

Vegetation Descriptions

CENTRAL VALLEY ECOLOGICAL PROVINCE

CALVEG ZONE 5

March 12, 2009

Note: This geographically diverse Province consists of

- Three subsections in the Northern California Interior Coast Ranges Section (M261C) ["Ranges"]
- Twenty-six subsections in the Great Valley Section (262A) ["Valley"]
- Five subsections in the Sierra Nevada Foothills Section (M261F) ["Foothills"]
 - Tuscan Flows (M261Fa) ["Tuscan"]
 - Lower Foothills Metamorphic Belt (M261Fb) ["Lower Metamorphic"]
 - Lower Granitic Foothills (M261Fc) ["Lower Granitic"]
 - Southern Granitic Foothills (M261Fd) ["Southern Granitic"]
 - San Emigdio Mountains (M261Fe) ["San Emigdio"]

Steepness of slope is indicated as:

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

Note: Douglas-fir consists of two species in this zone and were given two common names to distinguish them

CONIFER FOREST / WOODLAND

DF

PACIFIC DOUGLAS-FIR ALLIANCE

Pure stands of Pacific Douglas-fir (*Pseudotsuga menziesii*) occur only sparsely on moist or shaded sites in the Foothills and Ranges Sections of this zone at elevations up to about 4600 ft (1402 m). They are usually young, dense monotypic stands that occur adjacent to trees such as Ponderosa Pine (*Pinus ponderosa*), Canyon Live Oak (*Quercus chrysolepis*) and Blue Oak (*Q. douglasii*).

DM

BIGCONE DOUGLAS-FIR ALLIANCE

Bigcone Douglas-fir (*Pseudotsuga macrocarpa*) occurs in a limited distribution from the Santa Ynez Mountains (Santa Barbara County in the South Coast and Montane Ecological Calveg zone) and the Tehachapi Mountains (Kern County in this zone) south to San Diego County. As a conifer, it has a rare ability to sprout from dormant buds buried below its thick bark after scorching by surface (not crown) fires and is adaptable to a variety of site conditions from moist canyon bottoms to dry hillslopes. However, Bigcone Douglas-fir dominated stands have been mapped only sparsely in this zone. They were identified in the extreme southern area of the Foothills Section at elevations below about 6000 ft (1830 m) and are close to more abundant populations in the South Coast and Montane Ecological Calveg zone. Associates include semi-arid species such as Singeleaf Pinyon Pine (*Pinus monophylla*), Tucker Oak (*Quercus john-tuckeri*) and Canyon Live Oak (*Q. chrysolepis*) in the Tehachapi Mountains.

DP

DOUGLAS – FIR - PINE ALLIANCE

This Alliance is a mixture of Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*) that usually occur on moderately steep slopes below an elevation of about 5200 ft (1586 m). It has been mapped sparsely in the Ranges Section and occasionally in the Foothills Section. Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Q. wislizenii*) and Blue Oak (*Q. douglasii*) are common hardwood associates. Shrubs in low to mid montane environments are also likely to be associated with these stands such as Whiteleaf Manzanita (*Arctostaphylos viscida*).

DW

DOUGLAS - FIR - WHITE FIR ALLIANCE

Douglas - Fir (*Pseudotsuga menziesii*) occasionally associates with White Fir (*Abies concolor*) on mesic slopes at elevations just below about 5000 ft (1524 m) in this zone. It has been mapped very sparsely in the Ranges Section, sometimes with its associate, Canyon Live Oak (*Quercus chrysolepis*) in mixed conifer – hardwood stands.

EP

EASTSIDE PINE ALLIANCE

Jeffrey Pine (*Pinus jeffreyi*) dominates this open forest type found frequently in the xeric, transmontane side of the crests of the San Bernardino and San Gabriel Mountains in the South Coast and Montane Ecological Calveg zone. In this zone (Central Valley Ecological Calveg), outliers of these stands have been mapped occasionally in southwestern areas of the Foothills Section at elevations up to about 7000 ft (2135 m). Great Basin shrubs such as Big Sagebrush (*Artemisia tridentata*) and Tucker Oak (*Quercus john-tuckeri*) are commonly associated in the understory of this type. Trees such as Singleleaf Pinyon Pine (*P. monophylla*), White Fir (*Abies concolor*) and Canyon Live Oak (*Q. chrysolepis*) are also found within and adjacent to these stands.

JP

JEFFREY PINE ALLIANCE

Pure Jeffrey Pine (*Pinus jeffreyi*) dominated stands have been mapped very sparsely in the Foothills Section. In contrast to the Eastside Pine Alliance, the Jeffrey Pine Alliance does not have a Great Basin shrub component, although in this area it occurs in xeric areas as well. These stands are outliers from the more prominent distribution patterns in the Sierra Nevada Mountains, having been mapped at elevations between about 4600 – 6800 ft (1402 – 2074 m). Canyon Live Oak (*Quercus chrysolepis*) is its main hardwood associate on these sites, and Singleleaf Pinyon Pine (*P. monophylla*) often occurs in adjacent stands.

JT

CALIFORNIA JUNIPER ALLIANCE

The arboreal form of California Juniper (*Juniperus californica*) dominates the uppermost conifer layer of this alliance. These stands occur in areas far separated from those of the shrub form in this area, having been mapped sparsely within the Foothills Section at elevations between about 2400 – 5400 ft (732 – 1646 m). Gray Pine (*Pinus sabiniana*) is the most commonly associated tree within these stands in addition to shrubs such as Wedgeleaf Ceanothus (*C. cuneatus*) and California Buckwheat (*Eriogonum fasciculatum*). Annual grasses and herbaceous species are also associated with this type.

KP

KNOBCONE PINE ALLIANCE

Knobcone Pine (*Pinus attenuata*) has been mapped very sparsely in the Foothills and Ranges Sections as remnants of its greater frequencies in other zones. Ponderosa Pine (*P. ponderosa*) and Chamise (*Adenostoma fasciculatum*) are found adjacent to these sites, which have been mapped at elevations below about 3200 ft (976 m).

MD

INCENSE CEDAR ALLIANCE

Incense Cedar (*Calocedrus decurrens*), a wide-ranging species that competes well on a variety of sites, has been mapped extremely sparsely as a dominant conifer in the Foothills Section below about 4800 ft (1464 m). Singleleaf Pinyon Pine (*Pinus monophylla*) and Mixed Conifer – Pine Alliances are found adjacent to these sites.

MF

MIXED CONIFER - FIR ALLIANCE

This Alliance is extensive in many areas of the state and usually consists of a mixture of conifer species in which White Fir (*Abies concolor*) usually forms a conspicuous component. This type is rare in this zone, but has been mapped in limited areas of the Foothills and Ranges Sections in proximity to national forests within an elevation range of about 3600 – 7600 ft (1098 – 2318 m). The Eastside Pine, Singleleaf Pinyon Pine (*Pinus monophylla*), Big Sagebrush (*Artemisia tridentata*) and Upper Montane Mixed Chaparral Alliances are associated types towards the east and Pacific Douglas-fir (*Pseudotsuga menziesii*) and Mixed Conifer – Pine Alliances towards the west. Canyon Live Oak (*Quercus chrysolepis*) is consistently present in both areas.

MI

PIUTE CYPRESS ALLIANCE

The species Arizona Cypress (Cupressus arizonica) is wide-ranging and occurs more commonly in the southwestern states and Mexico. One of its rarely occurring subspecies, Piute Cypress (Cupressus arizonica ssp. nevadensis), has been identified and mapped very sparsely within Kern County in the Foothills Section within an elevation range of about 4000 – 5800 ft (1220 – 1768 m). Interior Live Oak (Quercus wislizenii) is an associated hardwood in this type in addition to shrubs in the Lower Montane Mixed Chaparral Alliance such as Wedgeleaf Ceanothus (Ceanothus cuneatus) and California Buckwheat (Eriogonum fasciculatum).

MN

MCNAB CYPRESS ALLIANCE

McNab Cypress (Cupressus macnabiana) occupies and dominates some upland ultramafic (peridotite) sites of the Sierra foothills of the Central Valley Ecological Calveg zone. Outliers have been mapped very sparsely in the Foothills Section on gabbroic rocks below about 2800 ft (854 m) elevation. Ponderosa Pine (Pinus ponderosa) and Interior Live Oak (Quercus wislizenii) are trees associated with this Alliance.

MP

MIXED CONIFER -PINE ALLIANCE

The Mixed Conifer - Pine Alliance has been mapped sparsely in the Foothills and Ranges Sections. It is typically found at slightly higher altitudes than the Ponderosa Pine (Pinus ponderosa) Alliance but generally below about 7000 ft (2135 m) as mapped in the Foothills and Ranges Sections. Important components of this Alliance in these foothills areas include Douglas - Fir (Pseudotsuga menziesii) in the west, Ponderosa Pine (Pinus ponderosa), and Singleleaf Pinyon Pine (P. monophylla) in the east and both the Upper and Lower Mixed Chaparral Alliance in both areas. Canyon Live Oak (Quercus chrysolepis) is the main hardwood associate in the south.

PD

GRAY PINE ALLIANCE

Gray Pine (Pinus sabiniana) forms sparse to prominent open stands throughout this zone at lower elevations up to about 5200 ft (1586 m). This type is very common in the Ranges and Foothills Sections and less so in the Valley Section. Blue Oak (Quercus douglasii) is generally adjacent to or within these sites and Interior Live Oak (Quercus wislizenii) and minor amounts of Ponderosa Pine (P. ponderosa) also occur, mainly in the Foothills Section. Shrubs such as Chamise (Adenostoma fasciculatum) and Wedgeleaf Ceanothus (C. cuneatus) are common low-elevation shrubs associated with this type.

PJ

SINGLELEAF PINYON PINE ALLIANCE

Singleleaf Pinyon Pine (Pinus monophylla) has been mapped abundantly in the San Emigdio Subsection of the Foothills Section. In this area, it is mainly found adjacent to the Eastside Pine and Canyon Live Oak (Quercus chrysolepis) Alliances. This semi-arid open woodland alliance may also include Junipers (Juniperus spp.), scrub oaks such as Tucker Oak (Quercus john-tuckeri), Manzanitas (Arctostaphylos spp.) and Big Sagebrush (Artemisia tridentata). It generally occurs on steep slopes and up to an elevation of about 7400 ft (2256 m).

PP

PONDEROSA PINE ALLIANCE

Ponderosa Pine (Pinus ponderosa) occasionally dominates the vegetation of sites that are less shaded than those occupied by Douglas – fir (Pseudotsuga menziesii) in the same general elevation range. Any of the common oaks may associate with the pine in this alliance, including Canyon Live Oak (Quercus chrysolepis), Interior Live Oak (Quercus wislizenii), Black Oak (Quercus kelloggii), Blue Oak (Quercus douglasii), or very infrequently, Valley Oak (Quercus lobata). The Ponderosa Pine Alliance has been mapped with abundance in the Foothills Section and infrequently in the Valley and Ranges Sections. It is found on all slopes and aspects in this zone, mainly at elevations below about 6000 ft (1830 m). Lower montane chaparral shrubs such as scrub oaks (Quercus spp.), Chamise (Adenostoma fasciculatum) and Ceanothus species are also associated with this type.

PW

PONDEROSA PINE - WHITE FIR ALLIANCE

Ponderosa Pine (*Pinus ponderosa*) and White Fir (*Abies concolor*) occur together in this Alliance with no other significant conifers present in the mixture. This type has been mapped very rarely, and occurs in the extreme northeastern border of the San Emigdio Subsection of the Foothills Section. Slopes are very steep, aspects tend to be northerly and elevations are between about 5800 – 6200 ft (1768 – 1890 m). The principal associates are herbaceous species in the Annual Grasses and Forbs Alliance and Black Oak (*Quercus kelloggii*).

HARDWOOD FOREST / WOODLAND

NR

RIPARIAN MIXED HARDWOOD ALLIANCE

Riparian areas often are a mixture of hardwoods with some shrubs rather than areas of monotypic species. Such sites have been mapped sparsely in all three sections of this zone at elevations generally below about 4200 ft (1280 m). Typical hardwoods species mixtures in the Central Valley include Willows (*Salix* spp.), Valley Oak (*Quercus lobata*), Fremont Cottonwood (*Populus fremontii*), California Sycamore (*Platanus racemosa*), and White Alder (*Alnus rhombifolia*). Blue Oak (*Q. douglasii*) is a closely associated upland hardwood that may occasionally be found in this mixture.

NX

INTERIOR MIXED HARDWOOD ALLIANCE

No single species is dominant in the Interior Mixed Hardwood Alliance. It has been identified in scattered pockets in the Valley and Ranges Sections and more abundantly in the Foothills Section. Density of Blue Oak (*Quercus douglasii*) and Interior Live Oak (*Q. wislizenii*) usually exceed that of Black Oak (*Q. kelloggii*) in this mixture. Minor amounts of California Buckeye (*Aesculus californica*), California Bay (*Umbellularia californica*), and Coast Live Oak (*Q. agrifolia*) may also be included. Because this Alliance has been mapped mainly at elevations below about 5000 ft (1524 m), it is likely to have inclusions of lower elevation chaparral species such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*), scrub Oaks (*Quercus* spp.) and Chamise (*Adenostoma fasciculatum*).

QA

COAST LIVE OAK ALLIANCE

This type, dominated by Coast Live Oak (*Quercus agrifolia*), has been mapped sparsely on mesic inland slopes in the Valley and Ranges Sections. It is also found adjacent to Blue Oak (*Quercus douglasii*) and Gray Pine (*Pinus sabiniana*) stands on mesic savannas. In these locations, it occurs below about 2600 ft (792 m) in association with low elevation chaparral species such as Chamise (*Adenostoma fasciculatum*) and scrub Oaks (*Quercus* spp.).

QC

CANYON LIVE OAK ALLIANCE

Canyon Live Oak (*Quercus chrysolepis*) as a dominant species has been frequently mapped in scattered stands in the Foothills and Ranges Sections at elevations below about 6400 ft (1952 m). Its main conifer associates include Pacific Douglas-fir (*Pseudotsuga menziesii*), Ponderosa Pine (*Pinus ponderosa*), Gray Pine (*P. sabiniana*) and in the Tehachapi Mountains, also with Singleleaf Pinyon Pine (*P. monophylla*). Interior Live Oak (*Q. wislizenii*), Wedgeleaf Ceanothus (*C. cuneatus*) and annual grasses and forbs are also likely to be found within and adjacent to these stands.

QD

BLUE OAK ALLIANCE

This Alliance is dominated by Blue Oak (*Quercus douglasii*) which naturally occurs in an oak-grass association on well drained, gentle slopes as identified in the three sections of this zone. It has been mapped more frequently than any other naturally occurring alliance in this area other than the Annual Grasses and Forbs Alliance. This hillside alliance occurs on the fringes of the Central Valley from Redding to Bakersfield with a mapped elevation that is usually below about 5000 ft (1524 m). Minor inclusions of trees such as Gray Pine (*Pinus sabiniana*), Ponderosa Pine (*P. ponderosa*), Valley Oak (*Q. lobata*) and/or California Buckeye (*Aesculus californica*) and chaparral shrubs such as Wedgeleaf Ceanothus (*Ceanothus cuneatus*) and Chamise (*Adenostoma fasciculatum*) may also be present. The understory of the Blue Oak Alliance is dominated by annual grasses such as Wild Oats (*Avena* spp.), Cheatgrass (*Bromus* spp.), and Needlegrass (*Achnatherum* spp.).

QE

WHITE ALDER ALLIANCE

White Alder (*Alnus rhombifolia*) dominates the hardwoods component of the vegetation of this low elevation riparian Alliance. It has been mapped very sparsely in the Valley and Foothills Sections at elevations below about 1800 ft (548 m). The shrub California Hazelnut (*Corylus cornuta*) and the perennial Elk Clover (*Aralia californica*) may be found in the White Alder Alliance in addition to upland trees such as Blue Oak (*Quercus douglasii*) and Ponderosa Pine (*Pinus ponderosa*).

QF

FREMONT COTTONWOOD ALLIANCE

Fremont Cottonwood (*Populus fremontii*) occurs adjacent to stream courses within the Central Valley in riparian areas below about 4800 ft (1464 m). This Alliance, where the Cottonwood is the dominant hardwood, occurs in stringers adjacent to the upland Blue Oak (*Quercus douglasii*), Interior Live Oak (*Q. wislizenii*) and Valley Oak (*Q. lobata*) Alliances. It has been identified sparingly in the three sections of this zone. White Alder (*Alnus rhombifolia*) and Black Willow (*Salix gooddingii*) are occasional tree associates. Understory species which commonly occur include Blackberry (*Rubus* spp.), Blue Elderberry (*Sambucus mexicana*), Wild Cucumber (*Marah fabaceus*), and Poison Oak (*Toxicodendron diversilobum*).

QG

OREGON WHITE OAK ALLIANCE

The tree form of Oregon White Oak (*Quercus garryana* var. *garryana*) has been mapped very sparingly in the Ranges Section of this zone at elevations between about 1800 – 3400 ft (548 – 1036 m) in this area. Trees such as Douglas-fir (*Pseudotsuga menziesii*), Ponderosa Pine (*Pinus ponderosa*) and Canyon Live Oak (*Q. chrysolepis*) may be included as minor components of this type.

QH

PACIFIC MADRONE ALLIANCE

Madrone (*Arbutus menziesii*) has been mapped very infrequently in this area as an understory hardwood to Douglas-fir (*Pseudotsuga menziesii*) and Ponderosa Pine (*Pinus ponderosa*) conifer stands. It is much more abundant in moist sites west of the central valley, and has been mapped only in the northeastern portions of the Foothills Section at elevations from around 1700 – 2300 ft (519 – 702 m) in this zone.

QI

CALIFORNIA BUCKEYE ALLIANCE

California Buckeye (*Aesculus californica*), a small tree, may occasionally be found in pure, or nearly pure, stands in northern California up to an elevation to about 5000 ft (1525 m). It has been mapped sparingly in the Valley Section and with more abundance in the Foothills Section. Species such as Poison Oak (*Toxicodendron diversilobum*), California Bay (*Umbellularia californica*), Gray Pine (*Pinus sabiniana*), and Interior Live Oak (*Quercus wislizenii*) may be associated with these stands. Slopes are generally steep or very steep canyonsides or streamsides which are often generally north or west facing. Soils on these sites tend to be relatively coarse-textured sandy or gravelly loams in many areas.

QJ

COTTONWOOD - ALDER ALLIANCE

White Alder (*Alnus rhombifolia*) and Fremont Cottonwood (*Populus fremontii*) occur together very rarely in the Valley and Foothills Sections of this zone. This riparian Alliance has been mapped at elevations below about 2000 ft (610 m).

QK

BLACK OAK ALLIANCE

California Black Oak (*Quercus kelloggii*), a deciduous oak, generally occurs on well-drained soils as a dominant hardwood. It is relatively drought-resistant and has a wide elevation range above about 650 ft (200 m) in California. This alliance has been mapped very sparingly in the Ranges Section and frequently in the Foothills Section. It often associates with Blue, and Canyon and Interior Live Oaks (*Quercus douglasii*, *Q. chrysolepis*, *Q. wislizenii*) in mixed hardwood stands in this area below about 6400 ft (1952 m). Black Oak forms a prominent understory element in Douglas-fir (*Pseudotsuga menziesii*), Mixed Conifer – Pine and Ponderosa and Gray Pine (*Pinus ponderosa*, *P. sabiniana*) sites of the Sierra foothills.

QL

VALLEY OAK ALLIANCE

This alliance is dominated by Valley Oak (Quercus lobata), a deeply rooting hardwood, which formerly occurred in pure stands of large trees with limited woody understory. These stands occurred on valley bottoms and in rolling slopes, generally below 2000 ft (610 m) in the north. The present distribution pattern of Valley Oak is along major stream courses and on the deep, rich loamy soils of their alluvial deposits in areas within and along the eastern and western fringes of this zone. It has been mapped occasionally as a dominant hardwood in the three sections up to an elevation of about 5000 ft (1524 m) and more rarely as an understory hardwood in Ponderosa Pine (Pinus ponderosa) and Gray Pine (P. sabiniana) forests and woodlands. A few scattered Interior and/or Canyon Live Oaks (Quercus wislizenii, Q. chrysolepis) can be found throughout this Alliance.

QM

BIGLEAF MAPLE ALLIANCE

Bigleaf Maple (Acer macrophyllum), a deciduous hardwood found in a variety of usually moist or shaded habitats, occurs very rarely as a dominant type in this zone. However, it has been mapped very sparsely as a hardwood associate of Douglas-fir (Pseudotsuga menziesii) and Ponderosa Pine (Pinus ponderosa) forests in the elevation range of about 800 ft (244 m). These areas are in the Lower Metamorphic Subsection of the Foothills Section.

QO

WILLOW ALLIANCE

The Willow Alliance is a riparian type consisting of dominant tree Willows (Salix spp.) in any combination found along permanent streams in this zone. It has been mapped very sparsely in the three sections at elevations below about 3700 ft (1128 m). The more common Willows include Arroyo (S. lasiolepis), Black (S. gooddingii), Narrow-leaved (S. exigua), Pacific (S. lucida ssp. lasiandra), and Red (S. laevigata). Black Willow is more likely to dominate sites below about 1650 ft (500 m) in this region. Associated riparian hardwoods include Fremont Cottonwood (Populus fremontii), California Sycamore (Platanus racemosa), and White Alder (Alnus rhombifolia).

QP

CALIFORNIA SYCAMORE ALLIANCE

California Sycamore (Platanus racemosa) reaches its northernmost limit in the eastern sectors of this zone. Although it usually mixes with other riparian hardwood species it may occasionally become dominant along springs, streams, and arroyos which have an underground water supply. The alliance has been mapped, for example, very sparingly along the Deer Creek drainage in the Foothills Section generally at elevations below about 2000 ft (610 m). Associated species include Willows (Salix spp.), White Alder (Alnus rhombifolia), Bigleaf Maple (Acer macrophyllum), and a variety of forbs and perennial grasses. Upland Blue Oaks (Quercus douglasii) are closely associated with this type.

QT

TANOAK ALLIANCE

The historic distribution range of Tanoak (Lithocarpus densiflorus) in the Sierra foothills area of this zone is mainly north of Amador County, although it is also found south to Mariposa County. Tanoak has been mapped very sparsely in this zone at elevations in the vicinity of 2000 ft (610 m). It has been identified only as an understory hardwood alliance in association with the Douglas-fir (Pseudotsuga menziesii), and Ponderosa Pine (Pinus ponderosa) Alliances.

QW

INTERIOR LIVE OAK ALLIANCE

Interior Live Oak (Quercus wislizenii) is a small to medium-sized, deeply rooting hardwood that often is found in shaded or moist sites as an erect tree. It is maintained on drier sites more often in a shrub form and has been mapped as a component of the Scrub Oak Alliance. It reaches its northernmost distribution in this zone and may be the dominant hardwood on recent alluvial terraces, older terraces and rolling hills throughout the Central Valley. This alliance is often located above Blue Oak (Q. douglasii) stands, generally below about 4400 ft (1220 m) in association with species such as Fremont Cottonwood (Populus fremontii), White Alder (Alnus rhombifolia), and upland trees as Canyon Live Oak (Q. chrysolepis), California Buckeye (Aesculus californica), Douglas-fir (Pseudotsuga menziesii) and Gray Pine (P. sabiniana). These sites have been mapped abundantly in the Foothills Section and sporadically in the Valley and Foothills Sections at low elevations. On north aspects and with increased elevation, Interior Live Oak becomes increasingly dominant and forms a prominent band in the foothills of the Sierra Nevada adjacent to the Sierra Nevada Section.

QZ

EUCALYPTUS ALLIANCE

This alliance occurs in pure stands in this zone. These Eucalyptus (Eucalyptus spp.) groves were usually planted, became naturalized and subsequently have dominated the valley sites, reproducing naturally through sprouting. Understory species are usually absent as the ground cover is dominated by litterfall from the shredding bark, leaves, flowers and fruit capsules of these hardwoods. The Eucalyptus Alliance has been mapped sparsely in all three sections at elevations below about 1600 ft (488 m).

TX

MONTANE MIXED HARDWOOD ALLIANCE

This alliance generally occurs on sites favorable to the growth of mid-montane conifers such as Ponderosa Pine (Pinus ponderosa) and usually above the Interior Mixed Hardwood sites. Black Oak (Quercus kelloggii) is the indicator species in this hardwood mixture, occurring with greater canopy cover than other hardwoods in this area. Other species such as Blue, Canyon or Interior Live Oak (Q. douglasii, Q. chrysolepis, Q. wislizenii) may be included, but are not the main species. The Alliance has been mapped sparsely in this zone but occurs in all five subsections of the Foothills Section on moderately steep to steep slopes. Elevations are generally in a wide range from 800 – 6000 ft (244 – 1830 m). The principal overstory conifer associates are Gray Pine (Pinus sabiniana), Douglas-fir (Pseudotsuga menziesii), and Ponderosa Pine.

SHRUBS AND SUBSHRUBS

BC

SALTBUSH ALLIANCE

Species of Saltbush (Atriplex spp.) are dominant in this sparsely mapped xeric, alkaline alliance. It occurs in both the Valley and Foothills Sections at elevations up to about 1200 ft (366 m), generally on low gradient slopes. Such areas are often disturbed and adjacent to developed areas that limit the availability of water on these sites. Types identified as Annual Grasses and Forbs, Urban and Barren are most commonly associated with the Saltbush Alliance in this zone.

BQ

GREAT BASIN – CHAPARRAL MIXED TRANSITION ALLIANCE

This type is defined by a mixture of common Great Basin-affinity shrubs, no single species becoming dominant in the mixture. In this area, the more common components are Big Basin Sagebrush (Artemisia tridentata ssp. tridentata), species of Rabbitbrush (Chrysothamnus spp.), and less commonly in the southeast, Tucker Oak (Quercus john-tuckeri). This type has been mapped sparsely only in the Foothills Section within the elevation range of about 3000 – 7000 ft (915 – 2135 m). Associated trees such as Singleleaf Pinyon Pine (Pinus monophylla) and Canyon Live Oak (Q. chrysolepis) are most likely to be found within or adjacent to these sites.

BR

RABBITBRUSH ALLIANCE

Rabbitbrush, especially Rubber Rabbitbrush (Chrysothamnus nauseosus) occurs in pure, scattered patches in this area that are often interspersed with fields of annual grasses and herbaceous species. This type has been mapped sparsely in the Foothills Section, where it occupies low-gradient, mid-elevation slopes. These areas are often adjacent to both eastside conifers or alliances such as Singleleaf Pinyon Pine (Pinus monophylla) and Eastside Pine and hardwoods such as Blue or Canyon Live Oaks (Quercus douglasii, Q. chrysolepis). Other species adjacent to or represented in minor amounts at these sites typically include dryland species such as California Buckwheat (Eriogonum fasciculatum) and Big Sagebrush (Artemisia tridentata).

BS

BIG SAGEBRUSH ALLIANCE

Big Sagebrush (Artemisia tridentata), the dominant shrub of this Alliance, has been mapped prominently in the Foothills Section and very sparsely in the Valley Section. Its associates in this zone include conifers such as Singleleaf Pinyon Pine (Pinus monophylla), Jeffrey Pine (P. jeffreyi) and shrubs adapted to semiarid conditions such as Tucker Oak (Quercus john-tuckeri) and Rabbitbrush (Chrysothamnus spp.).

BX

GREAT BASIN - MIXED CHAPARRAL TRANSITION ALLIANCE

This Alliance is a mixture of chaparral species including mesic scrub oaks such as shrub Canyon Live Oak (Quercus chrysolepis spp. nana) and Greenleaf Manzanita (Arctostaphylos patula) with an equivalent vegetation cover of Great Basin species such as Big Sagebrush (Artemisia tridentata) and Tucker Oak (Q. john-tuckeri). This transitional type has been mapped sparsely in the Foothills Sections at elevations of up to about 7000 ft (2135 m). Trees such as Singleleaf Pinyon Pine (Pinus monophylla) and Canyon Live Oak (Q. c.) are typically found on adjacent sites.

C1

ULTRAMAFIC MIXED SHRUB ALLIANCE

This type is found on ultramafic soils and has been mapped very sparsely in the Ranges and Foothills Sections at elevations generally below about 2400 ft (732 m) in this zone. The Ultramafic Mixed Shrub Alliance consists of a mixture of shrubs such as Wedgeleaf Ceanothus (Ceanothus cuneatus var. cuneatus), Leather Oak (Quercus durata), Musk Brush (Ceanothus jepsonii), California Coffeeberry (Rhamnus californica ssp. occidentalis), Silk-tassel (Garrya elliptica, G. congdonii), and Siskiyou Mat (Ceanothus pumilus).

CA

CHAMISE ALLIANCE

Relatively pure stands of Chamise (Adenostoma fasciculatum) occupy xeric sites within the elevation range of the Lower Montane Chaparral Alliance of this zone. This alliance has been mapped at elevations up to about 4400 ft (1342 m) and often is found in upper ridge slope positions. Low elevation chaparral shrubs such as scrub Oaks (Quercus spp.) may occur in minor amounts on these sites. Chamise stands have been mapped occasionally in all three sections. Trees such as Gray Pine (Pinus sabiniana), Blue Oak (Q. douglasii) and Interior Live Oak (Q. wislizenii) commonly occur in proximity to Chamise stands in addition to dry grasses and herbaceous species.

CC

CEANOTHUS CHAPARRAL ALLIANCE

Chaparral in this region 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 occasionally in the three sections at elevations below about 4200 ft (1280 m). This low to mid elevation shrub alliance is identified by any of the following prominent species in this area: non-dominant Mountain Whitethorn (C. cordulatus), Wedgeleaf (C. cuneatus), mixed with Chaparral Whitethorn (C. leucodermis), Lemmon (C. lemmonii) or possibly the rarer Kern Ceanothus (C. pinetorum) or Wavyleaf (C. foliosus). Chaparral shrubs such as Birchleaf Mountain Mahogany (Cercocarpus betuloides), scrub Oaks (Quercus spp.) and Chamise (Adenostoma fasciculatum) are commonly associated with these species. Hardwoods such as Blue and Canyon Live Oaks (Q. douglasii, Q. chrysolepis), and conifers such as Ponderosa and Gray Pines (Pinus ponderosa, P. sabiniana) are likely to be found adjacent to these sites. This type typically occurs on cismontane slopes having mesic soils.

CJ

BREWER OAK ALLIANCE

Brewer Oak (Quercus garryana var. breweri) has been mapped as a shrub sparsely in scattered areas of the Foothills Section at elevations between 3000 – 5400 ft (915 – 1646 m) in this zone. Slopes are often steep and north to west facing. Associated species of this Alliance include Blue, Interior Live and Canyon Live Oaks (Q. douglasii, Q. wislizenii, Q. chrysolepis), various chaparral shrubs and annual grasses and herbaceous species.

CL

WEDGELEAF CEANOTHUS ALLIANCE

Wedgeleaf Ceanothus (Ceanothus cuneatus) may dominate low elevation shrub habitats that have recently had ground disturbances such as intense fires as well as on certain nutrient-poor substrates, such as coarse textured soils or ultramafics. This alliance has been mapped occasionally in the three sections at elevations below about 5600 ft (1708 m). Minor amounts of other lower elevation shrubs such as California Buckwheat (Eriogonum fasciculatum) and Chamise (Adenostoma fasciculatum) and trees such as Gray Pine (Pinus sabiniana) and Blue Oak (Quercus douglasii) are typically associated with this Alliance.

CQ

LOWER MONTANE MIXED CHAPARRAL ALLIANCE

This Alliance is a mixture of low-elevation chaparral species such as Whiteleaf and Common Manzanitas (Arctostaphylos viscida, A. manzanita), Wedgeleaf and Lemmon Ceanothus (Ceanothus cuneatus, C. lemmonii), Scrub Oaks (Quercus spp.), Chamise (Adenostoma fasciculatum), Silk-tassel (Garrya fremontii), Birchleaf Mountain Mahogany (Cercocarpus betuloides), California Buckwheat (Eriogonum fasciculatum), and other shrub species below productive coniferous and hardwood sites. No single species is dominant in the mixture. This Alliance has been mapped abundantly in the Ranges and Foothills Sections and more sparsely in the Valley Section, up to an elevation of about 6200 ft (1890 m).

CS

SCRUB OAK ALLIANCE

The Scrub Oak Alliance commonly occurs on moist, well shaded as well as semiarid slopes in the three sections of this zone at elevations below about 5600 ft (1708 m). Any mixture of shrubby oaks may be present, including Scrub Oak (Quercus berberidifolia), Leather Oak (Q. durata), shrub Canyon Live Oak (Q. chrysolepis var. nana) Brewer Oak (Q. garryana var. breweri), and Shrub Interior Live Oak (Q. wislizenii var. frutescens). In addition, Tucker Scrub Oak (Q. john-tuckeri) occurs in very open semi-arid transmontane stands in the Tehachapi Mountains at slightly higher elevations and generally steeper slopes. Conifers in proximity to these sites include Ponderosa and Singleleaf Pinyon Pines (Pinus ponderosa, P. monophylla).

CT

TUCKER OAK ALLIANCE

Dominance by Tucker Oak (Quercus john-tuckeri) identifies this alliance in the San Emigdio Subsection of the Foothills Section, where it has been mapped sparsely towards the southeast. Elevations are generally below about 6400 ft (1952 m), precipitation relatively low and sites are often adjacent to or include minor amounts of Great Basin species such as Singleleaf Pinyon Pine (Pinus monophylla) and Big Sagebrush (Artemisia tridentata), and dry annual grasses and forbs.

CW

WHITELEAF MANZANITA ALLIANCE

Whiteleaf Manzanita (Arctostaphylos viscida) is the dominant shrub of this alliance. It is often found as a major component of specialized habitats such as gabbroic areas of western Placer County in mixture with localized gabbro endemic shrubs and perennials. These sites have been mapped sporadically in the Ranges and Foothills Sections at elevations up to about 4000 ft (1220 m). Typical shrub and tree associates include Chamise (Adenostoma fasciculatum), Wedgeleaf Ceanothus (Ceanothus cuneatus), and Common Manzanita (A. manzanita), Gray Pine (Pinus sabiniana) and Blue Oak (Quercus douglasii).

CX

UPPER MONTANE MIXED CHAPARRAL ALLIANCE

A mid elevation mixed chaparral type has been mapped occasionally at elevations up to about 7000 ft (2135 m) in the Foothills and Ranges Sections in this zone. The indicator shrubs of this alliance are Snowbrush (Ceanothus velutinus), Deerbrush (Ceanothus integerrimus), and Greenleaf Manzanita (Arctostaphylos patula) towards the north, and Mountain Whitethorn (Ceanothus cordulatus), Bush Chinquapin (Chrysolepis sempervirens), Cherry (Prunus spp.), and Gooseberry (Ribes spp.) towards the south. Trees associated with this Alliance include Gray Pine (Pinus sabiniana) and Douglas-fir (Pseudotsuga menziesii) in the west and Singleleaf Pinyon Pine (P. monophylla) and White Fir (Abies concolor) in the east. Canyon Live Oak (Quercus chrysolepis) is closely associated with this alliance in both sections.

JC

CALIFORNIA JUNIPER ALLIANCE

California Juniper (Juniperus californica) may take shrublike or arborescent forms. In this zone, its shrub form dominates these juniper sites and has been mapped sparsely in the Foothills Section, typically within an elevation band of about 2800 – 5600 ft (854 – 1708 m). These sites are usually on moderately steep to steep slope gradients and often in shallow or nutrient-poor soils. In this area of the state, California Juniper associates with Great Basin woody species such as Singleleaf Pinyon Pine (Pinus monophylla), Big Sagebrush (Artemisia tridentata), and Tucker Oak (Quercus john-tuckeri), in addition to other Oaks (Quercus spp.) and annual grasses and forbs.

LS

SCALEBROOM ALLIANCE

Scalebroom (Lepidospartum squamatum) becomes dominant in this Alliance at elevations between 1200 – 4200 ft (366 – 1280

m) in the Foothills Section, where it has been mapped very sparsely. This species favors gravelly soils and xeric washes. It sometimes occurs in the vicinity of shrubs of drier sites such as Chaparral Yucca (Yucca whipplei), Rabbitbrush (Chrysothamnus spp.), and California Buckwheat (Eriogonum fasciculatum) as well as Great Valley trees such as Blue Oak (Quercus douglasii) and Gray Pine (Pinus sabiniana).

ML

BACCHARIS (RIPARIAN)

This Alliance identifies one or more species of Baccharis that dominate riparian areas and wetlands. It has been mapped in a limited area along Caliente Creek and other sites in the Foothills Section at elevations between 1000 – 2200 ft (305 – 670 m). Species that may be in this Alliance include Mule Fat (B. salicifolia), Marsh Baccharis (B. douglasii), and Squaw Waterweed (B. sergiloides). This Alliance is found adjacent to upland species such as Interior Live Oak (Quercus wislizenii), Gray Pine (Pinus sabiniana), California Buckeye (Aesculus californica), Chaparral Yucca (Yucca whipplei), and Rabbitbrush (Chrysothamnus spp.) in this area.

RS

RIVERSIDEAN ALLUVIAL SCRUB ALLIANCE

Alluvial fans and dry washes in xeric, interior areas of the Foothills Section close to developed areas may contain a mixture of species, of which Scalebroom (Lepidospartum squamatum), California Buckwheat (Eriogonum fasciculatum), White Sage (Salvia apiana) and other shrubs and semi-woody shrubs may be prominent. Other species may be present, including Pricklypear (Opuntia spp.), Chaparral Yucca (Y. whipplei), California Juniper (Juniperus californica) and Rhus species. Annual grasses and forbs are common components of these dry sites, which have been mapped very sparsely on low-gradient slopes at elevations between about 3800 – 4200 ft (1158 – 1280 m) in this zone.

SB

BUCKWHEAT ALLIANCE

California Buckwheat (Eriogonum fasciculatum) is the dominant species of this interior Alliance. It has been identified frequently in the Foothills Section at elevations generally below 6000 ft (1830 m). These sites are often open or sparsely vegetated with annual grasses and forbs. Minor proportions of low-elevation trees such as Gray Pine (Pinus sabiniana), Blue Oak (Quercus douglasii) and Interior Live Oak (Q. wislizenii) and shrubs such as Wedgeleaf Ceanothus (C. cuneatus) may be present as well within and adjacent to these areas.

SD

MANZANITA ALLIANCE

The Manzanita Alliance consists of unknown species of Manzanita (Arctostaphylos spp.) or combinations of known species in which none is dominant. It has been mapped very sparsely in the three sections at a wide range of elevations from below 1000 ft (305 m) up to about 7000 ft (2135 m). Within this zone, species in this type can include either of the rare species Ione Manzanita (A. myrtifolia) in Amador County or Nissenan Manzanita (A. nissenana) in El Dorado and more southern foothill counties. These species may occur alone or in mixtures with Whiteleaf or Common Manzanita (A. viscida, A. manzanita). In the south end of the Valley, the species are more likely to be Eastwood Manzanita (A. glandulosa ssp. mollis) or Bigberry Manzanita (A. glauca). The Manzanita Alliance in the Tehachapi Mountains in the Foothills Section associates with xeric species such as Tucker Oak (Quercus john-tuckeri), Big Sagebrush (Artemisia tridentata), Singleleaf Pinyon Pine (Pinus monophylla) and Canyon Live Oak (Quercus chrysolepis).

SI

BLADDERPOD ALLIANCE

Areas where Bladderpod (Isomeris arborea) becomes dominant have been mapped very sparsely in the Foothills Section at elevations ranging from 400 – 4000 ft (122 – 1220 m). These sites tend to be either disturbed or on moderately to very steep xeric slopes. Annual grasses and forbs and Big Sagebrush (Artemisia tridentata) tend to be associated with this alliance in this area.

SY

CHAPARRAL YUCCA ALLIANCE

On occasion, Chaparral Yucca (Yucca whipplei), a common species of the Lower Montane Mixed Chaparral Alliance in southern California, becomes dominant on dry sites in this zone. Some of these areas are located within annual grasslands disturbed by over-grazing or have patches of bedrock outcrops that favor the growth of this species. However, this alliance has been mapped only rarely in the Foothills Section within the elevation range 1200 – 4600 ft (366 – 1402 m). Blue and Interior

Live Oaks (Quercus douglasii, Q. wislizenii), Gray Pine (Pinus sabiniana), California Buckwheat (Eriogonum fasciculatum) and annual grasses and forbs may also be present on these sites in minor amounts.

TS

SNOWBERRY ALLIANCE

Species of Snowberry (Symphoricarpos spp.) rarely dominate a site in this zone, but such areas have been mapped extremely sparsely in the Foothills Section at elevations around 5800 ft (1768 m). Mountain Snowberry (S. rotundifolius), the typical species at this altitude, occurs on rocky areas and forest openings adjacent to xeric types such as Singleleaf Pinyon Pine (Pinus monophylla), Big Sagebrush (Artemisia tridentata) and Tucker Oak (Quercus john-tuckeri) and other plants in the Eastside Pine Alliance.

WL

WILLOW (SHRUB) ALLIANCE

Shrub forms of Willow (Salix spp.) are mapped as this alliance where they dominate the shrub layer in a riparian, seep or meadow site. In this region, this type has been mapped very sparsely in scattered areas of the three sections at elevations below about 4200 ft (1280 m). This Alliance may include a combination of Narrow-leaved Willow (S. exigua), Shining Willow (S. lucida), and Yellow Willow (S. lutea) in association with other tree Willows. Grasses and grasslike plants such as Water Sedge (Carex aquatilis), Meadow Barley (Hordeum brachyantherum), Nebraska Sedge (C. nebrascensis), and Woolly Sedge (C. lanuginosa) may also be found on these wet sites associated with wet or moist meadows that may be adjacent to the Shrub Willow Alliance.

WM

BIRCHLEAF MOUNTAIN MAHOGANY ALLIANCE

Birchleaf Mountain Mahogany (Cercocarpus betuloides) will occasionally dominate an open site in this area on moderately steep to very steep mid-montane slopes. This alliance has been mapped very sparsely in the Ranges and Foothills Sections up to an elevation of about 6400 ft (1952 m). Shrub associates include others representative of the Lower Montane Mixed Chaparral type such as Wedgeleaf Ceanothus (Ceanothus cuneatus) and shrubby Oaks (Quercus spp.), in addition to California Buckwheat (Eriogonum fasciculatum). Hardwoods such as California Buckeye (Aesculus californica) and various tree Oaks (Quercus spp.) may be found in the vicinity of this alliance in addition to Singleleaf Pinyon Pine (Pinus monophylla) and annual grasses and forbs.

HERBACEOUS

HG

ANNUAL GRASSES AND FORBS ALLIANCE

Annual grasslands are the most commonly encountered type mapped in this zone, generally occurring between urban/agricultural developments and the foothill woodlands. The Annual Grasses and Forbs Alliance has been identified in most subsections in the three sections. Dominant species in this alliance include Western Needlegrass (Achnatherum occidentale), Cheatgrass (Bromus spp.), Purple Owl's Clover (Castilleja exserta), Filaree (Erodium spp.), Wild Oats (Avena spp.), and Devil's Lettuce (Amsinckia tessellata). Annual grasses extend from Redding to Bakersfield throughout the Central Valley.

Vernal pools (small depressions often containing hardpan soil layers) occur throughout the Annual Grasses and Forbs Alliance. Species within these vernal pools include Downingia (Downingia cuspidata), Meadowfoam (Limnanthes douglasii), Goldfields (Lasthenia chrysostoma), Water Starwort (Callitriche marginata), Popcorn Flower (Plagiobothrys spp.), Johnny-Tuck (Orthocarpus erianthus), Bur Medic (Medicago hispida), and Linanthus (Linanthus spp.).

HJ

WET MEADOWS ALLIANCE

Seasonally wet meadows and grasslands occasionally occur in this zone. They have been mapped sparsely in the three sections, occurring adjacent to dependable water sources such as springs and seeps. A diverse mixture of herbaceous species occur in the Alliance, including Sedges (Carex spp.), Rushes (Juncus spp.), Bulrushes (Scirpus spp.), perennial Bromes (Bromus spp.), Fescues (Festuca spp.), Bluegrass (Poa spp.), Reedgrass (Calamagrostis spp.), and herbaceous perennials such as False Hellebore (Veratrum spp.) and Shooting Star (Dodecatheon spp.).

HM

PERENNIAL GRASSES AND FORBS ALLIANCE

Perennial grasslands have been mapped very rarely in the Ranges and Foothills Sections of this zone. This type 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 Western Needlegrass (*Achnatherum occidentale*) may occur in addition to Squirreltail (*Elymus elymoides*), and Wild Rye (*Elymus* spp.). Introduced perennials such as Crested Wheatgrass (*Agropyron desertorum*) 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 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

Tule marshes may occur near lakes and springs but are rare in this area, having been mapped very sparsely in the Valley and Foothills Sections. Dominant species include Tule (*Scirpus* spp.), Cattail (*Typha* spp.), Lythrum (*Lythrum hyssopifolia*), and Spike Rush (*Heleocharis palustris*). A number of other species associate with this Alliance depending on the geographic area. Past drainage activities have significantly reduced the total area once covered by these species.

NON-NATIVE VEGETATION

IA

GIANT REED / PAMPAS GRASS ALLIANCE

This non-native alliance is dominated by invasive species of Giant Reed (*Arundo donax*) in wetlands or Black or White Pampas Grasses (*Cortaderia jubata*, *C. selloana*) on moist, disturbed sites. This type has been mapped very rarely in the Ranges Section. The adjacency of agricultural and urban land uses may provide a conduit for the invasion of these species onto public and private lands.

IB

URBAN-RELATED BARE SOIL

Urban development occurs in phases. When land is cleared prior to being paved, this category represents the occurrence of non-vegetated barren ground caused by the urbanization process. 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 near pavement. It has been mapped very sparsely in the Ranges Section. It occasionally has been used to designate buildings or other constructed entities.

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*, *C. 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.

IG

NON-NATIVE / ORNAMENTAL GRASS ALLIANCE

Ornamental or non-native grass species define this Alliance. 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. Other non-native conifers, shrubs, 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.

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. 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.

IW

DEVELOPED WATER FEATURES

Facilities for capture and storage of surface or ground waters are sometimes quite visible in developed landscapes and usually can be recognized easily on aerial photographs. One such site has been mapped in the Ranges Section of this zone. Such features as golf course ponds, basins for replenishment of aquifers, small lakes in public parks and reserves, water and sewage treatment facilities and the like are included in this category. They are often located in agricultural and rural areas, especially some water treatment operations.

LAND USE AND NON-VEGETATED CLASSES

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. Land used exclusively for livestock pasture may, however, be mapped as annual grassland in those cases in which land uses are not recognizable.

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 of land in California. Occasionally, shrub forms may become horticulturally trained to resemble small trees, such as filberts.

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 such as squash, celery, beans, peas, etc. for stock 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 (Linseed and Cottonseed Oils), fibers and medicinal uses, if any.

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 does include quarries and open pit mines.

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.

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 will be mapped according to their terrestrial dominant vegetation types.

SECONDARY MAPPING SOURCES IN ZONE 5

Other data sources have been used in this zone to augment mapping originated by the Remote Sensing Lab or its contactors. These were used to fill in areas that had not been mapped by RSL, which are considerable in this zone. Limited structural information or accuracy assessment is 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 metadata and map attributes in the crosswalked data sources in this zone. They are indicated as occurring within specific subsections, as indicated by numbers and their corresponding names in the subsequent section. General descriptions follow the types that have not been described above.

A2 VINEYARD – SHRUB AGRICULTURE

Subsection(s) 5, 6, 7, 8, 9, 10, 11, 21

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

Subsection(s) 1, 5, 7, 8, 9, 11, 12, 14, 15, 16, 18, 21

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

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25

See description above

A5 FLOODED ROW CROP AGRICULTURE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13, 14, 15, 20, 21, 22, 23

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

Subsection(s) 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24

See description above

A7

AGRICULTURE PONDS / WATER FEATURES

Subsection(s) 14

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)

Subsection(s) 7, 8, 9, 11

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.

AK

ALKALINE FLATS

Subsection(s) 7, 8, 9, 11

Small barren areas in dry, inland locations in this zone have been crosswalked to 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.

BA

BARREN

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24

See description above

BC

SALTBUSH ALLIANCE

Subsection(s) 5, 9, 11, 13, 14, 15, 16, 17, 18, 19

See description above

BR

RABBITBRUSH ALLIANCE

Subsection(s) 5, 25

See description above

BS

BIG SAGEBRUSH ALLIANCE

Subsection(s) 19, 26

See description above

CA
CHAMISE ALLIANCE

Subsection(s) 21

See description above

CK
COYOTE BRUSH ALLIANCE

Subsection(s) 5, 7, 8, 9, 11

Coyote Brush (Baccharis pilularis) may be the main shrub of certain moist, near-coastal areas of northern California, increasing in dominance towards the San Francisco Bay area. It also pioneers recently logged sites at some distance from the coast.

CQ
LOWER MONTANE MIXED CHAPARRAL ALLIANCE

Subsection(s) 5, 6, 18, 19, 21, 25, 26

See description above

CS
SCRUB OAK ALLIANCE

Subsection(s) 19, 26

See description above

EX
COASTAL MIXED HARDWOOD ALLIANCE

Subsection(s) 9

Sites often have a mixture of hardwoods with no clearly dominant single species. The indicator species of this westernmost mixed hardwoods alliance is Coast Live Oak (Quercus agrifolia). It occurs in mixture with others of lower abundance, such as Blue Oak (Quercus douglasii), Valley Oak (Quercus lobata), California Bay (Umbellularia californica), and Black Oak (Quercus kelloggii). The Coastal Mixed Hardwoods Alliance has been identified and extensively mapped in areas to the west of this zone, but only sparsely here.

HA
ALKALINE MIXED GRASSES AND FORBS ALLIANCE

Subsection(s) 5, 6, 7, 8, 9, 11

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 crosswalked sparsely as the Alkaline Mixed Grasses and Forbs Alliance.

HC
PICKLEWEED - CORDGRASS ALLIANCE

Subsection(s) 8, 9, 11

Brackish or salt marshes commonly occur west of this zone closer to the coast but have been crosswalked in these zone as a result of the prevalent Sacramento Delta influence. Usually dominated by Common Pickleweed (Salicornia virginica) and California Cordgrass (Spartina foliosa), coastal salt marshes also may include invasive non-native species such as Salt Water and Dense-flowered Cordgrasses (Spartina alterniflora, Spartina densiflora) in northern California. Jaumea (Jaumea carnosa) and Saltgrass (Distichlis spicata) are also associated with these wet sites.

HG
ANNUAL GRASSES AND FORBS ALLIANCE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26

See description above

HJ

WET MEADOWS ALLIANCE

Subsection(s) 5, 8, 9, 14, 15, 18, 23, 24

See description above

HM

PERENNIAL GRASSES AND FORBS ALLIANCE

Subsection(s) 1, 2, 3, 5, 6, 7, 8, 9, 11, 13, 14, 16, 18, 19, 20, 21, 22, 23

See description above

HT

TULE - CATTAIL ALLIANCE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23

See description above

IA

GIANT REED

Subsection(s) 1, 5, 7, 8, 9, 11, 14, 20

See description above

IB

URBAN-RELATED BARE SOIL

Subsection(s) 1, 5, 7, 8, 9, 11, 12, 19, 20, 21, 22

See description above

IC

NON-NATIVE / ORNAMENTAL CONIFER ALLIANCE

Subsection(s) 22

See description above

IF

NON-NATIVE / INVASIVE FORB / GRASS ALLIANCE

Subsection(s) 5, 7, 8, 9, 11, 13, 14, 20

Riparian and upland areas are sometimes invaded by aggressive herbaceous species that are not native to this state or area. 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 Star thistle (*Centaurea solstitialis*), which is also toxic to horses and poses a challenge to eradicate, and many other Knapweeds (*Centaurea* spp.). This type may also reflect managed meadows or urban plantings, such as in parks.

IG

NON-NATIVE / ORNAMENTAL GRASS ALLIANCE

Subsection(s) 1, 4, 5, 7, 8, 9, 11, 15, 16, 21, 22

See description above

IH

NON-NATIVE / ORNAMENTAL HARDWOOD ALLIANCE

Subsection(s) 1, 5, 6, 7, 8, 9, 10, 11, 20, 21, 22

See description above

IM

NON-NATIVE / ORNAMENTAL CONIFER / HARDWOOD ALLIANCE

Subsection(s) 1, 5, 9, 22

See description above

IS

NON-NATIVE / ORNAMENTAL SHRUB ALLIANCE

Subsection(s) 1, 2, 4, 5, 6, 7, 8, 9, 11, 20, 22, 23

See description above

IW

DEVELOPED WATER FEATURES

Subsection(s) 1, 6, 8, 20, 21

See description above

JT

CALIFORNIA JUNIPER (TREE)

Subsection(s) 19, 26

The tree form of California Juniper (*Juniperus californica*) has been crosswalked in the southernmost areas of this zone (Elk Hills and South Valley Terraces and San Emigdio Mountains Subsections). This large shrub to small tree does well on shallow and otherwise infertile soils and at relatively low elevations.

NA

ALKALINE MIXED SCRUB ALLIANCE

Subsection(s) 8, 9, 11

More extensively mapped in the South Interior Calveg zone, this alliance has been crosswalked in this zone in xeric areas are associated with halophytic shrubs such as Saltbush (*Atriplex* spp.).

NC

NORTH COASTAL SCRUB ALLIANCE

Subsection(s) 9

Shrubby near-coastal areas of northern California having no clear single dominant shrub species are identified in the North Coastal Scrub Alliance. In this zone, this type has been crosswalked to identify areas having an abundance of either Coyote Brush (*Baccharis pilularis*), species of lupine such as Yellow Bush Lupine (*Lupinus arboreus*) and others such as Blueblossom (*Ceanothus thyrsiflorus*) and Coast Whitethorn (*C. incanus*).

NM

RIPARIAN MIXED SHRUB ALLIANCE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 20, 22, 23

This type represents a community of shrubs in riparian, seep and moist meadow sites in which no single species achieves dominance in the mapped area. The Riparian Mixed Shrub Alliance usually has a permanent water source at the surface that provides moisture to its obligate hydrophytes such as shrub Willows (*Salix* spp.), or shrubby Alders. Shrubs requiring shade or generally moist conditions, such as Blackberry or Gooseberry species (*Rubus* spp., *Ribes* spp.) and Elderberry (*Sambucus* spp.), may also be included in this mixture.

NR

RIPARIAN MIXED HARDWOOD ALLIANCE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 14, 16, 20, 21, 22, 23

See description above

NX

INTERIOR MIXED HARDWOOD ALLIANCE

Subsection(s) 9, 21, 22

See description above

PD

GRAY PINE ALLIANCE

Subsection(s) 4, 5, 6, 10, 21, 23

See description above

PJ

SINGLELEAF PINYON PINE ALLIANCE

Subsection(s) 19, 26

See description above

QA

COAST LIVE OAK ALLIANCE

Subsection(s) 7, 8, 9, 11

See description above

QD

BLUE OAK ALLIANCE

Subsection(s) 1, 2, 5, 6, 10, 14, 18, 19, 21, 22, 23, 24, 25, 26

See description above

QE

WHITE ALDER ALLIANCE

Subsection(s) 7, 8, 9, 11

See description above

QF

FREMONT COTTONWOOD ALLIANCE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 20, 22, 23

See description above

QL

VALLEY OAK ALLIANCE

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 21, 22, 23, 24, 26

See description above

**QO
WILLOW ALLIANCE**

Subsection(s) 1, 3, 5, 6, 7, 8, 9, 10, 11, 14, 20, 21, 22

See description above

**QP
CALIFORNIA SYCAMORE ALLIANCE**

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 20, 21, 22, 23, 24

See description above

**QV
BLACK WALNUT ALLIANCE**

Subsection(s) 6, 7, 8, 11, 21

California Black Walnut (Juglans californica), a species endemic to the state, historically occurred in restricted ranges of northern, central, and southern California. Due to its high value for erosion control, wildlife cover and nutritional needs, it has been planted widely by Native Americans and later settlers and has become naturalized in the Central Valley. In addition, extensive hybridization has occurred with the eastern black walnut (J. nigra) in this area.

**QW
INTERIOR LIVE OAK ALLIANCE**

Subsection(s) 1, 5, 10, 19, 22, 23

See description above

**QY
WILLOW - ALDER ALLIANCE**

Subsection(s) 1, 5, 14, 22, 23, 24

This Alliance includes any tree species of Willow (Salix spp.) combined with White or Mountain Alders (Alnus rhombifolia, A. incana ssp. tenuifolia) occurring together in stream or seepage areas where neither is clearly dominant in the riparian mixture. Shrubs such as species of Gooseberry and Currant (Ribes spp.), Blackberry and other edible berries (Rubus spp.), Wild Rose (Rosa spp.) and Poison Oak (Toxicodendron diversilobum) along with various graminoids and forbs are likely to be present on these sites.

**QZ
EUCALYPTUS ALLIANCE**

Subsection(s) 1, 3, 5, 6, 7, 8, 9, 11, 20, 21, 22

See description above

**SB
BUCKWHEAT ALLIANCE**

Subsection(s) 11

See description above

**SE
ENCELIA SCRUB ALLIANCE**

Subsection(s) 11

This Alliance is dominated by either the shrubs Brittlebush (Encelia farinosa) and/or Acton's Brittlebush (E. actonii), tolerant of arid environments in the coast or desert and/or the more coastal California Encelia (E. californica). The Encelia Scrub Alliance is uncommon in this zone and has been crosswalked only in one area towards the west. The associated species may include California Sagebrush (Artemisia californica), California Buckwheat (Eriogonum fasciculatum), Coast Cactus (Opuntia littoralis), and Lemonade berry (Rhus integrifolia).

SI BLADDERPOD ALLIANCE

Subsection(s) 19

See description above

SL COASTAL LUPINE ALLIANCE

Subsection(s) 11

Dune Lupine (*Lupinus chamissonis*), a California native, is an indicator species for this Alliance in coastal dunes in southern California. The vegetated dune environments that have been crosswalked in this zone refer to those in the Antioch Dunes National Wildlife Refuge in the Westside Alluvial Fans and Terraces Subsection. These aeolian inland sand deposits along the San Joaquin River are part of a larger depositional field formed during the last and earlier Pleistocene retreating glaciations in eastern Contra Costa County. They have been extensively manipulated, lost to industrial uses, replanted and managed for different purposes through the centuries. Current vegetation on the partially and fully stabilized sand dunes include the Silver Bush Lupine (*L. albifrons*), subshrubs such as California Croton (*Croton californicus*) and Deerweed (*Lotus scoparius*) and many herbaceous and graminoid species, including several rare and endangered species in need of protection.

SQ SOFT SCRUB - MIXED CHAPARRAL ALLIANCE

Subsection(s) 11, 16, 18, 19, 25

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 crosswalked in western sections of this zone to represent the mixtures of subshrubs such as California Sagebrush (*Artemisia californica*), California Buckwheat (*Eriogonum fasciculatum*), White Sage (*Salvia apiana*) and Deerweed (*Lotus scoparius*), with more woody shrub species such as 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*).

TX MONTANE MIXED HARDWOOD ALLIANCE

Subsection(s) 4, 5, 10, 14, 19, 23, 24, 26

See description above

UB URBAN OR DEVELOPED

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24

See description above

UT TAMARISK ALLIANCE

Subsection(s) 6, 16

Any of various species of the introduced and invasive hardwood or tall shrubby Tamarisk (*Tamarix* spp.) are dominant in this semiarid riparian alliance. Active Tamarisk eradication programs cite the loss of riparian habitat due to the invasion of streams and washes and depletion of water sources by these aggressive plants. It has been crosswalked from other sources in the Yolo Alluvial Fans and Terraces and Panoche and Cantua Fans and Basins Subsections.

VP VERNAL POOL ALLIANCE

Subsection(s) 6, 7, 8, 11

Although diverse in composition and substrate, Vernal Pools are likely to be found in lower basin sites within grassy meadows in the Central Valley underlain by restricting subsurface layers such as iron-silica cemented soil hardpans, semi-permeable clay soils, volcanic mudflows, impermeable calcareous caliche and the like. Spring precipitation and runoff collects in these areas

and dries up in summer to support a variable range of short-lived herbaceous species such as Navarretia spp., Downingia spp., Tidytops (Layia spp.), Goldfields (Lasthenia spp.), Meadowfoam (Limnanthes spp.), Milkvetch (Astragalus spp.), Popcorn Flower (Plagiobothrys spp.), Woollyheads (Psilocarphus spp.) and graminoids such as Orcutt Grass (Orcuttia spp.), Rushes (Juncus spp.), Bentgrass (Agrostis spp.) and Vernal Barley (Hordeum intercedens). Active small shrimp and other invertebrates are often found on these sites during the few weeks when these pools are moist. Formerly extensive, they are endangered on private lands due to urbanization and agricultural uses.

WA WATER

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20, 22, 23, 24, 25

See description above

Surface water bodies have been crosswalked under the following categories:

W1: Rivers and Streams (natural, flowing surface waters)

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 14, 18, 20, 22, 23

W2: Perennial Lakes and Ponds

Subsection(s) 1, 5, 7, 8, 9, 10, 11, 14, 23

W3: Reservoirs (man-made lakes and ponds)

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 18, 20, 21, 24

W4: Bays or Estuaries (near-shore ocean features)

Subsection(s) 8, 9, 11

W6: Intermittent Stream Channel (seasonally flowing channeled waters)

Subsection(s) 21

W8: Intermittent or Seasonal Lake or Pond (occasionally drained surface waters)

Subsection(s) 2, 3, 5, 8, 9, 11, 12, 14, 15, 16

W9: Exposed Non-water Features (gravel, sand bars, cliff faces, etc.)

Subsection(s) 1, 2, 3, 4, 5, 6, 7, 20, 21, 22, 23

WL WILLOW (SHRUB) ALLIANCE

Subsection(s) 1, 5, 6, 7, 8, 9, 11, 21, 22

See description above

Sections and Subsections

262A - Great Valley Section

1. North Valley Alluvium (262Aa)
2. Butte Sink - Sutter Basin (262Ac)
3. Colusa Basin (262Ad)
4. River Alluvium (262Af)
5. Hardpan Terraces (262Ag)
6. Yolo Alluvial Fans (262Ah)
7. Yolo - American Basins (262Ai)

8. Sodic Claypan Terraces (262Aj)
9. Delta (262Al)
10. Camanche Terraces (262Ao)
11. Westside Alluvial Fans and Terraces (262Aq)
12. Manteca - Merced Alluvium (262As)
13. San Joaquin Basin (262At)
14. Granitic Alluvial Fans and Terraces (262Au)
15. Tulare Basin (262Av)
16. Panoche and Cantua Fans and Basins (262Aw)
17. Antelope Plain (262Ax)
18. South Valley Alluvium and Basins (262Ay)
19. Elk Hills and South Valley Terraces (262Az)

M261C - Northern California Interior Coast Ranges Section

20. Tehama Terraces (M261Cb)
21. Dunnigan Hills (M261Cc)

M261F - Sierra Nevada Foothills Section

22. Tuscan Flows (M261Fa)
23. Lower Foothills Metamorphic Belt (M261Fb)
24. Lower Granitic Foothills (M261Fc)
25. Southern Granitic Foothills (M261Fd)
26. San Emigdio Mountains (M261Fe)