

A8
AGRICULTURAL NURSERIES (GENERAL)

Horticultural sites within or outside urban areas may be mappable features. Many of these include potted or sometimes rooted woody or herbaceous plants that are sold as retail or wholesale species in various combinations and growth stages. Nurseries that are planted only to conifers are included in the Conifer Agriculture category.

AG
AGRICULTURE

Agricultural land is used primarily for the production of food and fiber. High-altitude imagery indicates agricultural activity by distinctive geometric field and road patterns on the landscape and traces produced by mechanized equipment. Agricultural land uses include forest landscapes such as orchards as well as non-forested land uses such as vineyards and field crops. This type represents agricultural features in which a prevailing covertype has not been determined. Land used exclusively for livestock pasture may, however, be mapped as Annual Grassland in those cases in which land uses are not recognizable.

AK
ALKALINE FLATS

Small barren areas in close proximity to the coast in Ventura County have been mapped as Alkaline Flats. These sites tend to be flooded in winter but dry out completely by late summer, creating saline or alkaline conditions in which vegetation is absent. They have been mapped sparsely in this zone in the Oxnard Plain-Santa Paula Valley Subsection of the Coast Section and are found adjacent to dry or moist grasslands or coastal marshes. Sites have also been identified in the Desert Slopes Subsection of the Mountains Section at elevations from about 2200 – 2600 ft (671 – 792 m). Such areas are adjacent to xeric types such as the Alkaline Grasses and Forbs, Saltbush (Atriplex spp.) and Creosote Bush (Larrea tridentata) Alliances.

BA
BARREN

Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography are labeled as Barren. This category includes mappable landscape units in which surface lithology is dominant, such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It does not include areas considered as modified or developed, as in urban areas, but may include quarries and mine sites.

DU
DUNE

The occurrence of coastal dunes in this zone is identified by those sandy accumulating areas in which coastal headlands are usually absent, such as at Vandenberg Air Force Base, where they are best preserved. Dunes have been mapped as a barren type of landscape, including sandy beach areas extending from San Diego to Santa Barbara Counties, although finer-scale mapping in these areas might identify considerable shrubs and perennials such as Heather Goldenbush (Ericameria ericoides), Dune Lupine (Lupinus chamissonis), California Sagebrush (Artemisia californica), Giant Woollystar (Eriastrum densifolium), Dune Buckwheat (Eriogonum parvifolium), California Croton (Croton californicus), Common Deerweed (Lotus scoparius), Sand Verbena (Abronia latifolia), Dune Senecio (Senecio blochmaniae), California-Aster (Lessingia filaginifolia), the exotic Sea-Fig (Carpobrotus chilensis), and perennial graminoids such as Carex spp. and Bromus spp. The only vegetated dunes mapped in this region occur in northwestern Santa Barbara County as the Coastal Lupine Alliance, which contains many of these species.

IB
URBAN-RELATED BARE SOIL

Urban development in southern California occurs in phases. When land is cleared prior to being paved, this category represents the occurrence of non-vegetated barren ground that is caused by urbanization. This land-use type also represents other mechanically-caused barren ground, such as open quarries or mined areas, barren ground along highways, and other areas cleared of vegetation prior to construction. This category has been mapped extensively throughout this region, usually adjacent to agricultural areas, already established urbanized centers or paved areas of the landscape.

IW
DEVELOPED WATER FEATURES

Facilities for the capture and storage of surface or ground waters are sometimes quite visible in developed landscapes and can be recognized easily on aerial photographs. In southern California, these areas have been mapped in seven subsections of the Coast and eight subsections of the Mountain Sections. Such features as golf course ponds, collecting basins for replenishment of aquifers at the southern edges of the San Gabriel Mountains, small lakes in public parks, water and sewage treatment facilities and the like are included. This category may also identify some water treatment facilities within agricultural and rural areas, where they are often located.

OS
BEACH SAND

Oceanside littoral areas in southern California are rarely maintained as dunes but rather as managed beaches for recreationists and residents. Such linear features are usually not vegetated. Some areas closer to land, however, are often planted and maintained with non-native shrub and herbaceous species that help to stabilize blowing sands and are aesthetically pleasing. Beach sand areas may fluctuate in width from year to year due to their erosion under storm conditions, lack of coarse sediment replenishment from other causes such as inappropriate placement of jetties as well as depositional events such as manual replacement of sand by beach managers. These areas have been mapped in Ventura, Los Angeles and Orange Counties but similar beaches in San Diego County have been identified in older maps as “Barren” strips.

UB
URBAN OR DEVELOPED

This category applies to landscapes that are dominated by urban structures, residential units, or other developed land use elements such as highways, city parks, cemeteries and the like. In those cases in which the managed landscapes may have a considerable vegetation component, other land use categories may be more appropriate, such as Ornamental Conifer and Hardwood mixtures within city parks. Much of the landscape in southern California has been mapped in this category.

WA
WATER

Water is labeled in Calveg mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams, and canals of various size, bays and estuaries and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows, Tule-Cattail freshwater marshes, or Pickleweed-Cordgrass saline or mixed marshes. Islands of sufficient size within water bodies are mapped according to their terrestrial dominant vegetation types.

SECONDARY MAPPING SOURCES IN ZONE 7

Other data sources have been used in this zone to augment mapping originated by the Remote Sensing Lab or its contractors. These were used to fill in areas that had not been mapped by RSL, but no or very little structural information or accuracy assessments are available for these layers. The sources are indicated as attributes within the tiling geodatabase structure given as downloadable files on the RSL web page. Calveg types have been crosswalked from the files in the original sources and described above in other areas; these types are indicated as occurring in the Channel Islands, as follows:

Conifers
- Bishop Pine - PM
- Torrey Pine - PT

Hardwoods
- Coastal Mixed Hardwood - EX
- Riparian Mixed Hardwood - NR
- Coast Live Oak - QA
- Willow (tree) - QO
- Eucalyptus - QZ

Shrubs
- Coyote Brush - CK
- Lower Montane Mixed Chaparral - CQ
- Scrub Oak - CS
- Coastal Bluff Scrub - SH
- Coastal Lupine - SL
- Soft Scrub - Mixed Chaparral - SQ
- California Sagebrush (Coastal Sage Scrub) - SS

Herbaceous
- Annual Grasses and Forbs - HG
- Perennial Grasses and Forbs - HM
- Tule - Cattail - HT

Non-native Vegetation
- Non-native / Invasive Forbs - IF

Land-Use and Non-Vegetated
- Agriculture - AG
- Barren - BA
- Dunes - DU
- Urban - UB
- Water - WA

Appendix A4

Profile of the City Supplement

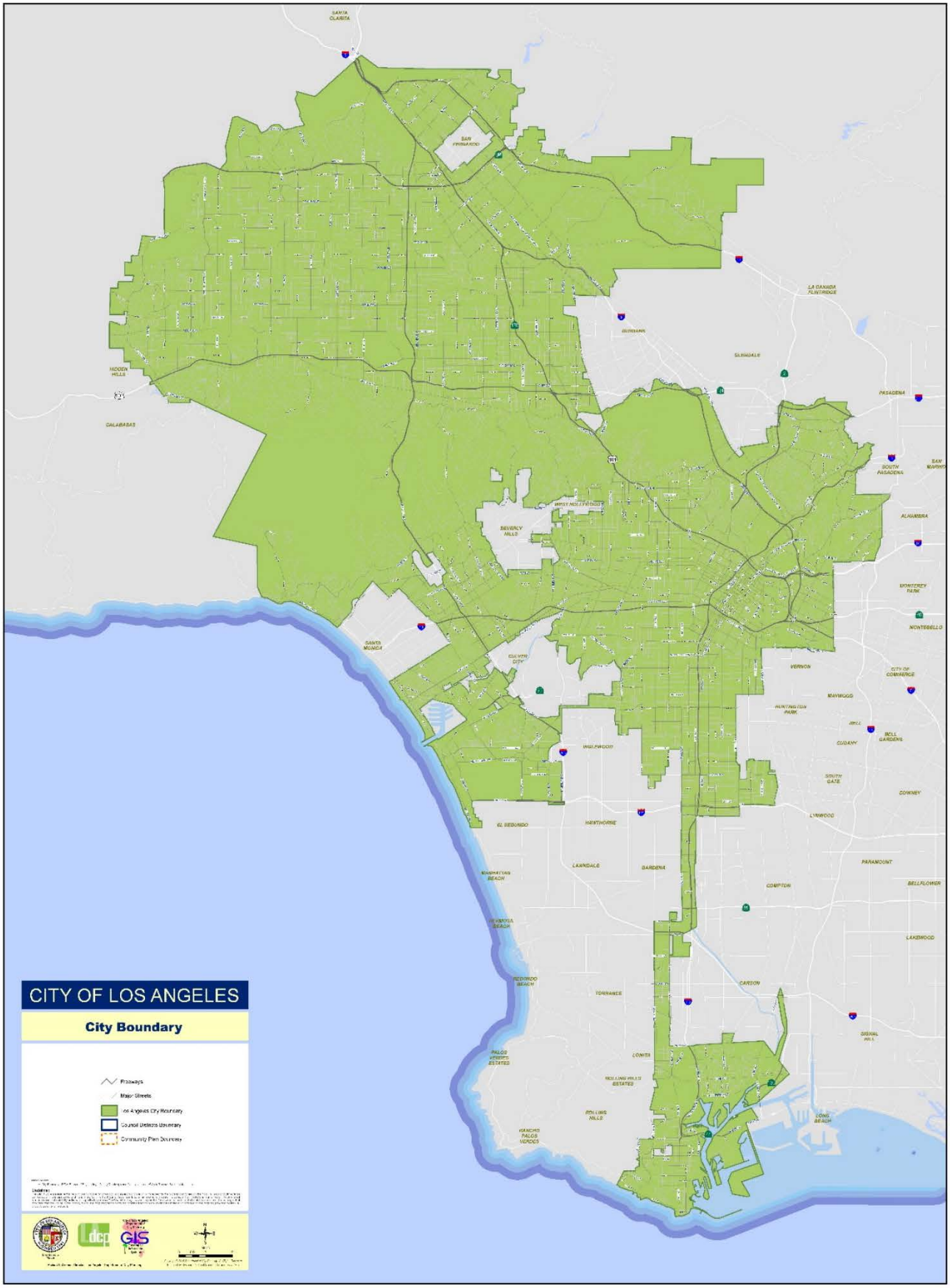


Figure A4.1. City Boundary
Department of City Planning. City Boundary. https://planning.lacity.org/MapGallery/Image/Citywide/CityBoundary.pdf

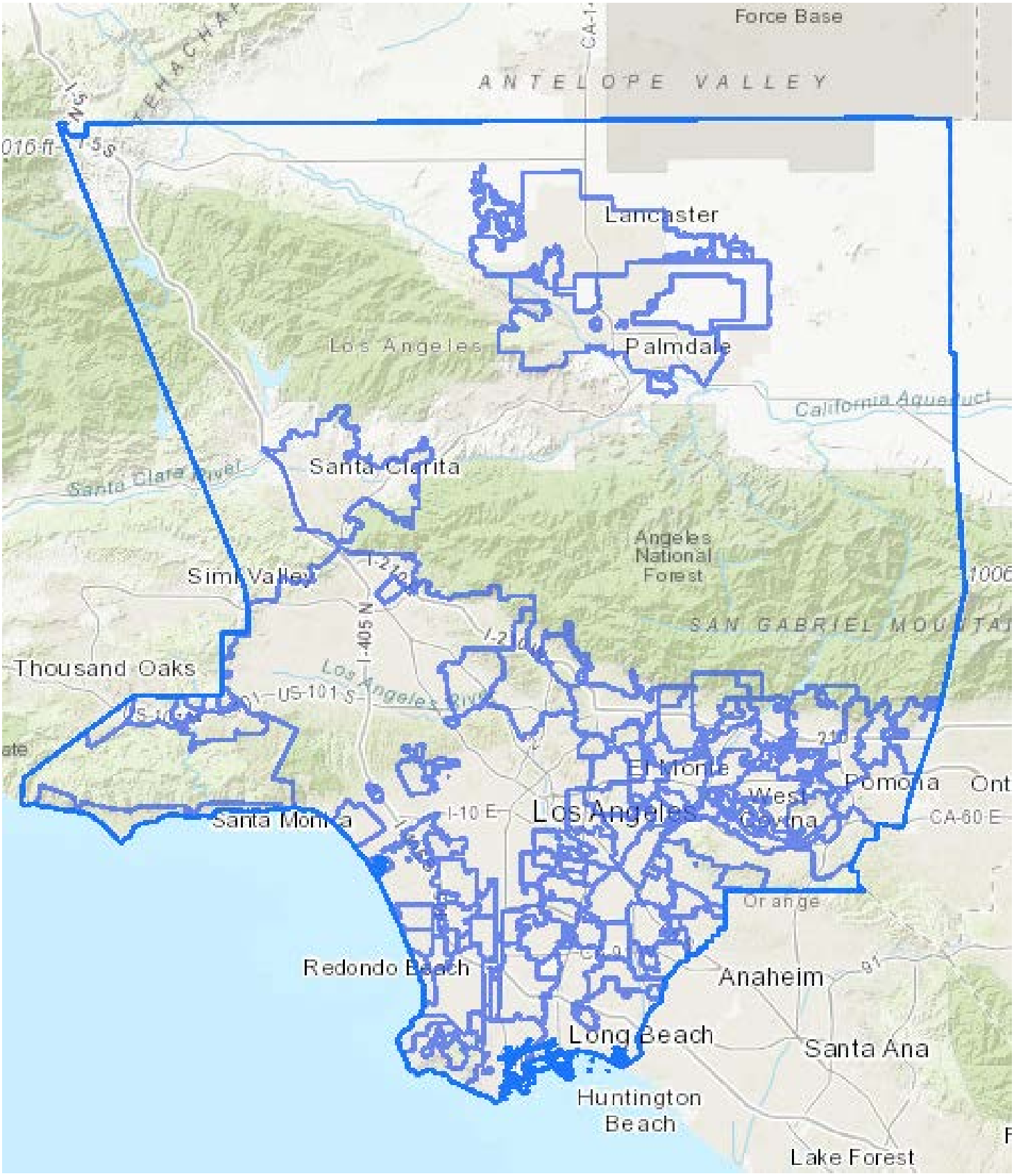


Figure A4.2. City Annexations Within the County of Los Angeles

Department of Public Works. City Annexations Within the County of Los Angeles. http://dpw.lacounty.gov/mpm/cityannexations/

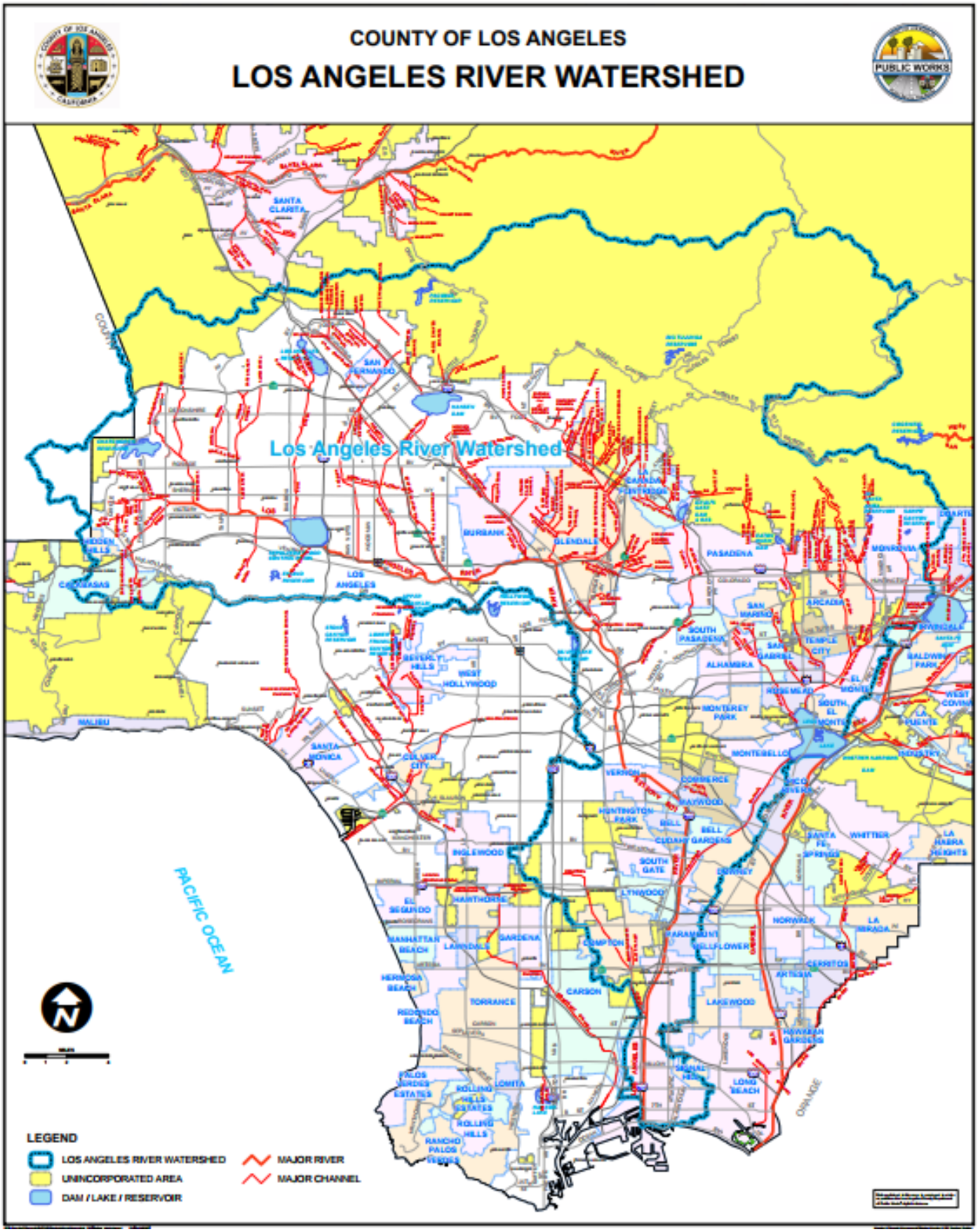


Figure A4.3. Los Angeles River Watershed
County of Los Angeles. Los Angeles River Watershed. https://dpw.lacounty.gov/wmd/watershed/la/docs/lariver_wtrshed.pdf

Location	Elevation (feet)	Annual Precipitation (inches)
Santa Monica (Coast)	0	13.23
Downtown	260	14.77
LA River Source	772	
Santa Monica Mountains (lowest)	1,000	15
San Gabriel Mountains (lowest)	1,641	
Santa Monica Mountains (highest)	3,114	28
Mt. Wilson	5,730	33.35
San Gabriel Mountains (highest)	10,069	

Table A4.1. Precipitation by Elevation within the City of Los Angeles

U.S. Climate Data (2017). Temperature - Precipitation - Sunshine – Snowfall. https://www.usclimatedata.com/climate/los-angeles/california/united-states/usca1339

Given Place Media, Los Angeles Almanac (2017). Monthly Climate Summaries Selected Los Angeles County Locations through 2015. http://www.laalmanac.com/weather/we02.php#rain

Given Place Media, Los Angeles Almanac (2017). Mountain Peaks & Other High Points Los Angeles County by Elevation (feet above sea level). http://www.laalmanac.com/geography/ge05.php

	California	LA County	City of LA
Population	39,144,818	10,170,292	3,971,896
Population density (per sq. mile)		2,419	8,092.30
GDP (millions of dollars)			$1,001,677
Per capita income	$31,587	$29,403	$30,136
Median home value	$449,100	$497,200	$542,100
Median Household income	$64,500	$59,134	$52,024
Individuals below poverty	15.30%	16.60%	20.50%

Table A4.2. Demographics and Economics

U.S. Census Bureau (2016). American Community Survey 1-year estimates. Retrieved from Census Reporter Profile page for Los Angeles, CA. https://censusreporter.org/profiles/16000US0644000-los-angeles-ca/

Bureau of Economic Analysis. “Gross Domestic Product by Metropolitan Area.” U.S. Department of Commerce (2016) https://www.bea.gov/newsreleases/regional/gdp_metro/2017/pdf/gdp_metro0917.pdf

Mitra, S., Sedgwick S.M., De Anda R., and Perdomo A. “Los Angeles: People, Industry and Jobs, 2016-2021.” Institute for Applied Economics (2017, June) https://laedc.org/wp-content/uploads/2017/06/People-Industry-and-Jobs_FINAL_2016-2021.pdf

Economic & Workforce Development Department, City of Los Angeles (2013-2017). Los Angeles Economic & Workforce Development Department, L.A. Economy & Key Assets. http://ewddlacity.com/index.php/the-l-a-economy

U.S. Department of Commerce (2017). United States Census Bureau, QuickFacts: Los Angeles County. https://www.census.gov/quickfacts/fact/table/losangelescountycalifornia,losangelescitycalifornia/POP060210

Industry	Growth	Loss
Health Care/Social Assistance	20.3	
Accommodation/Food Services	15.1	
Government	12.9	
Admin/Support/Waste Services	11.5	
Retail Trade	5.9	
Educational Services	3.2	
Real Estate/Rental/Leasing	3	
Arts/Entertainment	2.7	
Finance and Insurance	2.6	
Prof/Scientific/Tech Services	2.3	
Management of Companies	1.6	
Transportation/Warehousing	1.2	
Information	1.1	
Other services	0.9	
Utilities	0.1	
Mining and Logging		-0.5
Construction		-2.6
Wholesale Trade		-3.1
Manufacturing		-8.5

Table A4.3. Industry Growth/Loss by Sector

Cooper, Christine, Kimberly Ritter-Martinez and Shannon Sedgwick (2016). Institute for Applied Economics. file:///C:/Users/myriid483/Downloads/2016-LAC-Economic-Update_20161129.pdf

Designation	Common Name	Scientific Name	Adopted	LA Native - Historically	La Native - Current
Amphibian	California red-legged frog	*Rana draytonii*	2014	Yes	Yes
Animal	California grizzly bear	*Ursus californicus*	1953	Yes	No
Bird	California valley quail	*Lophortyx californica*	1931	Yes	Yes
Fish	California golden trout	*Salmo aqua bonita*	1947	No	No
Flower	Golden poppy	*Eschscholzia*	1903	Yes	Yes
Grass	Purple needlegrass	*Nassella pulchra*	2004	Yes	Yes
Insect	California dogface butterfly	*Zerene eurydice Boisduval*	1972	Yes	Yes
Lichen	Lace lichen	*Ramalina menziesii*	2015	Yes	Yes
Marine fish	Garibaldi	*Hypsypops rubicundus*	1995	Yes	Yes
Marine mammal	California gray whale	*Eschrichtius robustus*	1975	Yes	Yes

Marine reptile	Pacific leatherback sea turtle	*Dermochelys coriacea*	2012	Yes	Yes
Reptile	California desert tortoise	*Gopherus agasizzii*	1972	No	No
Tree	California redwood (Coast redwood)	*Sequoia sempervirens*	1937	No	No
	Giant sequoia	*Sequoia gigantea*	1937	No	No

Table A4.4. California State Symbols
California State Library (2017). State Symbols. http://www.library.ca.gov/history/symbols.html

Category	Subcategory	Website Name	URL
City	Main		https://www.lacity.org/
	Sustainability Plan		https://www.lamayor.org/Sustainability-Plan
	Departments	Bureau of Sanitation	https://www.lacitysan.org/
		Bureau of Street Services: Urban Forestry	http://bss.lacity.org/urbanforestry/
		Department of Public Works	http://dpw.lacity.org/
		Los Angeles World Airports	https://www.lawa.org/
		LA Department of Water and Power	https://www.ladwp.com/
		Recreation and Parks	http://www.laparks.org/
		City Planning	http://planning.lacity.org/
		Animal Services	http://www.laanimalservices.com/
		Public Works	http://dpw.lacity.org/
		Los Angeles Zoo	http://www.lazoo.org/
		Port of Los Angeles	https://www.portoflosangeles.org/
County	Agencies	Department of Parks and Recreation	http://parks.lacounty.gov/wps/portal/dpr
		California Science Center	http://californiasciencecenter.org/contact
State		California's Environmental Protection Agency	https://calepa.ca.gov/
		California Department of Fish and Wildlife	https://www.wildlife.ca.gov/Data/CNDDB
Federal		U.S. Environmental Protection Agency	https://www.epa.gov/
		National Oceanic and Atmospheric Administration	http://www.noaa.gov/

Table A4.5. Administration of Biodiversity

Type	Management Department/Agency	Number in City	Number in County	Number in State
National parks	National Park Service	0	1	9
National Forests		0	1	19
National Wildlife Refuges		0	2?	31

State Parks	California State Parks	10?	25	118
State Forests		0	0	8
State Nature Preserves		0	0	1
State Reserves		0	0	11
State Wildlife Areas		0	0	11
County Parks	Los Angeles County Department of Parks and Recreation	N/A	258	N/A
Municipal City Parks	Los Angeles City Department of Recreation and Parks	174	N/A	N/A

Table A4.6. Natural area protection

California State parks (2017). California's Parks http://www.stateparks.com/california_parks_and_recreation_destinations.html

Subcategory	Website Name	URL
Biodiversity Indices	The DPSIR Framework	http://wwz.ifremer.fr/dce/content/download/69291/913220/file/DPSIR.pdf
	The Millennium Ecosystem Assessment	https://www.millenniumassessment.org/en/index.html
	Intergovernmental Platform for Biodiversity and Ecosystem Services	https://www.ipbes.net/
	Convention on Biological Diversity	https://www.cbd.int/
	Group on Earth Observations Biodiversity Observation Network	http://geobon.org/
	Singapore Index	https://www.cbd.int/help/underdevelopment.shtml
	Biophilic Cities	http://biophiliccities.org/
	City Biodiversity Indicators Coalition	http://www.iclei.org/activities/agendas/biodivercity.html
	ecoBUDGET	http://www.ecobudget.org/
	Global Biodiversity Information Facility (GBIF) Local Government Manual	https://www.gbif.org/sites/default/files/documents/gbif_best_practice_guide_data_publishing_by_local_governments_en_v1.pdf
	Local Biodiversity Strategies and Action Plan (LBSAP) Guidelines	file:///C:/Users/myriid483/Downloads/LBSAP-Guidelines%20(1).pdf
	LOCAL BIODIVERSITY STRATEGIES AND ACTION PLANS	http://archive.iclei.org/index.php?id=12223
	Local Government Biodiversity Management Guidebook	https://portals.iucn.org/library/node/45803
	The Economics of Ecosystems and Biodiversity (TEEB) Manual for Cities	http://www.teebweb.org/teeb-study-and-reports/additional-reports/manual-for-cities/
	Urban Protected Areas (UPA) Toolkit	https://www.iucn.org/content/urban-protected-areas-profiles-and-best-practice-guidelines
Associations	TreePeople	https://www.treepeople.org/
	Natural Resource Defense Council	https://www.nrdc.org/
Stormwater	U.S. Army Corps of Engineers, LA District	http://www.spl.usace.army.mil/
	U.S Geological Survey	http://water.usgs.gov/
	Caltrans Stormwater Program	http://www.dot.ca.gov/hq/env/stormwater/
	California Coastal Commission	https://www.coastal.ca.gov/
	California State Water Resources Control Board	https://www.waterboards.ca.gov/
	Southern California Coastal Waters Research Project	http://www.sccwrp.org/Homepage.aspx
	City of Los Angeles Stormwater Program	http://www.lastormwater.org/
	California Stormwater Quality Association	https://www.casqa.org/

	Heal the Bay	https://healthebay.org/
	Los Angeles WATERKEEPER	http://lawaterkeeper.org/
	Surfrider Foundation	http://www.surfrider.org/
	Friends of the LA River	https://folar.org/
	Topanga Watershed Committee	http://www.topangaonline.com/twc/
	Council for Watershed Health	https://www.watershedhealth.org/
	Watershed Conservation Authority	https://www.wca.ca.gov/
Landscape Resources	Theodore Payne Foundation	http://theodorepayne.org/
Biodiversity	Conservation International	https://www.conservation.org/How/Pages/Hotspots.aspx
	The Nature Conservancy	https://www.nature.org/
	The Natural History Museum	https://nhm.org/site/
	California Invasive Plant Council	http://cal-ipc.org/paf/
	World Wildlife Fund	https://www.worldwildlife.org/

Table A4.6. Environmental/Biodiversity Organizations

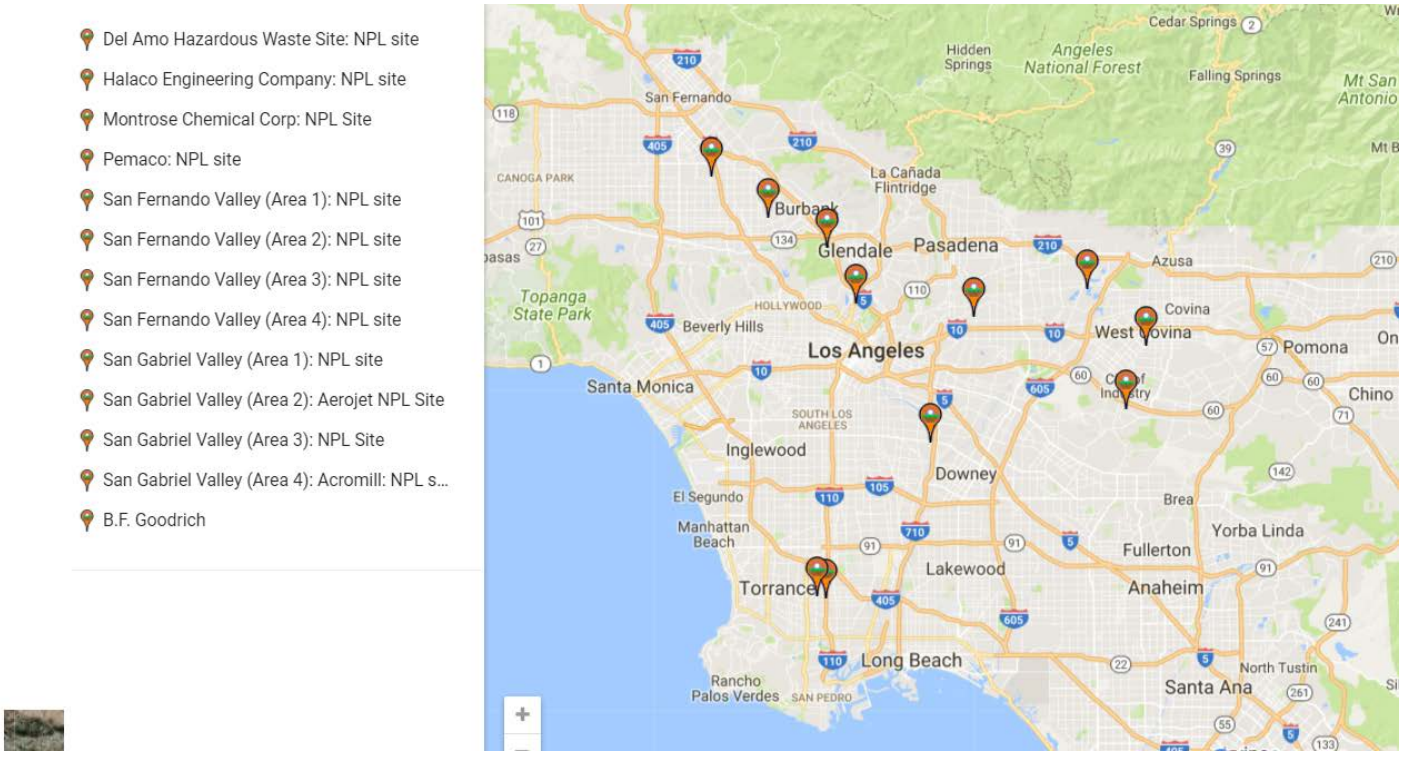


Figure A4.4. Brownfield Sites

City webpage listing results of assessments and completed brownfields projects and projects underway: https://www.lacitysan.org/san/faces/wcnav_externalId/s-lsh-es-si-b-bss?_adf.ctrl-state=5kuo8wl1g_4&_afrLoop=4424826233513101#!

https://www.lacitysan.org/san/faces/wcnav_externalId/s-lsh-es-si-b-bss-asass?_adf.ctrl-state=5kuo8wl1g_4&_afrLoop=4424924157654113#!

Superfund National Priorities List (NPL) Where You Live Map

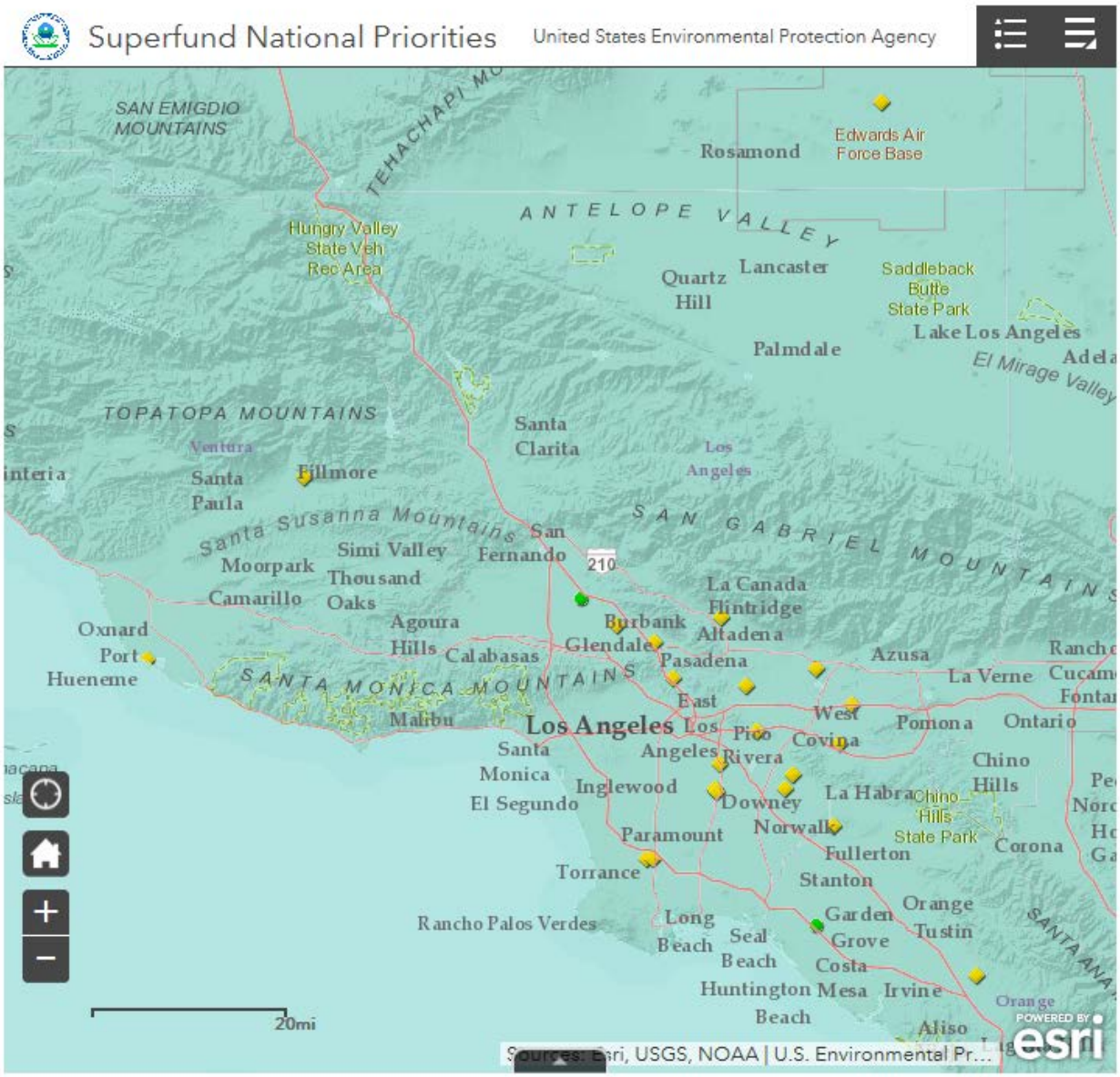


Figure A4.5. Superfund Sites:
https://www.epa.gov/superfund/search-superfund-sites-where-you-live

Appendix A5

Sunset Climate Zones of Los Angeles

Sunset climate zones: Los Angeles region

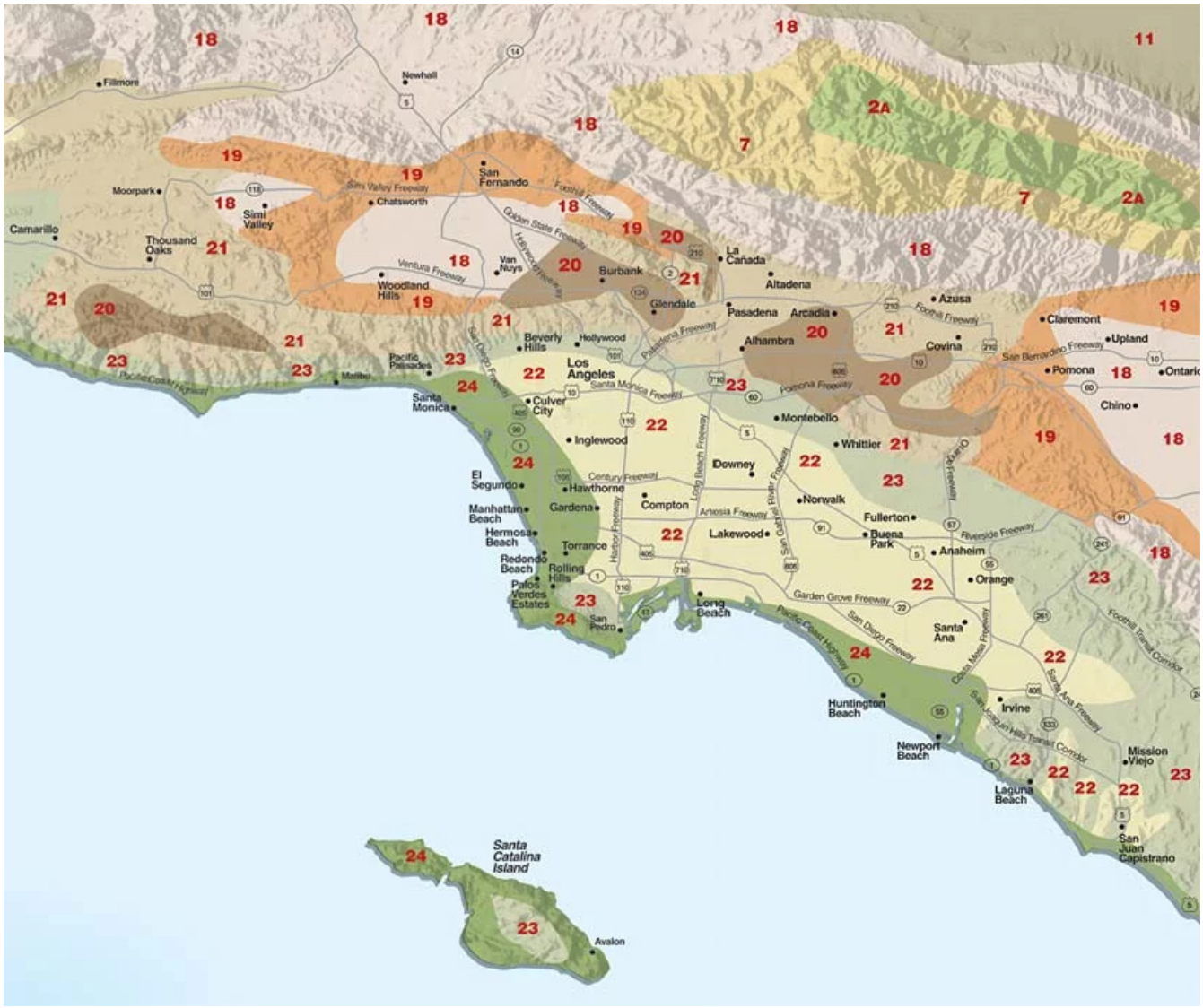


Figure A5.1. Sunset Climate Zones (Los Angeles/Orange County Area)

Source: https://www.sunset.com/garden/climate-zones/sunset-climate-zone-los-angeles-area

ZONE 2A: Cold mountain and intermountain areas

Another snowy winter climate, Zone 2A covers several regions that are considered mild compared with surrounding climates. You'll find this zone stretched over Colorado's northeastern plains, a bit of it along the Western Slope and Front Range of the Rockies, as well as mild parts of river drainages like those of the Snake, Okanogan, and the Columbia. It also shows up in western Montana and Nevada and in mountain areas of the Southwest. This is the coldest zone in which sweet cherries and many apples grow. Winter temperatures here usually hover between 10 and 20°F (–12 to –7°C) at night, with drops between –20 and –30°F (–29 and –34°C) every few years. When temperatures drop below that, orchardists can lose even their trees. The growing season is 100 to 150 days.

ZONE 3A: Mild areas of mountain and intermountain climates

East of the Sierra and Cascade ranges, you can hardly find a better gardening climate than Zone 3a.Winter minimum temperatures average from 15 to 25°F (–9 to –4°C), with extremes between –8 and –18°F (–22 and –28°C). Its frost-free growing season runs from 150 to 186 days. The zone tends to occur at lower elevations in the northern states (eastern Oregon and Washington as well as Idaho), but at higher elevations as you move south crossing Utah's Great Salt Lake and into northern New Mexico and Arizona. Fruits and vegetables that thrive in long, warm summers, such as melons, gourds, and corn, tend to do well here. This is another great zone for all kinds of deciduous fruit trees and ornamental trees and shrubs. Just keep them well watered.

ZONE 18: Above and below the thermal belts in Southern California's interior valleys

Zones 18 and 19 are classified as interior climates. This means that the major influence on climate is the continental air mass; the ocean determines the climate no more than 15 percent of the time. Many of the valley floors of Zone 18 were once

regions where apricot, peach, apple, and walnut orchards flourished, but the orchards have now given way to homes. Although the climate supplies enough winter chill for some plants that need it, it is not too cold (with a little protection) for many of the hardier subtropicals like amaryllis. It is too hot, too cold, and too dry for fuchsias but cold enough for tree peonies and many apple varieties, and mild enough for a number of avocado varieties. Zone 18 never supplied much commercial citrus, but home gardeners who can tolerate occasional minor fruit loss can grow citrus here. Over a 20-year period, winter lows averaged from 22 to 17°F (–6 to –8°F). The all-time lows recorded by different weather stations in Zone 18 ranged from 22 to 7°F (–6 to –14°C).

ZONE 19: Thermal belts around Southern California's interior valleys

Like that of neighboring Zone 18, the climate in Zone 19 is little influenced by the ocean. Both zones, then, have very poor climates for such plants as fuchsias, rhododendrons, and tuberous begonias. Many sections of Zone 19 have always been prime citrus-growing country—especially for those kinds that need extra summer heat in order to grow sweet fruit. Likewise, macadamia nuts and most avocados can be grown here. The Western Plant Encyclopedia cites many ornamental plants that do well in Zone 19 but are not recommended for its neighbor because of the milder winters in Zone 19. Plants that grow well here, but not in much colder zones, include bougainvillea, bouvardia, calocephalus, Cape chestnut (Calodendrum), flame pea (Chorizema), several kinds of coral tree (Erythrina), livistona palms, Mexican blue and San Jose hesper palms (Brahea armata, B. brandegeei), giant Burmese honeysuckle (Lonicera hildebrandiana), myoporum, several of the more tender pittosporums, and lady palm (Rhapis excelsa). Extreme winter lows over a 20-year period ranged from 28 to 22°F (–2 to –6°C) and the all-time lows at different weather stations range from 23 to 17°F (–5 to –8°C). These are considerably higher than the temperatures in neighboring Zone 18.

ZONE 20: Cool winters in Southern California's areas of occasional ocean influence

In Zones 20 and 21, the same relative pattern prevails as in Zones 18 and 19. The even-numbered zone is the climate made up of cold-air basins and hilltops, and the odd-numbered one comprises thermal belts. The difference is that Zones 20 and 21 get weather influenced by both maritime air and interior air. In these transitional areas, climate boundaries often move 20 miles in 24 hours with the movements of these air masses. Because of the greater ocean influence, this climate supports a wide variety of plants.You can see the range of them at the Los Angeles County Arboretum in Arcadia. Typical winter lows are 37° to 43°F (3 to 6°C); extreme 20-year lows average from 25 to 22°F (–4 to –6°C).Alltime record lows range from 21 to 14°F (–6 to –10°C).

ZONE 21: Thermal belts in Southern California's areas of occasional ocean influence

The combination of weather influences described for Zone 20 applies to Zone 21 as well. Your garden can be in ocean air or a high fog one day and in a mass of interior air (perhaps a drying Santa Ana wind from the desert) the next day. Because temperatures rarely drop very far below 30°F (–1°C), this is fine citrus growing country. At the same time, Zone 21 is also the mildest zone that gets sufficient winter chilling for most forms of lilacs and certain other chill-loving plants. Extreme lows—the kind you see once every 10 or 20 years—in Zone 21 average 28 to 25°F (–2 to –4°C).All-time record lows in the zone were 27 to 17°F (–3 to –8°C).

ZONE 22: Cold-winter portions of Southern California's coastal climate

Areas falling in Zone 22 have a coastal climate (they are influenced by the ocean approximately 85 percent of the time). When temperatures drop in winter, these cold-air basins or hilltops above the air-drained slopes have lower winter temperatures than those in neighboring Zone 23. Actually, the winters are so mild here that lows seldom fall below freezing. Extreme winter lows (the coldest temperature you can expect in 20 years) average 28 to 25°F (–2 to –4°C). Gardeners who plant under overhangs or tree canopies can grow subtropical plants

that would otherwise be burned by a rare frost. Such plants include bananas, tree ferns, and the like. The lack of a pronounced chilling period during the winter limits the use of such deciduous woody plants as flowering cherry and lilac. Many herbaceous perennials from colder regions fail here because the winters are too warm for them to go dormant.

ZONE 23: Thermal belts of Southern California's coastal climate

One of the most favored areas in North America for growing subtropical plants, Zone 23 has always been Southern California's best zone for avocados. Frosts don't amount to much here, because 85 percent of the time, Pacific Ocean weather dominates; interior air rules only 15 percent of the time. A notorious portion of this 15 percent consists of those days when hot, dry Santa Ana winds blow. Zone 23 lacks either the summer heat or the winter cold necessary to grow pears, most apples, and most peaches. But it enjoys considerably more heat than Zone 24—enough to put the sweetness in 'Valencia' oranges, for example—but not enough for 'Washington' naval oranges, which are grown farther inland. Temperatures are mild here, but severe winters descend at times. Average lows range from 43 to 48°F (6 to 9°C), while extreme lows average from 34 to 27°F (1 to –3°C).

ZONE 24: Marine influence along the Southern California coast

Stretched along Southern California's beaches, this climate zone is almost completely dominated by the ocean. Where the beach runs along high cliffs or palisades, Zone 24 extends only to that barrier. But where hills are low or nonexistent, it runs inland several miles.

This zone has a mild marine climate (milder than Northern California's maritime Zone 17) because south of Point Conception, the Pacific is comparatively warm. The winters are mild, the summers cool, and the air seldom really dry. On many days in spring and early summer, the sun doesn't break through the high overcast until afternoon. Tender perennials like geraniums and impatiens rarely go out of

bloom here; spathiphyllums and pothos become outdoor plants; and tender palms are safe from killing frosts. In this climate, gardens that include such plants as ornamental figs, rubber trees, and scheffleras can become jungles.

Zone 24 is coldest at the mouths of canyons that channel cold air down from the mountains on clear winter nights. Several such canyons between Laguna Beach and San Clemente are visible on the map. Numerous others touch the coast between San Clemente and the Mexican border. Partly because of the unusually low temperatures created by this canyon action, there is a broad range of winter lows in Zone 24. Winter lows average from 42°F (5°C) in Santa Barbara to 48°F (9°C) in San Diego. Extreme cold averages from 35° to 28°F (2 to –2°C), with all-time lows in the coldest stations at about 20°F (–6°C).

The all-time high temperatures aren't greatly significant in terms of plant growth. The average all-time high of weather stations in Zone 24 is 105°F (41°C). Record heat usually comes in early October, carried to the coast by Santa Ana winds. The wind's power and dryness usually causes more problems than the heat itself—but you can ameliorate scorching with frequent sprinkling.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, services and activities.

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environment LA SANITATION
CITY OF LOS ANGELES

Isaac Brown
Ecology Studio