

## Chapter 4 Environmental Setting

### 4.1 Regional Setting - Bioregion Overview

#### 4.1.1 Introduction

The environmental setting of the Vegetation Treatment Program (VTP) is diverse; from conifer and hardwood forest and woodlands in the mountain and coastal areas, to shrub and herbaceous rangelands in the south coast, north interior and central valley, to desert habitats in the southeast (CAL FIRE, 2010). Covering such an extensive and heterogeneous region, VTP projects will reflect the needs of the vegetation at the local and regional levels.

Forests cover about one third of California (CAL FIRE, 2010). Forests are lands with at least 10 percent cover of live trees as interpreted from satellite imagery. Rangelands are all unfertilized lands with vegetation suitable for grazing domestic livestock for at least part of the year. Together, forest and rangeland cover types cover nearly 81 million acres in the state (CAL FIRE, 2010).

Individuals, Laws and public agencies through ownership, management direction, and interaction with private landowners play a strong role in shaping natural systems. Nearly all VTP projects will occur on forest and rangelands in private ownership. Federal management activities influence the environmental setting on neighboring forest and rangelands adjacent to those under the jurisdiction of CAL FIRE. Approximately 37 million acres are within CAL FIRE's fire protection and fuels treatment jurisdiction. Table 4.1.1 shows the area of land cover type by owner group. These lands are managed for a variety of purposes, including recreation, open space, and ecological services and goods.

<b>Vegetation Type</b>	<b>Private</b>	<b>USFS</b>	<b>BLM</b>	<b>NPS</b>	<b>Other Public</b>	<b>NGO</b>	<b>Total</b>
Conifer Forest	6,653	10,762	346	1,106	434	34	19,335
Conifer Woodland	466	989	469	317	137	21	2,399
Hardwood Forest	2,828	1,305	194	104	151	12	4,594
Hardwood Woodland	4,296	284	193	19	456	45	5,293
Herbaceous*	9,370	376	433	82	733	157	11,151
Shrub	4,842	5,806	2,353	282	1,180	60	14,523
Desert Shrub	3,467	133	10,173	4,298	4,261	24	22,356
Desert Woodland	73	4	277	473	64	3	894
<b>Total</b>	<b>31,995</b>	<b>19,659</b>	<b>14,438</b>	<b>6,681</b>	<b>7,416</b>	<b>356</b>	<b>80,545</b>

\*Includes wetlands

#### Urban Forests and Rangelands

Urban forests and rangelands are those native or introduced trees and related vegetation in cities and towns and near urban areas, including, but not limited to urban watersheds, soils and related habitats, street trees, park trees, residential trees, natural riparian habitats, and trees on other private and public properties. More than half of all Californians live in two large metropolitan areas of at least 50,000 inhabitants. The remaining 24 metropolitan areas include approximately 90

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percent of all residences in California (Bureau, U.S.C., 2011). Urban forests and rangeland have a wide variety of management objectives, including wildlife and ecological preserves, regional parks, ranch lands, and private timber management operations. In these areas, the individual management decisions of thousands of landowners determine the overall mix of outputs and the levels of risk from other threats such as invasive species, diseases, and catastrophic wildfire. Difficulties in planning in urban forests and rangelands can be large, due to the considerable number of owners and the shared authority between local, state, and federal agencies.

### 4.1.2 Land Management on Forest and Range Lands

#### Laws and Public Agencies

The body of laws regulating California's forest and rangelands is complex. At least 50 federal laws, 20 executive orders (or other federal policy directives) and nearly 40 state laws provide the legal framework (CAL FIRE, 2003). A number of county, state and federal agencies are charged with enforcing statutes and regulating resource use and extraction activities on these lands. The result is an often overlapping system of jurisdictions and regulations of land management, which can make it difficult for private land managers to meet all standards and laws and develop economically. Federally managed lands come under the jurisdiction of federal laws and regulations, whereas management of private and state-controlled land needs to comply with state, county and local laws and regulations, as well as some federal statutes.

#### Federal Agencies

The federal agencies managing substantial forest and rangeland areas of California are the U.S. Department of Agriculture Forest Service, the U.S. Department of the Interior's Bureau of Land Management (BLM), National Park Service (NPS), Bureau of Indian Affairs (BIA), and the Department of Defense (DoD) (Table 4.1.2).

Land management activities on California's 18 national forests are guided by Land and Resource Management Plans ("forest plans") developed by and for each forest in compliance with the Forest and Rangeland Renewable Resources Planning Act (RPA) and the National Forest Management Act (NFMA), as well as the National Environmental Protection Act (NEPA) and all other federal and state laws that apply. Forest plans are the official documents that describe the full spectrum of program-level management activities scheduled to occur in that national forest jurisdiction within the planning cycle. These include timber harvest levels and locations, any road building and/or removal, forest wildfire fuels mitigations, invasive weed control, livestock grazing allotments, recreational facilities maintenance and improvement, etc. Forest plans are normally updated on a 10-year cycle.

Section 202 of the Federal Land Policy Management Act (FLPMA), enacted in 2002, provides the principles that guide BLM land management plans and activities. The BLM employs an ad hoc approach to proposing and implementing Resource Management Plans (RMPs) governing its use of the 262 million acres it administers in the western United States. These plans describe lands that can be used for livestock grazing and the parameters under which grazing can occur. In mid-2006, BLM issued amended rules regarding aspects of its rangeland program (BLM et al., 2006).

The National Park Service (NPS) has 23 parks, monuments, recreation areas, and seashores across all regions of California. Lands in these parks cover a wide variety of forest and range

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ecosystems. The National Park Service manages lands primarily to provide recreational opportunities and ecological services. Some parks have plans which detail specific resource management activities, such as Yosemite National Park's recent Fire Management Plan. As timber extraction and grazing (and related activities) are prohibited in National Parks, only those NPS plans related to vegetation management and fuels mitigation have bearing on the proposed VTP.

### State Agencies

The California Department of Fish and Game (DFG) manages over 600,000 acres of land with forest and rangeland settings and includes bighorn sheep habitat, deer habitat, grassland/upland habitats, special habitats, and threatened and endangered habitats. These lands are managed primarily for habitat, recreation, and ecological services. Just over half of the lands managed by California Department of Parks and Recreation can be considered to have settings associated with forest and rangeland ecosystems. The California Department of Forestry and Fire Protection (CAL FIRE) manages eight demonstration forests covering over 71,000 acres. These are primarily forestland habitats, but do contain some range. State forests are managed for a variety of purposes. Conservancies covering the largest land acreage are the Sierra Nevada Conservancy, Coachella Mountains Conservancy, and San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy. The main focuses of all these conservancies are to protect, preserve, and enhance natural habitat corridors while providing public access and recreational opportunities (CAL FIRE, 2003).

### Local Agencies

A portion of these lands, especially city parks, are developed settings with irrigated grass and other developed facilities. Wildland local parks are predominately found in the Bay/Delta, Central Coast, and South Coast bioregions and are particularly prevalent in areas adjacent to the Bay Area, Los Angeles, Orange, and San Diego County urban areas. Local parks with wildland settings and forest and rangeland vegetation are only a part of the total acres of local parks listed (Table 4.1.2). Local park acreage is considerably less extensive in the more rural regions of California that already have large areas of federal land.

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<b>Table 4.1.2 California Land Management</b>	
<b>Federal</b>	<b>Acres</b>
Forest Service	20,764,000
Bureau of Land Management	15,159,000
National Park Service	7,621,000
Bureau of Indian Affairs	438,000
Department of Defense	3,995,000
<b>State</b>	
Dept. of Parks and Recreation	1,339,000
Dept. of Forestry and Fire Protection	72,000
Dept. of Fish and Game	1,148,958
<b>Local Parks</b>	
City Parks	693,000
County Parks	316,000
District Parks	558,000
<b>Conservancies</b>	
Baldwin Hills Conservancy	1,200
Tahoe Conservancy	148,000
Coachella Valley Mountains Conservancy	2,000
San Joaquin River Conservancy	5,900
Santa Monica Mountains Conservancy	9,000
State Coastal Conservancy	1,000
San Diego River Conservancy	300,000
Sierra Nevada Conservancy	25,000,000
San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy	569,000

Source: California Protected Areas Database, GreenInfo Network, 2011 , CAL FIRE, 2011

### 4.1.3 Range Setting

#### ***Landbase and Ownership***

The majority of California's working landscapes are rangelands. These lands are primarily managed for commodity production and/or services. "Rangelands" or "primary rangelands" include the area of all rangelands, regardless of availability, with suitable vegetation for grazing livestock, excluding conifer forests and upland hardwood forests associated with conifer forests. Included in these lands, however, are some conifer woodland types – typically semi-arid highland areas with

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very open canopies dominated by pinyon pine and/or juniper and sagebrush. In California, there are substantial areas of forest land particularly within the U.S. Forest Service (USFS) grazing allotments. Though these allotments are often used for grazing, they are not shown in the estimate because forage output is transient, often only related to areas with little tree cover following harvesting or fire. These lands are termed secondary rangeland and limited information on grazing activities and other measures related to condition are provided. “Primary rangelands” by cover type are depicted in Figure 4.1.1.

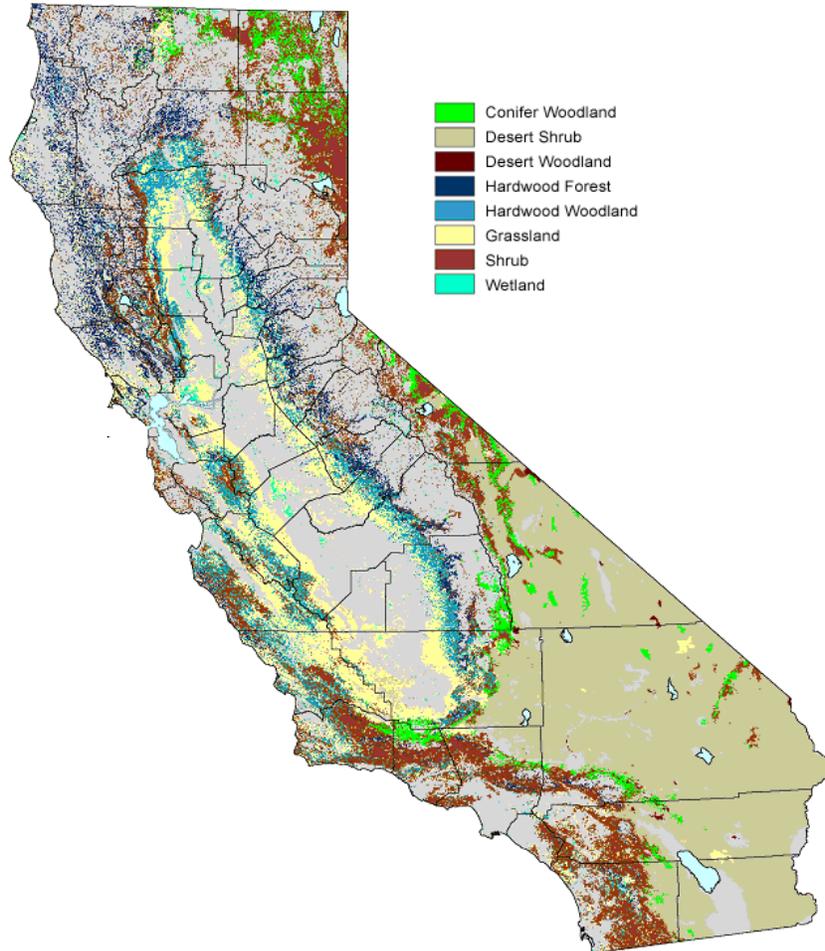


Figure 4.1.1 Primary Rangeland by Vegetation Cover Type

A majority of rangelands are in public ownership, with the Bureau of Land Management being the largest public land managing agency. Forty-three percent of rangeland habitats within California are privately owned while 57 percent are publicly owned. This ownership pattern varies among the bioregions of the State.

### ***Management by private landowners***

The largest group of private landowners managing rangeland is the range-livestock community. This class of owners may include land owners who have conservation easements or similar

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arrangements. Data comes from the USDA National Agricultural Statistics Service as part of their five-year national census.

Characteristics of rangeland owners seem to be approximated best by the category of “beef cattle (except feedlots)”. In 1997, there were over 11,500 beef cattle farms (excluding feedlots) in California. Nearly 72 percent of these farms statewide are less than 500 acres in size.

Sole proprietorship is by far the most common form of ownership in all farms, including those with cattle sheep and goats. Partnerships are the second most common ownership, with family-held corporations next. In 1997, about three quarters of all farms were in sole proprietorship. About 85 percent of farms reported as beef cattle (except feedlots) are sole proprietorships.

### **Forage Use**

The range livestock industry utilizes cropland, woodland, and pasture/range for forage. Both private and public lands may be grazed. Ranches may use some or all of these resources. Farms greater than 2,000 acres had a greater dependence on pasture/range other than cropland or woodland for grazing than smaller farms.

About 60% (34.1 million acres) of all available rangeland is grazed by livestock in California. Ninety percent of total range forage grazed each year by livestock comes from private lands (where the VTP will function), with the remainder coming from federally managed lands such as the BLM. Although private lands are much more productive (due to grasslands, better growing conditions, low elevation, year-round grazing), they comprise less than half (41%) of the total rangeland grazed by livestock as shown in Table 4.1.3.

<b>Rangeland Vegetation Type</b>	<b>Private</b>	<b>USFS</b>	<b>BLM</b>	<b>NPS</b>	<b>Other Public</b>	<b>NGO</b>	<b>Total</b>
Shrublands (chaparral, sagebrush)	4,842	5,806	2,353	282	1,180	60	14,522
Grasslands	9,525	376	433	82	831	159	11,407
Desert types	3,540	137	10,450	4,772	4,325	27	23,251
Conifer Woodland	466	989	469	317	137	21	2,399
Hardwood Woodland	4,296	284	193	19	456	45	5,292
Hardwood Forest	2,828	1,305	194	104	151	12	4,594
<b>Total</b>	<b>25,497</b>	<b>8,897</b>	<b>14,092</b>	<b>5,576</b>	<b>7,080</b>	<b>324</b>	<b>61,465</b>

Source: CAL FIRE, 2010

Grassland vegetation provides the most important source of forage for grazing livestock. Other important vegetation types for grazing are Hardwood Woodland and Hardwood Forests, which often occur adjacent to grasslands and have an understory of grasses. Livestock grazing occurs on land subject to private and public permits. In the last decade, the amount of authorized grazing has declined on federal land (CAL FIRE, 2010).

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### 4.1.4 Environmental Factors on Rangeland

#### Riparian Areas

While only a portion of total precipitation falls on California rangelands, almost all surface water in California passes through rangeland at some point in its cycle. In addition, two-thirds of the major reservoirs are located on rangeland. Therefore, rangeland hydrology greatly influences the quality of California's surface waters. The grazing activities conducted on rangelands and their effects on soil and water quality are of particular concern for maintaining hydrological function.

The impact grazing has on surface hydrologic conditions depends primarily on the behavior of the livestock, including feeding, drinking and waste production, and traveling. The timing and the intensity of grazing also have an impact. The resultant effects of these behaviors can lead to excessive vegetation removal (over-grazing), potential erosion due to soil baring, accelerated channel bank erosion due to trampling, stream temperature increase due to removal of riparian vegetation, water pollution from direct nutrient and pathogen deposits, and habitat degradation in wet meadow areas (Dahlgren et al., 2001). Key issues related to water quality are cost effective management of riparian zone grazing practices.

#### Plant Community Composition

Plant community composition is the species type, structure (size and density), and diversity of vegetation on rangeland. The ability of a rangeland site to support these characteristics, resist loss of function and structure, and recover help define rangeland condition from a vegetative perspective. Major changes have occurred to rangeland plant composition since the late 1800s and society's heavy demand on resources (Menke et al., 1996). Historic changes in rangeland vegetation, primarily for the Sierra bioregion, were marked by substantial over-grazing, introduction of large fires for forage improvement and unrestricted livestock foraging in riparian areas. Substantial changes have taken place to recover the Sierra rangelands during the last two decades, including a slow recovery of upland wet meadows and re-vegetation of riparian areas following improvements in grazing practices.

#### Hardwood Range Condition Changes

California's hardwood rangelands are the nearly 10 million acres of hardwood forests and woodlands that are composed primarily of oak tree species but may also contain other hardwood tree species as well. The annual and perennial grasses found within California's hardwood rangelands are an important source of rangeland forage for California's livestock industry. These lands are generally located adjacent to the Sacramento Valley, San Joaquin Valley, and smaller coastal valleys within the Coast Range. While mapping efforts directed at California's hardwood rangelands are useful for translating vegetation condition into wildlife habitat values, they are less useful as assessment tools when measuring condition variables such as rangeland forage, soil, and water quality. As such, soil and water quality conditions and trends are poorly quantified across hardwood rangelands.

Livestock grazing has both positive and negative influences on hardwood rangeland condition. Positive influences include reduction in moisture competition between oak seedlings and annual grass species as well as reduction in fine fuels that influence fire spread rates. Negative influences

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on hardwood rangelands include potential for increased soil compaction, alteration of stream hydrologic function, and direct impact on oak seedling regeneration. Some recent findings by IHRMP on sustainable practice research include canopy management of oak for improved forage yields and appropriate methods measuring the utilization of rangelands.

Historically, ranchers removed oaks as a means to increase forage production by reducing competition for limited amounts of moisture and sunlight. Most studies on this topic have demonstrated that increased forage production is possible in rangelands dominated by blue oak (*Quercus douglasii*) if precipitation exceeded 20 inches per year and tree canopy cover exceeded 25 percent of total area. In areas with less than 20 inches of rainfall and less than 25 percent canopy cover, forage yields were greater than adjacent open grassland areas. Moderate blue oak canopy cover (25 to 60 percent) had a variable effect on forage production.

Current research on this topic concludes that the benefits of oak removal generally decline within 15 years due to the loss of an organic matter source sustaining soil quality and the disruption of the nutrient cycling processes. Conversely, there has been little impact on soil quality under light to moderate grazing pressures given organic matter inputs from grazing livestock. In addition, during periods of drought, the shading provided by an oak canopy results in longer retention of soil moisture, thus maintaining green forage for a longer period into the dry season.

### Condition of non-federal annual grasslands

Annual grasslands provide approximately 84 percent of the forage used for domestic livestock grazing on California's forests and rangelands (CAL FIRE, 2003). This percentage includes annual grassland as well as the annual grass understory component of valley and foothill woodland, coastal scrub, and chaparral land cover types. Early assessments mandated by Congress (e.g., Renewable Resources Planning Act, and Soil and Water Resource Conservation Act) reported California's annual rangelands to be in "poor" condition. This conclusion was based on an evaluation of California's grasslands according to perennial grassland standards. In these standards, assessment criteria and methods place annual-dominated plant communities into lower condition classes. The plant succession concepts and application methods developed for perennial grassland (such as Midwestern prairies) are not sufficiently similar to the annual grassland ecosystem function to allow comparison.

### Development on Rangelands

Rangelands have faced disproportionate development and conversion pressure relative to other vegetation and land cover types in the state (CAL FIRE, 2010). Outside of the less-productive desert and other arid regions, rangeland is often found on easily developed rolling terrain near sea level or at low elevations, and frequently surrounds what have become urban and suburban areas. Moreover, the majority of areas that now comprise the great metropolitan areas in the state, such as in and around Los Angeles, San Diego, the Inland Empire and San Francisco's south and east bay, were nearly all originally covered in rangeland vegetation types.

The trend of rangeland at risk from development has continued. A recent study of ecosystems determined that rangeland types appears as the top two (and five out of the top six) WHR types at risk from development (CAL FIRE, 2010). The study overlaid spatially-explicit population projection data from the EPA with WHR and tree seed zone delineations to rank areas as low medium or high.

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The areas most at-risk were determined to be at the periphery of the main metropolitan areas, where the large urban and suburban growth is most likely going to occur.

### 4.1.5 Economic Importance

Despite rangelands covering approximately 54 percent of California, agriculture and its livestock sub-sector have declined in relative importance within the state's economy. The declining relative importance of goods production and a rise in services, trade, finance and other non-goods producing activities are characteristic of the structural change that swept the nation and the region in latter half of the twentieth century. Even with this structural transformation California has been the nation's largest dairy producer since 1993, and accounted for 21 percent of the nation's milk supply in 2009.

In 2009, total cash receipts for sheep and lambs were about \$37 million, representing an increase from 2007 levels, but an overall downward trend of close to 40 percent from the 2000 levels. In 1990, 39 California counties had cattle and calf production values (beef and dairy) within their top five agricultural commodities. In 2009, 31 counties listed cattle and calf production by value as among their top five agricultural products. California's cattle and calf commodity was the fifth leading agricultural production commodity by gross value for the state in 2009, surpassed by milk and cream, grapes, nursery products, and almonds. The five leading counties for cattle and calf production and their percent of state total were Tulare (17.9%), Fresno (13%), Imperial (12.4%), Merced (9.3%), and Kern (7.5%). The five leading counties for sheep and lamb production and their percent of state total included Fresno (19.6%), Solano (12.2%), Kern (12%), Imperial (10.4%), and Merced (5.2%). While each of these counties contains open rangeland, a large portion of their contribution comes from production in feedlots.

Sales of beef cattle comprise over 90 percent of the income generated from livestock operations. However, prices for sheep, cattle, meat, wool, and other products tend to reflect global markets, trade factors, and other conditions. There is a high degree of integration in the North American cattle market. U.S. cattle inventories exceed Canadian inventories by almost ten-fold; inventory highs and lows tend to parallel each other. U.S. and Canadian fed steer prices generally run closely together. In general, prices follow a cycle that is related to biological and market factors. Long-term cattle prices are determined in the U.S. market, but increasingly American producers compete with foreign imports of beef. For example, several large hamburger and restaurant chains in the United States import significant portions of their meat. At the same time, growth of foreign producers such as Australia and New Zealand has increased competition for American producers who wish to export. This adds downward pressure on prices received for American cattle. This trend is likely to continue for the near future as prices in California largely reflect these kinds of factors. They, too, are cyclical and have varied greatly in the last decade. As of January 1, 2011, over all of the U.S. all cattle and calf inventory was down 1 percent from the 2010 levels. This is the lowest inventory on hand since 1958.

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### 4.1.6 Forest Setting

#### ***Land base and Ownership***

The California Department of Forestry and Fire Protection's Fire and Resource Assessment Program (FRAP) defines California's forest lands as those lands that currently have at least 10 percent canopy cover of live trees as interpreted from satellite imagery. This definition includes not only conifer and hardwood forests but also considerable areas of woodlands. FRAP has made estimates of forest land based on the 10 percent cover rule. This estimate varies from published U.S. Forest Service (USFS), Pacific Northwest Experiment Station (PNW) forest land estimates. The USFS/PNW includes forest lands that were stocked in the past in their estimates. In contrast, FRAP estimations are based on current vegetation rather than potential vegetation. FRAP's Land Cover Mapping and Monitoring Program estimates include conifer and hardwood forests in the forest land base, but unlike USFS/PNW excludes chaparral, shrub lands, and other non-stocked lands capable of producing trees. Based on this definition, forestlands are depicted in Figure 4.1.2.

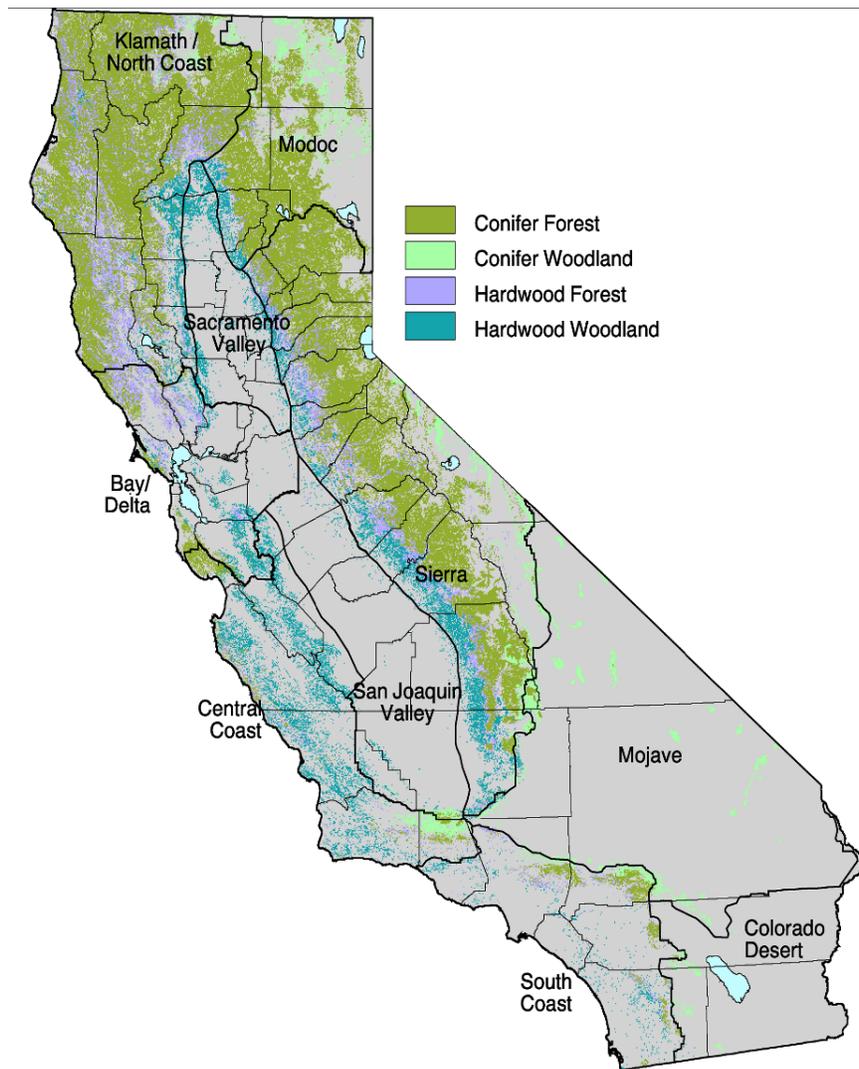


Figure 4.1.2 California forest lands by bioregion

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A primary source of information for the forest land base is timberland statistics, which are reported by the Pacific Resource Inventory, Monitoring and Evaluation Program (PRIME) of PNW. This reporting mechanism is often referred to as the Forest Inventory and Analysis (FIA). FIA statistics are collected and reported for several regions or resource areas. These include the North Coast, Central Coast, North Interior, Sacramento, and San Joaquin/Southern. (See web site for California FIA data <http://www.fs.fed.us/pnw/fia/>).

Under FIA, the forestland base is classified into several categories that describe capability and availability for timber production. FIA groups forest land into the following categories:

**Timberland:** Forest land capable of growing 20 cubic feet or more of industrial wood per acre per year (mean increment at culmination in fully stocked, natural stands). These lands correspond closely to lands that can be viably managed sustainable for timber production.

**Reserved and withdrawn timberland:** Forest land capable of growing 20 cubic feet or more of industrial wood per acre per year (mean annual increment at culmination in fully stocked, natural stands). Reserved timberland has been dedicated to non-commodity use through statute, ordinance, or administrative order (i.e. Parks and Wilderness Areas).

**Other forest:** Forest land incapable of growing 20 cubic feet of industrial wood per acre per year (mean annual increment at culmination in fully stocked, natural stands) due to adverse conditions. Such conditions include sterile soils, dry climate, poor drainage, subalpine sites, steepness, or rockiness.

**Reserved other forest:** Forest land not capable of growing 20 cubic feet of industrial wood per acre per year that is statutorily reserved from harvesting.

Most of California’s timberland is found in the North Coast, North Interior, and Sacramento resource areas. Most of the reserved forests and timberlands are found in the San Joaquin, North Interior, and North Coast resource areas (Table 4.1.4).

<b>Table 4.1.4</b>					
<b>Area of Forest Land by Classification and Resource Area (thousand acres), 2001-2009</b>					
<b>FIA Resource Area</b>	<b>Timberland</b>	<b>Reserved and Withdrawn Timberland</b>	<b>Other Forest</b>	<b>Reserved Other Forest</b>	<b>Total Forest</b>
All California	(59%) 19,375	(12%) 4,083	(24%) 7,728	(5%) 1,760	32,946
Central Coast	527	244	1,345	298	2,412
North Coast	3,958	344	308	26	4,635
North Interior	6,796	1,137	1,648	61	9,642
Sacramento	5,067	245	1,191	84	6,587
San Joaquin	2,712	2,006	2,469	754	7,941
Southern	316	108	768	537	1,729

Source: compiled by FRAP from Waddell, 2011

FIA provides a description of the classes of ownership *corporate and non-corporate private, USFS, Other Federal and State and Local Government* for VTP projects that are utilized by landowners in all five categories. USFS includes lands administered by that agency. *Other Federal*

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covers land administered by other federal agencies. In California, this would cover lands administered by federal entities such as the National Park Service, BLM, US Fish and Wildlife Service, and the Department of Defense. *State and Local Government* and lands are administered by state entities like the State Department of Parks and Recreation.

The classification of *Private Corporate* includes land owned by companies, Corporations, legal partnerships, investment firms, banks, timberland or real-estate investment trusts. The Private Corporate owns just under half of the privately owned timberland.

The classification of *Private Non-Corporate* includes lands not owned by corporate forest ownership. This includes non-governmental conservation and natural resources organizations, unincorporated local partnerships, associations and clubs, farmer and rancher owned lands, privately managed timberland without mills, Native American lands, and individually owned private lands. This ownership class controls close to the same amount timberland as the corporate ownership, but they generally have older stands. Additionally, other private owners hold roughly half of all acres of where the trees are of harvestable ages.

The class of “other owners” can include lands owned and/or managed by trusts or conservancies. This is significant in California because, according to the Land Trust Census in 2000, California ranked first in total acres that included 132 land trusts and protected 1.25 million acres. Within California, land trusts have protected both forest and rangeland through ownership, purchase of conservation easements, or land transfers to governmental agencies.

Distribution of timberland ownership differs considerably from one region to another (Table 4.1.5). National forests are the predominant timberland owners in the North Interior, Sacramento, and the combined San Joaquin/Southern resource areas. Forest industry has the largest holdings in the North Coast and substantial holdings in the North Interior. Other private owners are the predominant ownership category in the Central Coast.

Resource Area	Total Private	Forest Industry	Other Private	Total Public	USFS	Other Public	Total
North Coast	2,738	1,402	1,336	675	535	140	3,413
North Interior	2,276	1,717	559	3,669	3,519	150	5,945
Sacramento	1,663	911	752	2,635	2,556	79	4,298
San Joaquin/Southern	515	146	369	2,173	2,120	53	2,688
Central Coast	245	22	22	62	55	7	307
<b>California</b>	<b>7,437</b>	<b>4198</b>	<b>3,239</b>	<b>9,214</b>	<b>8,785</b>	<b>429</b>	<b>16,651</b>

Under the Forest Taxation Reform Act, 5.4 million acres of non-federal timberland in 32 counties have been designated as Timber Production Zones (TPZ). Similar to open space zoning for agricultural lands, these lands receive a lower property tax assessment in exchange for limiting their use to timber production and compatible uses. Regionally, lands with the highest proportion of timberlands in TPZ include the Klamath/North Coast and Modoc bioregions. Approximately three quarters of private timberland in California is TPZ land (Shih, 1998).

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### 4.1.7 Bioregion Overview

#### Introduction

The following Bioregion descriptions are modified from the California Biodiversity Council Website:

#### Klamath/North Coast

**Description:** Bounded on the west by the Pacific coastline and on the north by the Oregon border. The bioregion extends eastwards to include all of Klamath National Forest and Shasta-Trinity National Forest and the entire North Coast Range (down to the Sacramento Valley floor) The southern boundary reaches the southern limits of Lake and Mendocino counties (Figure 4.1.3).

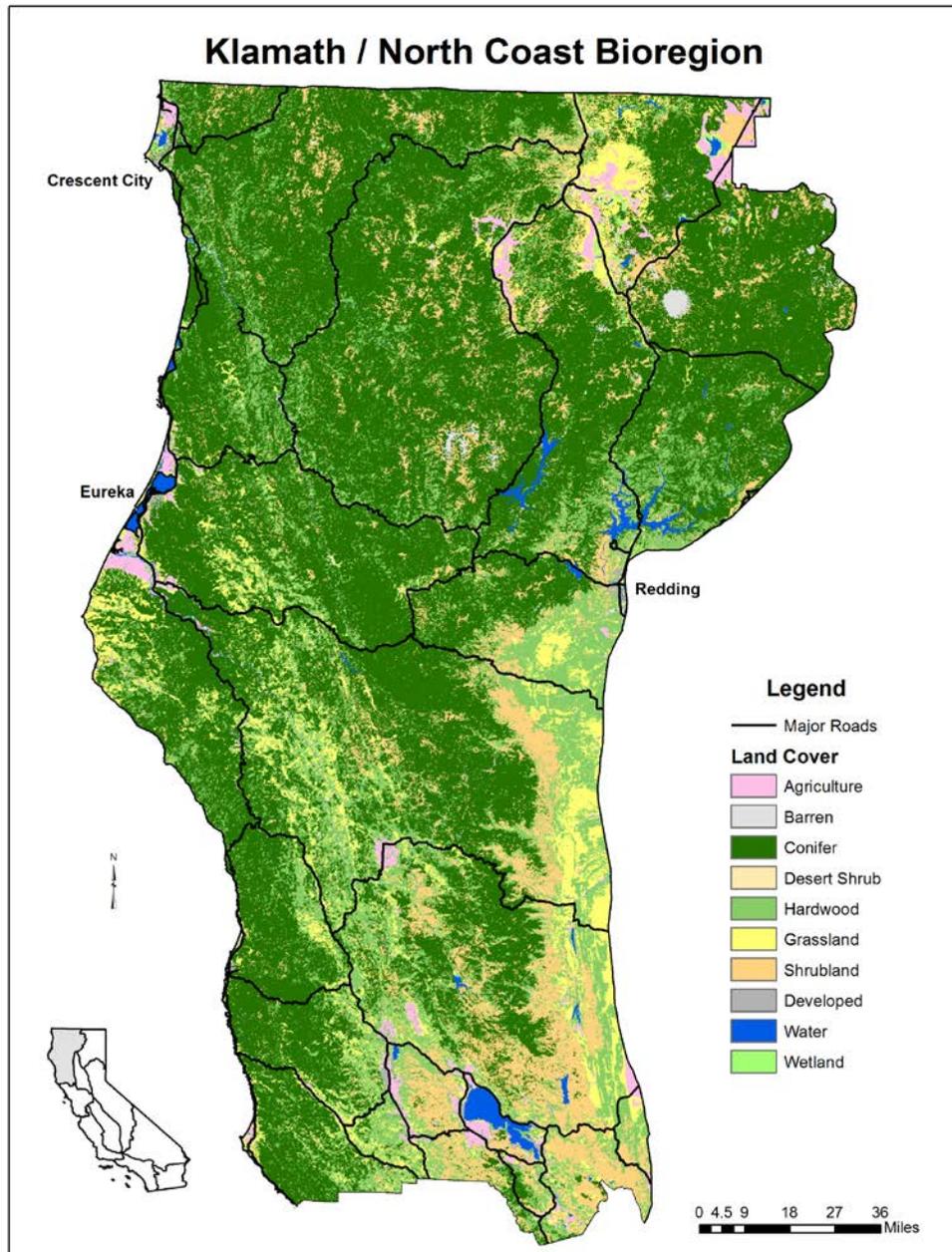


Figure 4.1.3 North Coast/Klamath Bioregion

## Modoc

**Description:** Bounded on north by the Oregon border and on the east by the Nevada border. The bioregion extends west to include all of Modoc National Forest and Lassen National Forest, plus additional lands extending down to the Sacramento Valley floor. The southern boundary reaches the southern limits of Lassen National Forest and Lassen County (Figure 4.1.4).

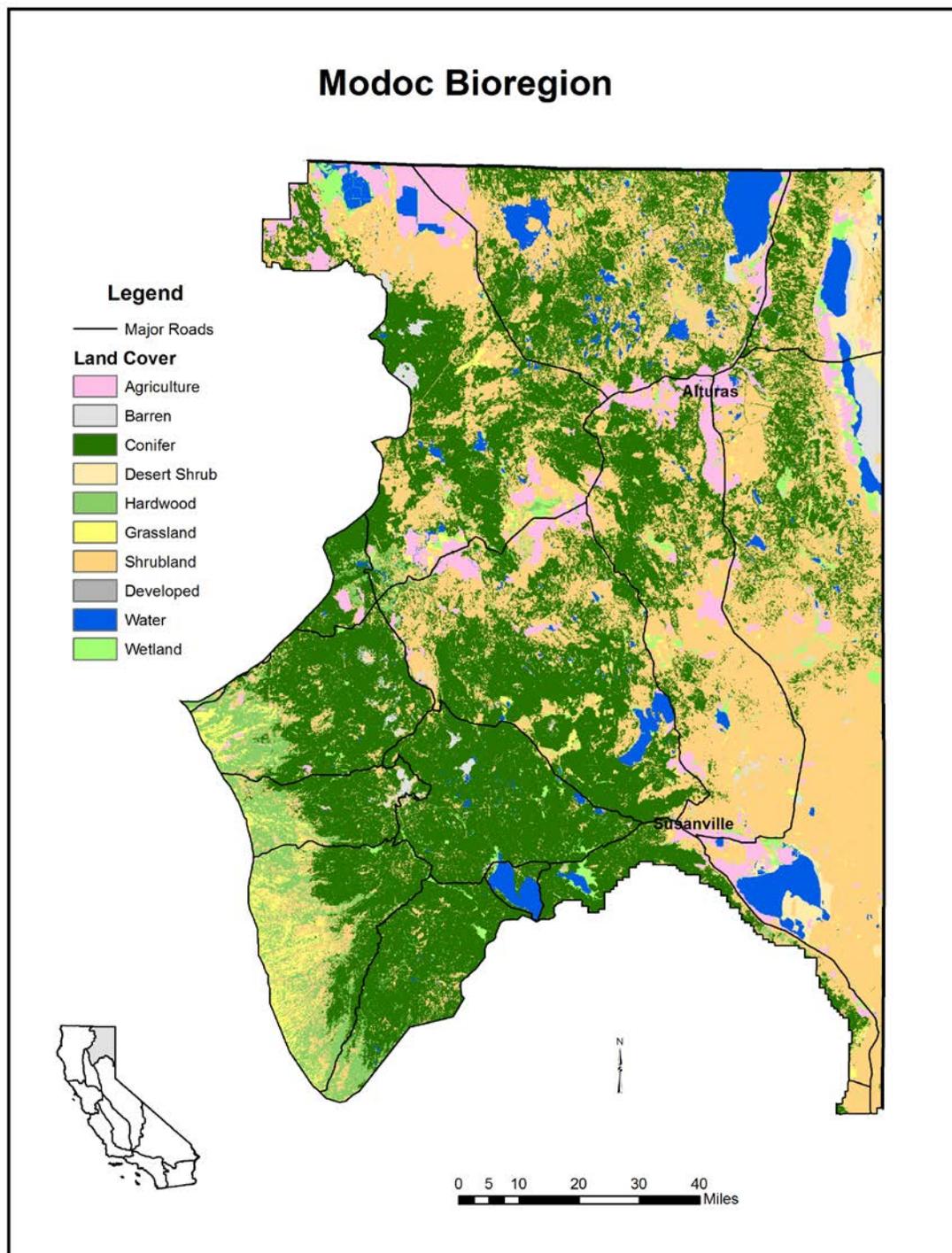


Figure 4.1.4 Modoc Bioregion

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### Sacramento Valley

**Description:** The western, northern and eastern limits are the edges of the valley floor (essentially where the blue oak woodland starts). The southern limit is the northern edge of the Sacramento-San Joaquin Delta (Figure 4.1.5).

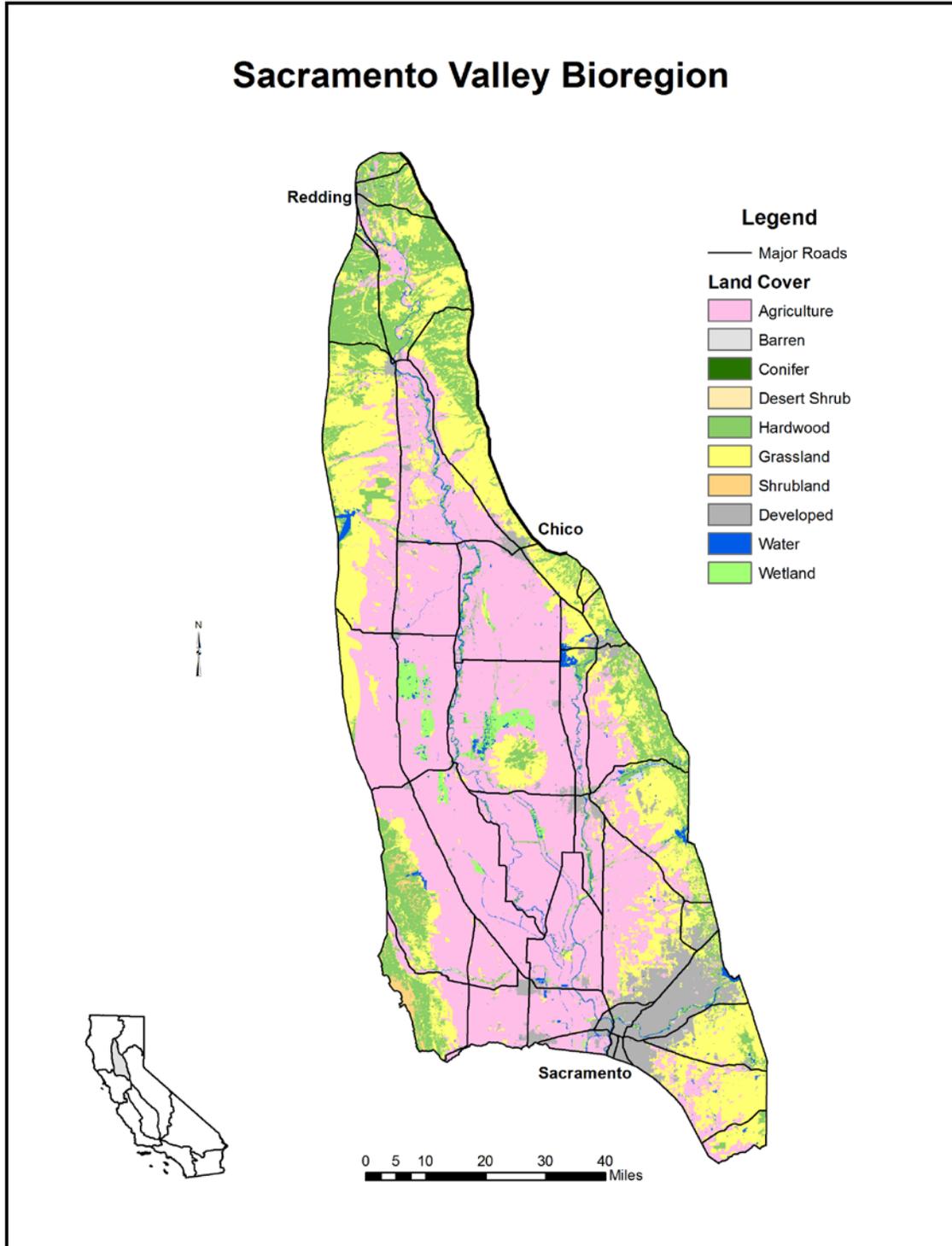


Figure 4.1.5 Sacramento Valley Bioregion

## Regional Setting and Bioregion Overview

### Bay/Delta

**Description:** The boundary is essentially the immediate watershed of the Bay Area and the Delta, not including the major rivers that flow into the Delta. Bounded on the north by northern edge of Sonoma and Napa counties and the Delta and extending east to the edge of the Sacramento valley floor. The bioregion is bounded on the south by the southern edge of San Joaquin County, the eastern edge of the Diablo Range, the southern edge of Santa Clara and San Mateo counties (Figure 4.1.6).

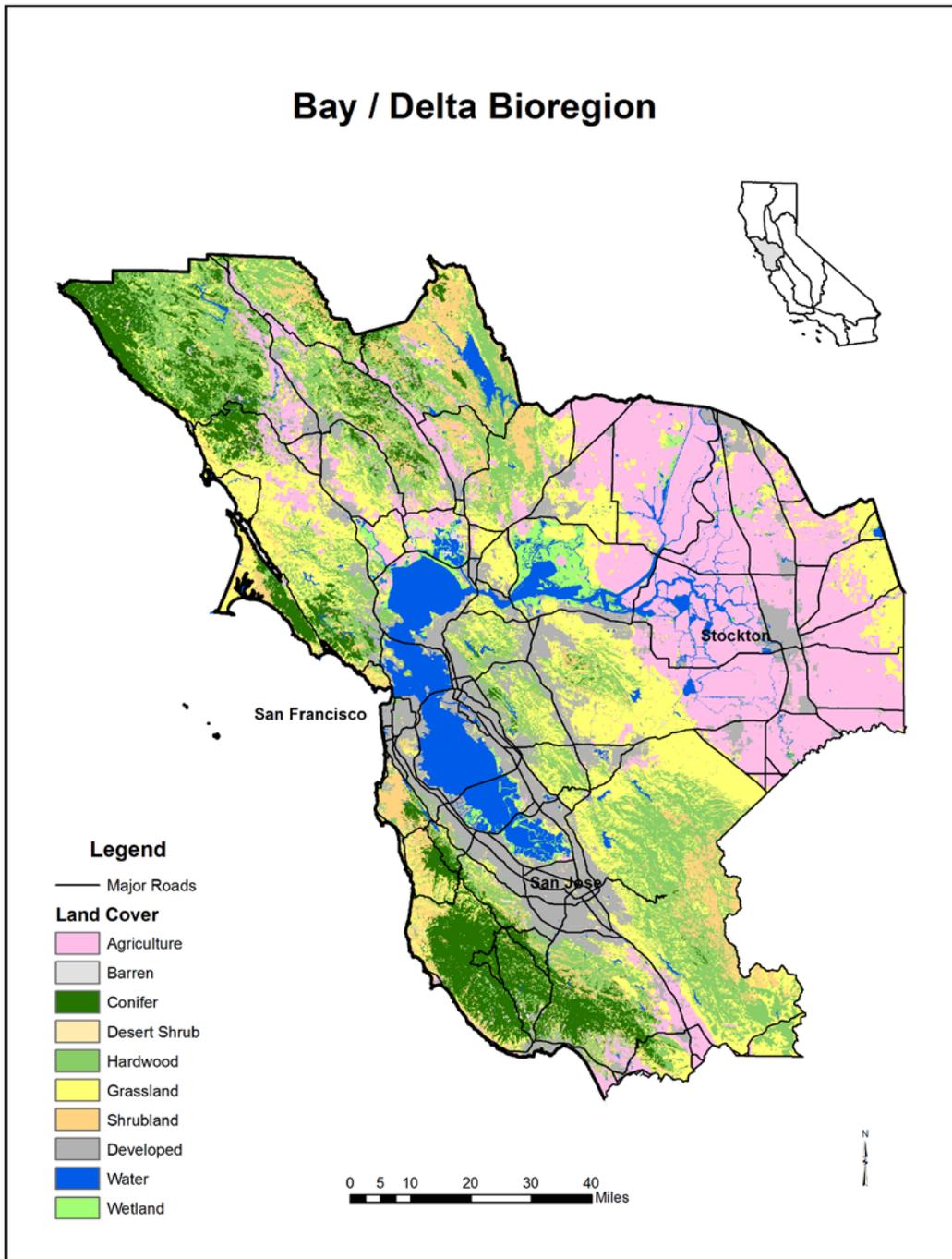


Figure 4.1.6 Bay Delta Bioregion

## Regional Setting and Bioregion Overview

### Sierra

**Description:** Bounded on the north by the northern edge of Plumas National Forest. The western edge is the Sacramento Valley floor. Bounded on the east by the Nevada state line and the western edge of BLM's California Desert Conservation Area and bounded on the west by the Sacramento and San Joaquin Valley floors, and south to the Tejon Pass in the Tehachapi Mountains (Figure 4.1.7).

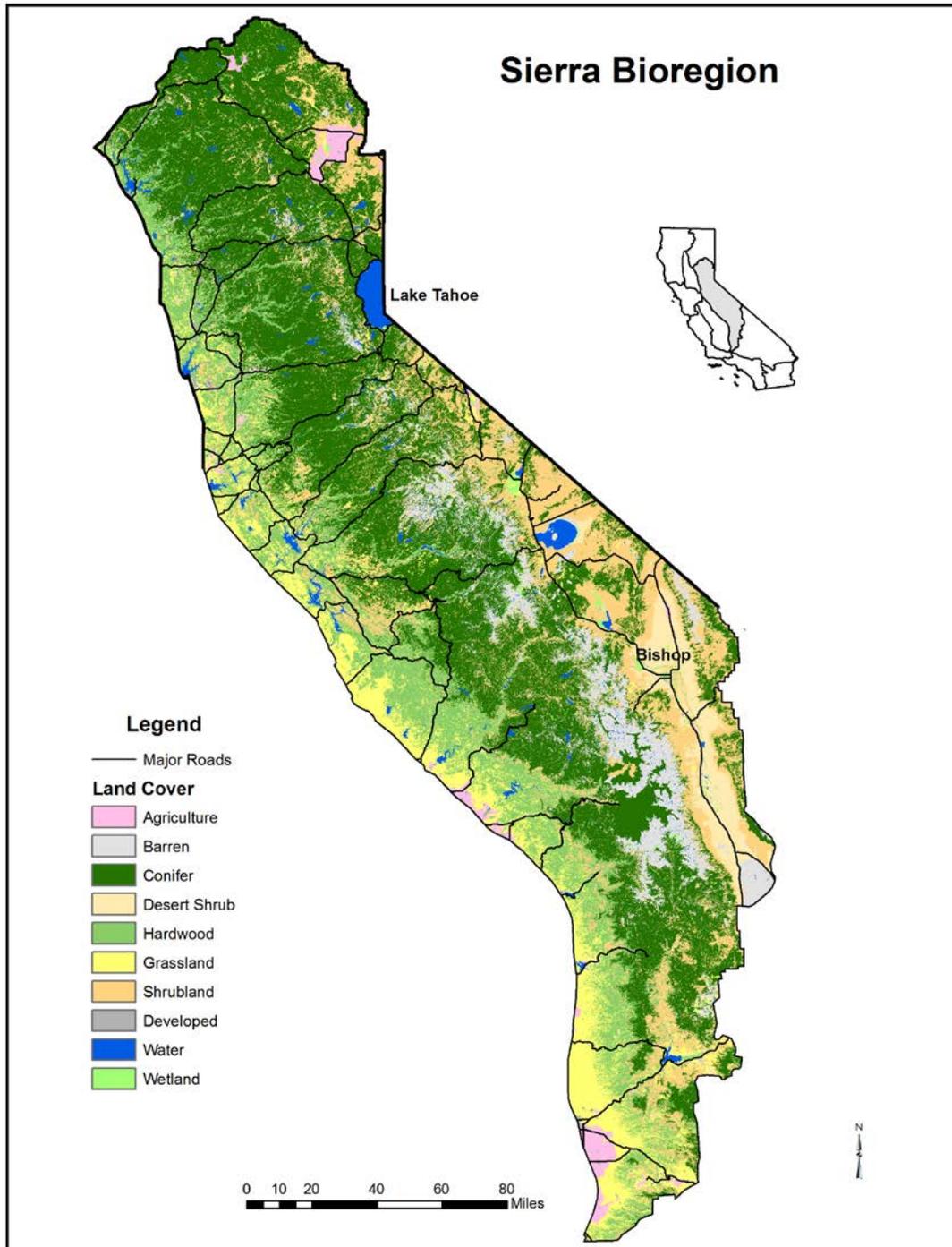


Figure 4.1.7 Sierra Bioregion

## Regional Setting and Bioregion Overview

### San Joaquin Valley

**Description:** Bounded on north by the southern edge of the Delta, and on all other sides (west, south, and east) by the San Joaquin Valley floor. The one major exception to this is the southwestern extension to include the Carrizo Plain and BLM-managed lands in the Caliente Resource Area (eastern San Luis Obispo County) (Figure 4.1.8).

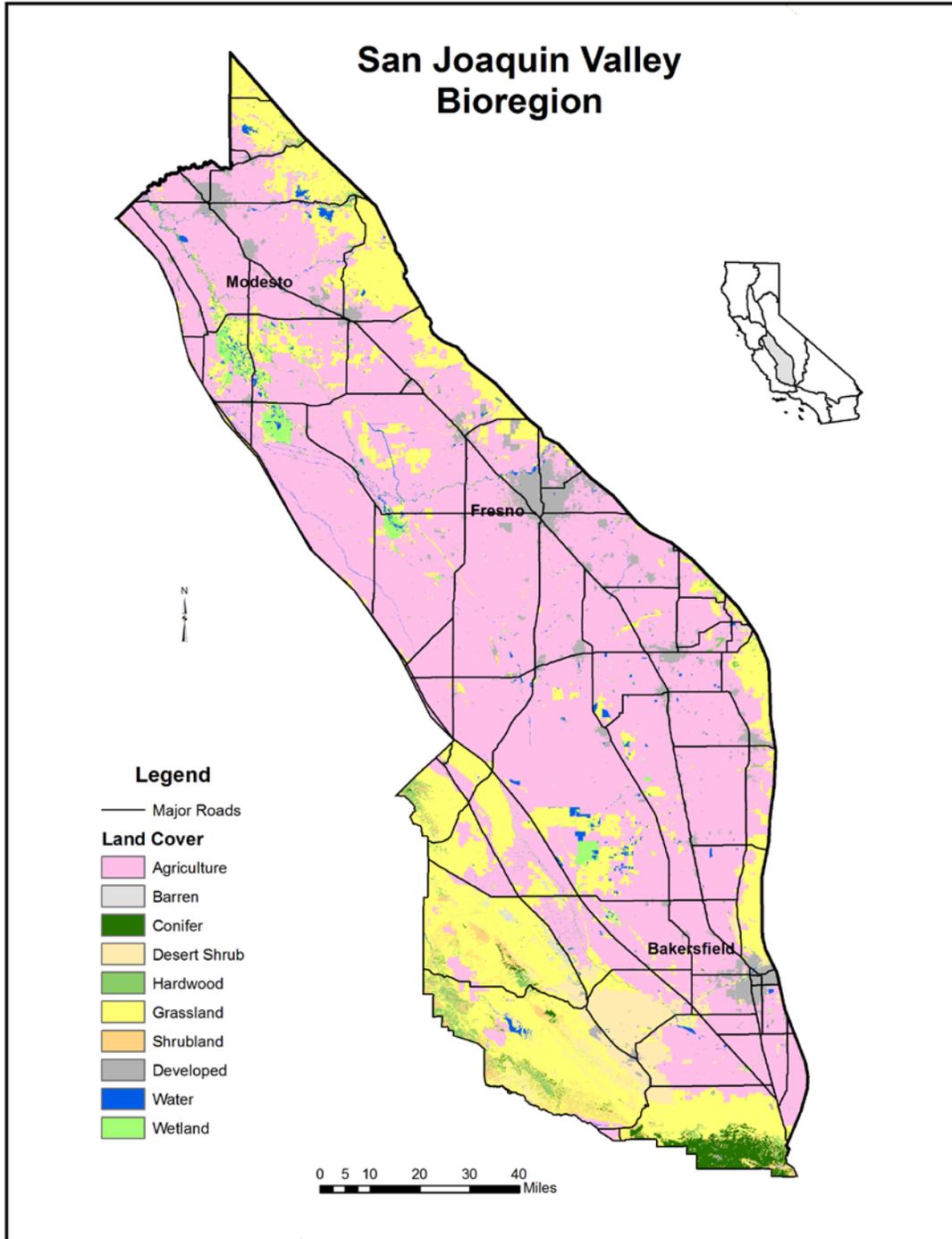


Figure 4.1.8 San Joaquin Valley Bioregion

## Regional Setting and Bioregion Overview

### Central Coast

**Description:** Bounded on north by the northern limits of Santa Cruz and San Benito counties, and on the east by the San Joaquin Valley floor and the Carrizo Plain. The southeastern limit is the eastern and southern edges of the Los Padres National Forest. The western edge is the coastline (Figure 4.1.9).

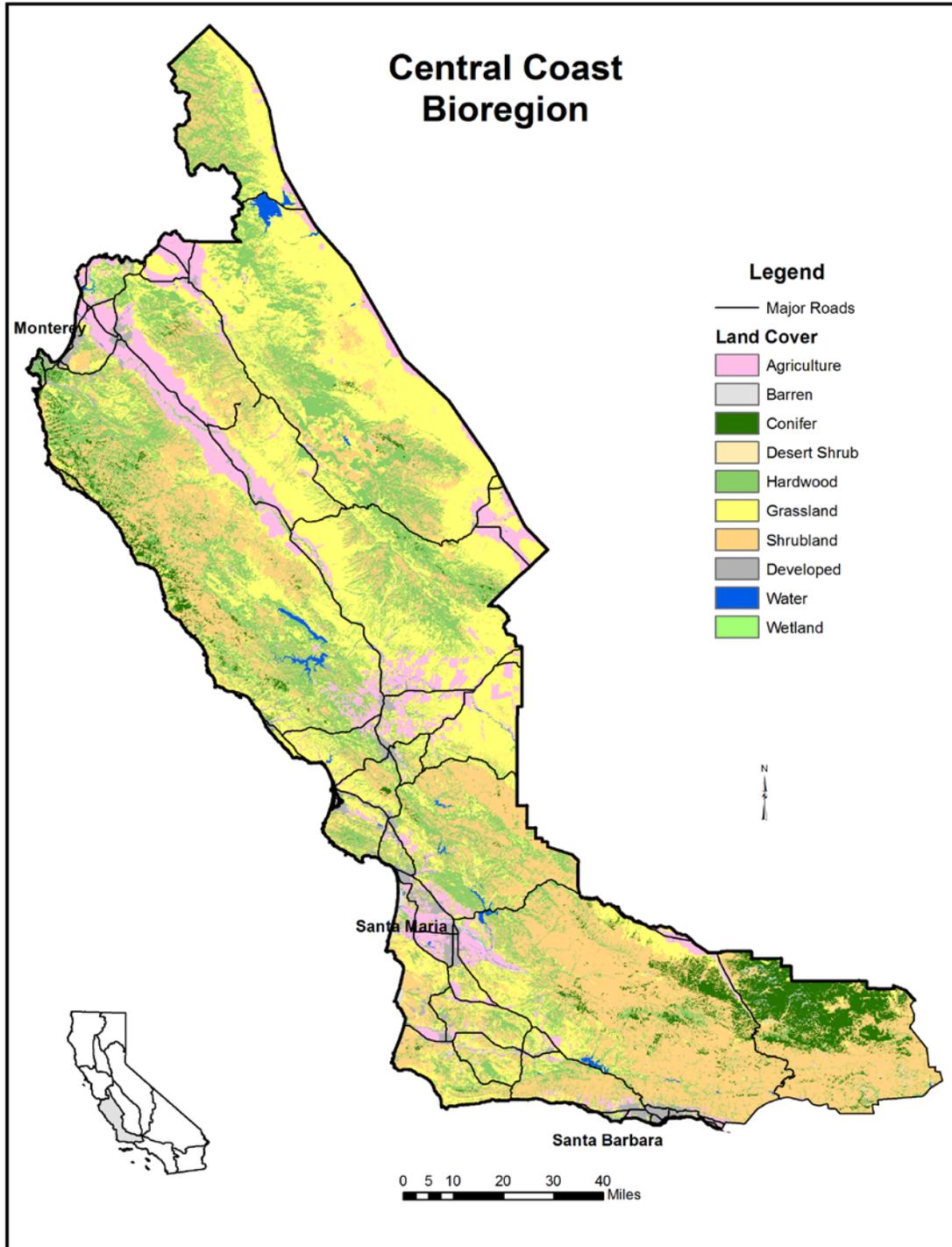


Figure 4.1.9 Central Coast Bioregion

## Regional Setting and Bioregion Overview

### Mojave

**Description:** Bounded on west by western edge of BLM California Desert Conservation Area and on east by Nevada state line. Bounded on south by the northern base of the San Gabriel and San Bernardino Mountains, the southern edge of Joshua Tree National Monument, and the southern edge of San Bernardino County (between Joshua Tree and Nevada state line) (Figure 4.1.10).

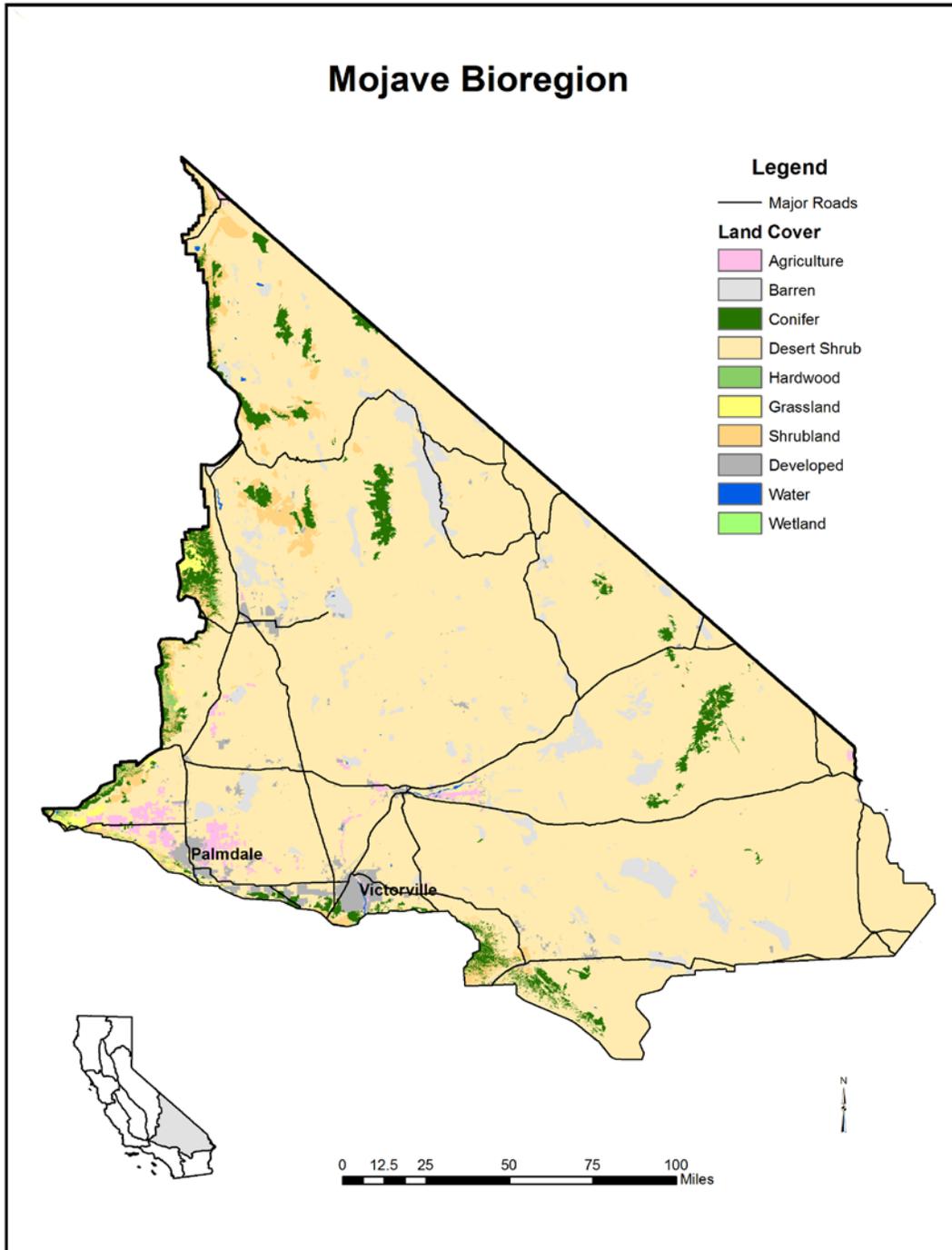


Figure 4.1.10 Mojave Bioregion

## Regional Setting and Bioregion Overview

### South Coast

**Description:** Bounded on the north by the southern edge of Los Padres National Forest and the northern base of the San Gabriel and San Bernardino Mountains and bounded on the east by the western edge of the BLM California Desert Conservation Area and on south by Mexican border (Figure 4.1.11).

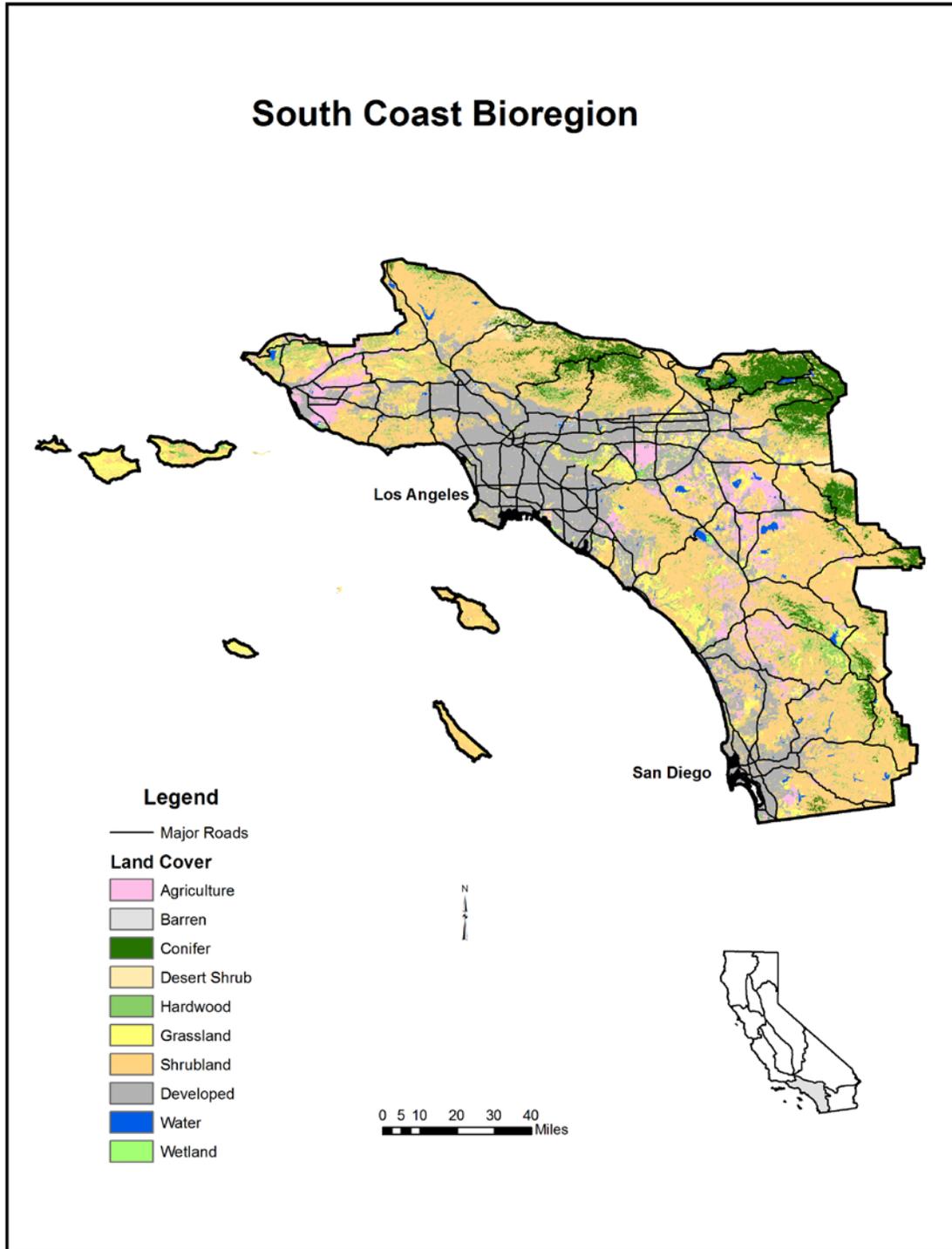


Figure 4.1.11 South Coast Bioregion

## Regional Setting and Bioregion Overview

### Colorado Desert

**Description:** Bounded on the west by the western edge of the BLM Desert Conservation Area and on the north by the southern edge of Joshua Tree National Monument and the southern edge of San Bernardino County and the east by Arizona state line and on south by Mexican border (Figure 4.1.12).

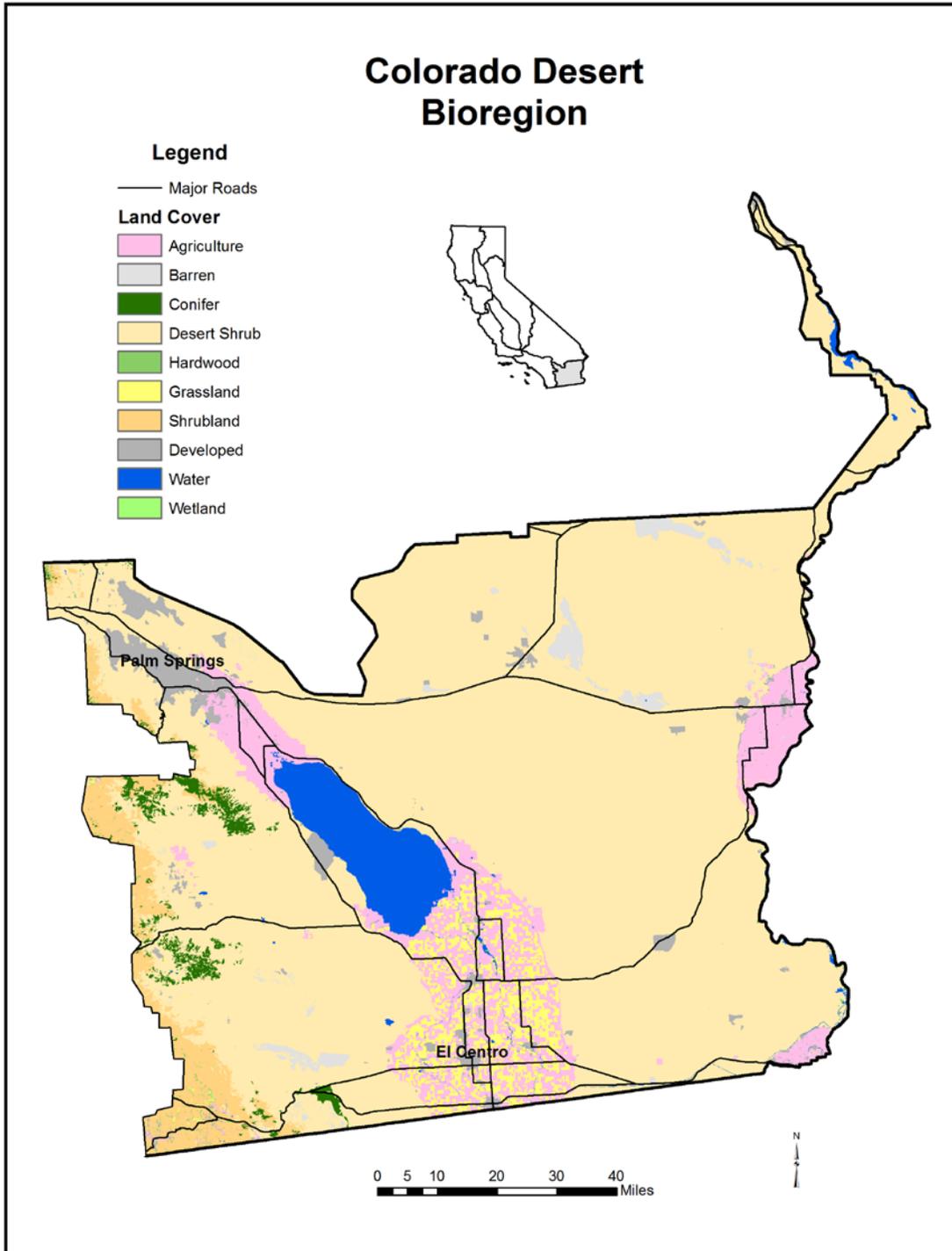


Figure 4.1.12 Colorado Desert Bioregion