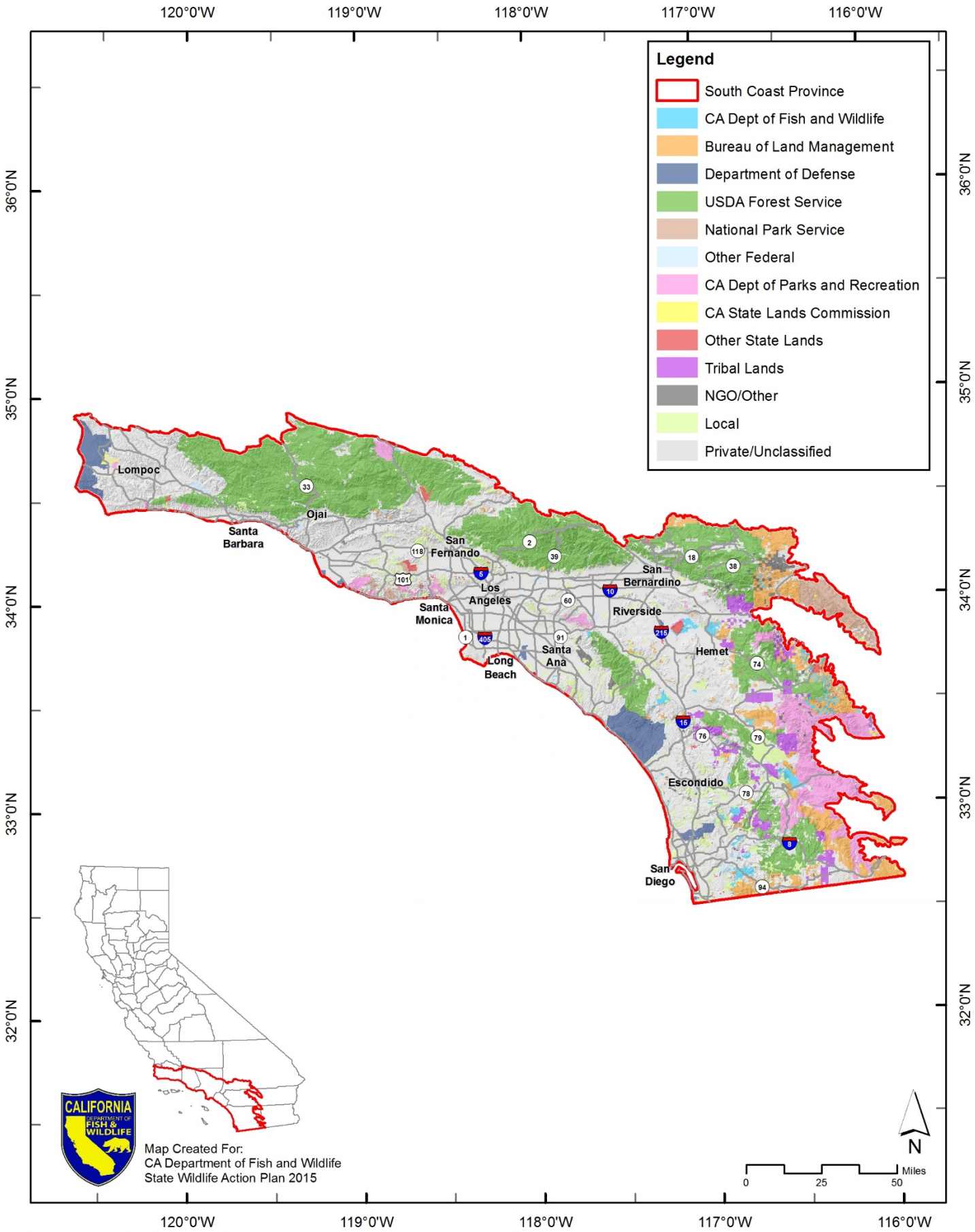
5.5 South Coast Province

5.5.1 Geophysical and Ecological Description of the Province

California's South Coast Province encompasses more than eight million acres, extending along the coast from the Santa Barbara County in the north to the Mexico border in the south (Figure 5.5-1). Inland, the region is bounded by the Peninsular Mountain Ranges and the transition to the Mojave and Colorado Deserts on the east and by the Transverse Mountain Ranges on the north. It is an area of strikingly varied landscapes, ranging from wetlands and beaches to hillsides, rugged mountains, arid deserts, and densely populated metropolitan areas.

Robb Hannawacker, NPS

The region's coastal habitats include coastal strand, lagoons, and river-mouth estuaries that transition from riparian wetlands to fresh and saltwater marshes. California least tern, western snowy plover, light-footed Ridgway's rail, California brown pelican, and other waterfowl and shorebirds depend on these habitats. Moving inland, the predominant hillside and bluff communities are coastal sage scrub and chaparral. Southern California's coastal sage scrub is composed of a mix of drought-resistant shrubs and forbs found no place else in the country, commonly including California sagebrush, bush monkeyflower, buckwheat species, and black, purple, or white sage. Chaparral plant communities (also drought tolerant) are characterized by a greater component of woody species, including chamise, manzanita, California lilac, and scrub oak. Inhabitants of sage scrub and chaparral communities include the coast horned lizard, rosy boa, California gnatcatcher, San Diego cactus wren, Pacific pocket mouse, and Quino checkerspot butterfly. Isolated grasslands and vernal pool habitats are interspersed in the coastal landscape and support unique and endemic species such as Stephens' kangaroo rat and fairy shrimp species. Low- to mid-elevation uplands often feature oak woodlands, including Engelmann oak. Higher-elevation mountainous areas are dominated by coniferous forests, including Jeffrey pine, Ponderosa pine, big-cone Douglas fir, and white fir, and support sensitive species such as long-eared and long-legged myotis bats. Along the Peninsular Mountain Range, coniferous forests transition to the western edge of the Colorado and Mojave Desert ecosystems.



Data Source: California Protected Areas Database; US Geological Survey (hillshade); CDFW Lands

Figure 5.5-1 Land Ownership of the South Coast Province

The province's largest river drainages include the Tijuana, San Diego, San Luis Rey, Santa Margarita, Santa Ana, San Gabriel, Los Angeles, Santa Clara, Santa Ynez, and Ventura rivers. Coniferous forests occur along high-elevation stream reaches, and some mountain drainages host mountain yellow-legged frog, California red-legged frog, Santa Ana sucker, and Santa Ana speckled dace. Lower-elevation river reaches support riparian vegetation species, including cottonwood, willow, sycamore, and coast live oak, which provide habitat for such riparian bird species as the least Bell's vireo, southwestern willow flycatcher, Swainson's thrush, yellow-billed cuckoo, and yellow warbler, as well as the arroyo chub and arroyo toad. In urbanized coastal areas, many sections of the province's river corridors are channelized with concrete and support mostly non-native species.

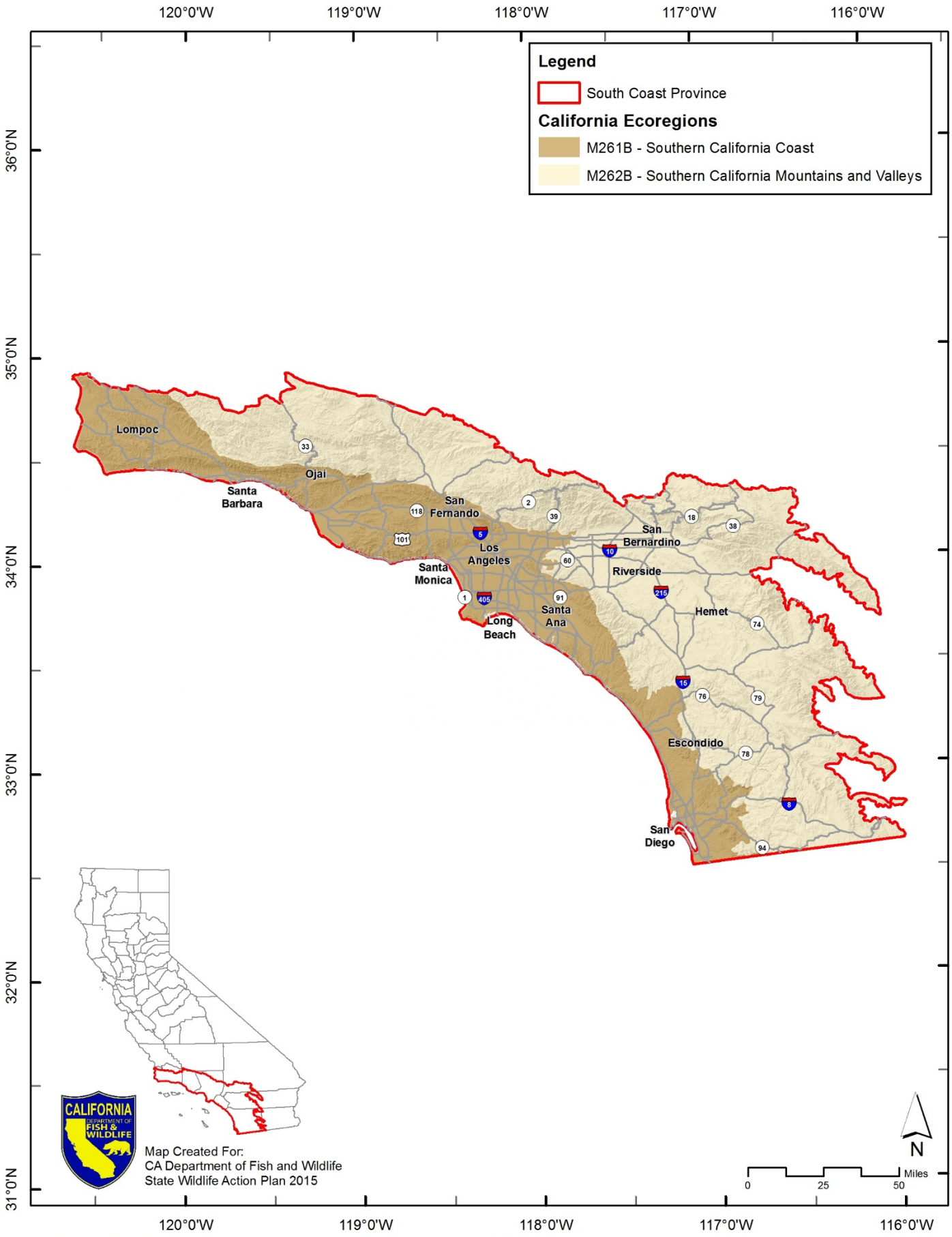
The province is recognized as one of the world's hotspots of biological diversity and is home to more than 470 vertebrate animal species, approximately 38 percent of all the vertebrate species found in California. It is also distinguished by the tremendous population growth and urbanization that have transformed the landscape since the 1940s. This intersection of biological resources and urbanization has made the South Coast Province the most-threatened biologically diverse area in the continental U.S. (U.S. Geological Survey [USGS] 2003). More than 150 species of vertebrate animals and 200 species of plants are either listed as protected or considered sensitive by wildlife agencies and conservation groups (Hunter 1999).

Despite the province's rapid growth and subsequent loss of habitat, Southern California retains some large and valuable natural lands, including the national forests, which form an interconnected system of wildlands flanking the coast's metropolitan areas. Wide-ranging species, including the mountain lion, coyote, and golden eagle, can still be found in these large habitats.

On the outskirts of Los Angeles, hiking trails traversing canyons in the Santa Monica Mountains pass through the range of the mountain lion and golden eagle. Only from the mountaintops, where the view reveals the Los Angeles metropolis spreading to the ocean, is it clear that these natural lands exist within one of the world's most urbanized regions. This juxtaposition of urban landscapes with remaining significant natural areas is one of the defining characteristics of the South Coast. The ongoing pressures of growth and urbanization require substantial and timely efforts to preserve the province's remaining wildlife diversity.

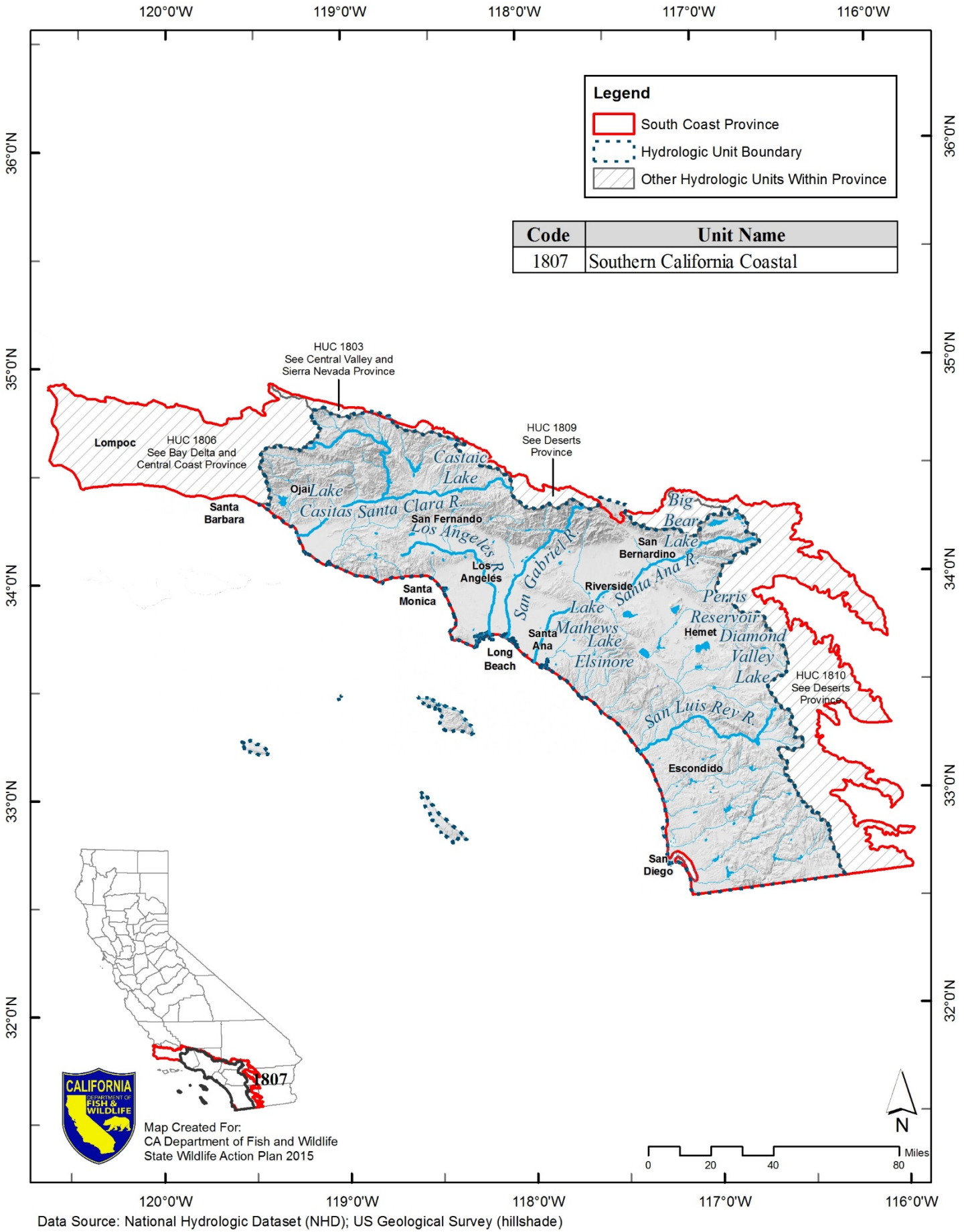
5.5.2 Conservation Units and Targets

The conservation units associated with the South Coast Province are the Southern California Coast and Southern California Mountain and Valley ecoregions (Figure 5.5-2), and the Southern California Coastal hydrologic unit (Figure 5.5-3). Figure 5.5-4 shows the distribution of the plant communities within the province. The selected targets for each of these conservation units are summarized in Table 5.5-1.



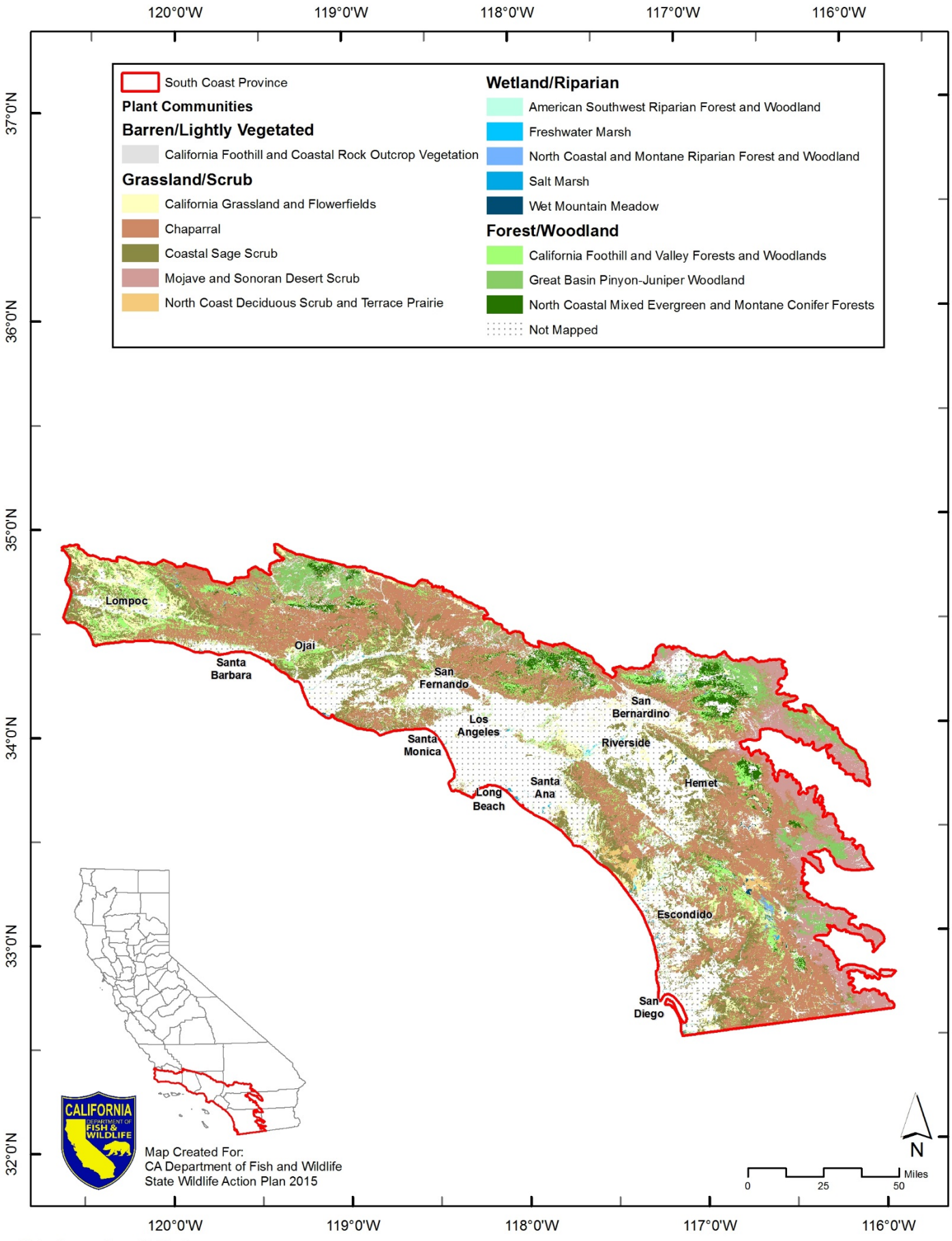
Data Source: USDA Forest Service (ecoregions); US Geological Survey (hillshade)

Figure 5.5-2 Ecoregions of the South Coast Province



Data Source: National Hydrologic Dataset (NHD); US Geological Survey (hillshade)

Figure 5.5-3 Hydrologic Units of the South Coast Province



Data Source:fveg (Calfire)

Figure 5.5-4 Plant Communities of the South Coast Province

Table 5.5-1 Summary of Conservation Units and Targets – South Coast Province*

Conservation Unit	Geographic and Ecological Summary	Conservation Target	Target Summary	Focal CWHR Types Associated with Target
Southern California Coast Ecoregion	This unit contains mountains, hills, valleys, and plains of the Transverse Ranges and of the Peninsular Ranges that are close enough to the Pacific Ocean for the climate to be modified greatly by marine influence. Elevation range: 0 to 3,000	California Grassland and Flowerfields	Includes all annual forb/grass vegetation native and non-native, as well as native perennial grasslands growing within the California Mediterranean climate. This does not include the cool-moist north coastal terrace prairies, the montane meadow/upland grasslands, and non-native perennial pasture grasses. Native perennial grasslands include needle grass species (*Stipa*, *Achnatherum*, *Nassella*), melicgrass and giant wild rye. Annual native forb and wildflower fields including species of poppy, goldfields, popcorn flowers, *Phacelia*, fiddleneck, and others. Non-native annual grasslands composed of Eurasian species such as wild oat, brome, annual fescue, starthistle, mustards, fennel, and others are also included in this target.	Annual grassland, Perennial grassland
Southern California Mountain and Valley Ecoregion	This unit includes mountains, hills and valleys of the Transverse Ranges and the Peninsular Ranges that are near the Pacific Ocean, but not bordering it. Much of the section is close enough to the Pacific Ocean for the climate to be modified moderately marine influence. Elevation range: 300 to 11,500	American Southwest Riparian Forest and Woodland	Riparian forests and thickets are included in this target. The range of the main indicator trees and shrubs are the SW US and N Mexico. Most stands of this target occur below 4,000 feet elevation and are replaced by the cool-temperate version of riparian (Montane and North Coast Riparian Forest and Scrub) in the mountains. Diagnostic species include Fremont cottonwood, Black and red willow, California sycamore, California wild grape, arroyo willow, narrow-leaf willow, button-bush, spice bush and California fan palm (native stands in the warm desert). Most stands are found in permanently moist settings or riparian settings where sub-surface water is available year-round.	Valley foothill riparian, Palm oasis
Southern California Coastal HUC 1807	Includes the drainage that discharges into the Pacific Ocean from the Rincon Creek Basin boundary south to the California-Baja California border. Covers an area of 11,100 square miles. Elevation range: 0 to 9,700	Native Fish Assemblage	SGCN associated with target are unarmored three spine stickleback, tidewater goby, Santa Ana sucker, Santa Ana speckled dace, and arroyo chub.	N/A
		South Coast Native Aquatic Herp Assemblage	SGCN associated with target are California red-legged frog, California tiger salamander, mountain yellow-legged frog, arroyo toad, western pond turtle, coast range newt, and two-striped garter snake.	N/A

* Description referenced from CDFG 1988, USDA 1994, USDA 2007 and Keeler-Wolf 2010.

5.5.3 Key Ecological Attributes

Key ecological attributes (KEAs) were identified for each conservation target. These attributes are considered the most important for the viability of the targets and their associated species. The KEAs for the South Coast Province are listed in Table 5.5-2. The most commonly identified attributes for the South Coast Province are:

- area and extent of community,
- connectivity among communities and ecosystems,
- native versus non-native diversity, and
- surface water flow regime.

Table 5.5-2 Key Ecological Attributes – South Coast Province

Key Ecological Attribute	Conservation Unit and Target			
	Southern California Coast	Southern California Mountain and Valley	Southern California Coastal HUC 1807	
	California Grassland and Flowerfields	American Southwest Riparian Forest and Woodland	Native Fish Assemblage	South Coast Native Aquatic Herp Assemblage
Area and extent of community	X	X		X
Fire regime	X			
Connectivity among communities and ecosystems	X	X	X	
Successional dynamics	X			
Community structure and composition				
Key species population levels	X	X		
Structural diversity		X		
Endemic diversity	X			
Native versus non-native diversity	X	X	X	X
Age class heterogeneity			X	X
Diversity			X	
Hydrological regime		X		
Soil and sediment deposition regime	X			
Surface water flow regime		X	X	X
Water level fluctuations		X	X	
Nutrient concentrations and dynamics	X			

5.5.4 Species of Greatest Conservation Need in the South Coast Province

The SWAP regional team identified species that would benefit from the conservation strategies for each target within the province. These species are the focus of the conservation strategies and will benefit from the actions taken to implement the conservation strategies. Not all of the focal species meet the criteria to be considered Species of Greatest Conservation Need (SGCN). The criteria used to determine SGCN are described in Section 2.4 and the complete list of SGCN for California is presented in Appendix C. Table 5.5-3 lists the focal species for each conservation unit and target within the South Coast Province. SGCN are indicated with an asterisk.

Table 5.5-3 Focal Species of Conservation Strategies Developed for Conservation Targets – South Coast Province

Common Name	Scientific Name	Conservation Unit and Target[1]			
		Southern California Coast	Southern California Mountain and Valley	Southern California Coastal HUC 1807	
		California Grassland and Flowerfields	American Southwest Riparian Forest and Woodland	Native Fish Assemblage	South Coast Native Aquatic Herp Assemblage
Invertebrates					
Quino checkerspot butterfly*	*Euphydryas editha quino*	X			
Fishes					
Arroyo chub*	*Gila orcuttii*			X	
Santa Ana speckled dace*	*Rhinichthys osculus* ssp.			X	
Santa Ana sucker*	*Catostomus santaanae*			X	
Unarmored threespine stickleback*	*Gasterosteus aculeatus williamsoni*			X	
Tidewater goby*	*Eucyclogobius newberryi*			X	
Amphibians					
California Tiger salamander*	*Ambystoma californiense*	X	X		X
California newt* (Monterey County and South)	*Taricha torosa*		X		X
Western spadefoot*	*Spea hammondii*	X	X		
Arroyo toad*	*Anaxyrus californicus*	X	X		X
California red-legged frog*	*Rana draytonii*	X	X		X
Southern mountain yellow-legged frog*	*Rana muscosa*		X		X
Reptiles					
Western pond turtle*	*Emys marmorata*	X	X		X
Two-striped gartersnake*	*Thamnophis hammondii*		X		X
Birds					
White-faced ibis	*Plegadis chihi*	X	X		
California condor*	*Gymnogyps californianus*	X			
Osprey	*Pandion haliaetus*		X		
Golden eagle*	*Aquila chrysaetos*	X			
Ferruginous hawk	*Buteo regalis*	X			
Swainson's hawk*	*Buteo swainsoni*		X		
Northern harrier*	*Circus cyaneus*	X	X		
White-tailed kite*	*Elanus leucurus*	X	X		
Long-billed curlew	*Numenius americanus*	X			
Yellow-billed cuckoo*	*Coccyzus americanus*		X		
Greater roadrunner*	*Geococcyx californianus*	X			
Short-eared owl*	*Asio flammeus*	X			
Long-eared owl*	*Asio otus*	X	X		

Table 5.5-3 Focal Species of Conservation Strategies Developed for Conservation Targets – South Coast Province

Common Name	Scientific Name	Conservation Unit and Target[1]			
		Southern California Coast	Southern California Mountain and Valley	Southern California Coastal HUC 1807	
		California Grassland and Flowerfields	American Southwest Riparian Forest and Woodland	Native Fish Assemblage	South Coast Native Aquatic Herp Assemblage
Burrowing owl*	*Athene cunicularia*	X			
Belted kingfisher	*Megaceryle alcyon*		X		
Southwestern willow flycatcher*	*Empidonax traillii extimus*		X		
Vermilion flycatcher*	*Pyrocephalus rubinus*		X		
Loggerhead shrike*	*Lanius ludovicianus*	X			
Least Bell's vireo*	*Vireo bellii pusillus*		X		
Cactus wren*	*Campylorhynchus brunneicapillus*	X			
Yellow-breasted chat*	*Icteria virens*		X		
Summer tanager*	*Piranga rubra*		X		
Tricolored blackbird*	*Agelaius tricolor*	X	X		
Yellow-headed blackbird*	*Xanthocephalus xanthocephalus*		X		
Mammals					
California leaf-nosed bat*	*Macrotus californicus*		X		
Pallid bat*	*Antrozous pallidus*	X			
Western red bat*	*Lasiurus bossevillii*		X		
Hoary bat	*Lasiurus cinereus*		X		
Long-eared bat*	*Myotis evotis*		X		
Yuma myotis	*Myotis yumanensis*		X		
Western mastiff bat*	*Eumops perotis californicus*	X			
Pocketed free-tailed bat*	*Nyctinomops femorosaccus*		X		
Big free-tailed bat*	*Nyctinomops macrotis*		X		
San Diego black-tailed jackrabbit*	*Lepus californicus bennettii*	X			
Pallid San Diego pocket mouse*	*Chaetodipus fallax pallidus*	X	X		
Jacumba pocket mouse*	*Perognathus longimembris internationalis*		X		
Southern grasshopper mouse*	*Onychomys torridus ramona*	X	X		
Ringtail	*Bassariscus astutus*		X		
American badger*	*Taxidea taxus*	X			
Western spotted skunk	*Spilogale gracilis*		X		

[1] A species is shown for a particular conservation unit only if it is associated with specific conservation targets identified for the unit.
* Denotes a species on the SGCN list. Non-asterisked species are not SGCN but are identified as important species by CDFW staff.

5.5.5 Pressures on Conservation Targets

If the KEAs are degraded, then the target is experiencing some type of stress. Stresses are caused by pressures, anthropogenic (human-induced) or natural drivers that could result in impacts to the target by changing the ecological conditions. Pressures can be positive or negative depending on intensity, timing, and duration. The priority pressures identified as affecting the viability of conservation targets in the South Coast Province are summarized in Table 5.5-4. The most commonly addressed pressures identified for the province (i.e., those that affect several targets) are discussed below. The relationship between the stresses and pressures are unique for each conservation target and are identified in Section 5.5.6.

Table 5.5-4 Key Pressures on Conservation Targets – South Coast Province

Conservation Unit	Southern California Coast	Southern California Mountain and Valley	Southern California Coastal HUC 1807	
Target	**California Grassland and Flowerfields**	**American Southwest Riparian Forest and Woodland**	**Native Fish Assemblage**	**South Coast Native Aquatic Herp Assemblage**
Annual and perennial non-timber crops	X		X	X
Avalanches and landslides		X		
Climate change	X		X	X
Dams and water management/use		X	X	X
Fire and fire suppression	X	X		
Garbage and solid waste		X		
Household sewage and urban waste water		X	X	
Housing and urban areas	X	X	X	X
Invasive plants/animals	X	X	X	X
Livestock, farming, and ranching	X	X	X	
Mining and quarrying		X	X	X
Other ecosystem modifications				X
Parasites/pathogens/diseases				X
Recreational activities	X	X	X	X
Roads and railroads	X	X		X
Tourism and recreation areas		X	X	

Most Commonly Addressed Pressures for the South Coast Province

- **Housing and Urban Areas**
- **Invasive Plants/Animals**
- **Recreational Activities**
- **Annual and Perennial Non-Timber Crops**
- **Climate Change**

Housing and Urban Areas

Intensive population and development pressures in the South Coast have resulted in the greatest number of threatened and endangered species in California. By far, the most significant pressure on the South Coast's wildlife is urban, suburban, and rural development and resulting habitat loss and fragmentation. With approximately 24 million residents, the area is the state's most populous region. The two largest cities on the west coast, Los Angeles and San Diego are located in southern California (CCC 2010). Despite comprising only eight percent of the land area of California, the South Coast contains 56 percent of the total population (Keeley 2010).

Following World War II, Southern California experienced an economic and population boom spurred by military and industrial growth. The region's development patterns followed agricultural land uses and the availability of easily developed land. Across inland valleys that had supported citrus orchards and grazing, small agricultural towns grew to meet the needs of growing industry. Along the coast, development spread across the relatively flat coastal plains and mesas. Over the last few years, the region has continued to grow. Between 2010 and 2014, Los Angeles County grew from 9.82 million residents to 10.04 million, San Diego County from 3.09 to 3.19 million, and Orange County from 3.01 to 3.11 million (California Department of Finance 2014).

Dave Feliz, CDFW

Large portions of the province's natural areas have been converted to other uses; currently, nearly 40 percent the South Coast's land area is in urban and suburban use (California Department of Forestry and Fire Protection [CAL FIRE], Fire and Resource Assessment Program 2010). Beyond the immediate footprint of development, urban, suburban, and rural growth patterns have fractured the landscape. Land-use planning and zoning laws have allowed sprawling development, including residential projects that are located far from existing urban centers, requiring new roads and infrastructure, along with communities designed with large lot sizes and little or no preserved open space. Presently, the region's remaining rural areas and natural lands are highly threatened by zoning for 4- to 8-acre lots for rural ranchette-style development.

As in other provinces, these development patterns not only reduce the amount of habitat available but also degrade the quality of adjacent habitat. With the expansion of the urban-wildland interface, remaining natural lands become more vulnerable to the incursion of invasive plants and animals, air and water pollution, and altered fire regimes. Developed areas, roads, and utility corridors fragment landscapes and sever connections between habitat areas.

Invasive Plants/Animals

As in other provinces across the state, invasive species problems on the South Coast are tied to regional land use and management issues.

In terrestrial ecosystems, a number of highly aggressive non-native plant species invade grasslands and scrub, including yellow starthistle, artichoke thistle, medusahead, Pampas grass, fennel, pepper weed, black mustard, and castor bean. These species lower habitat quality for sensitive wildlife species such as the Quino checkerspot butterfly and the California gnatcatcher. Some of these species dry out earlier in the summer than native species and contribute to increased wildfire frequencies. Access roads and rights-of-way for infrastructure and powerline maintenance, as well as recreational use of natural areas, can facilitate the spread of these species. In addition to degrading habitat quality, invasive species change the community structure and composition within the target habitats, making them more vulnerable to altered fire regimes.

Among terrestrial animals, Argentine ants pose a significant regional threat. Favoring irrigated areas and edge habitats, such as irrigated golf courses and residential neighborhoods, Argentine ants tend to outcompete and displace native ants in the region's fragmented landscapes, disrupting larger community food-web relationships. For example, the coast horned lizard (a state species of concern), whose major prey is native harvester ants, cannot sustain itself on a diet of Argentine ants and so can be driven locally extinct in fragmented habitat patches. Two pest species of boring beetles adversely affect trees and woodland habitats in portions of southern California. The goldspotted oak borer feeds beneath the bark of oak trees and damages tissues of the main stem and larger branches, eventually causing tree damage and mortality. The polyphagous shot hole borer is a relatively new pest in southern California; it infects a variety of tree species with a fungus, sometimes resulting in tree damage or mortality.

Nest parasitism by brown-headed cowbirds also threatens many of the region's sensitive bird species, including least Bell's vireo, southwestern willow flycatcher, and California gnatcatcher. Although a native species, cowbirds thrive in many human-altered habitats, including suburban areas and agricultural and grazing lands, where they are attracted to livestock droppings and feed. With the expansion of these land uses over the last century, cowbirds have thrived, greatly expanding both their range and population across California. Other problems are caused by introduced red fox, feral animals, and pets, which prey upon native wildlife, particularly ground-nesting birds.

European starling, introduced from Europe and now widespread in the region and in most human-modified habitats across much the state, aggressively competes with native woodpeckers, bluebirds, and other native song birds for cavity nest sites. In aquatic systems, the most problematic exotic plant species is *Arundo*, or giant reed. *Arundo* is widespread along major coastal river basins, particularly the Ventura, Santa Clara, Santa Ana, Santa Margarita, San Luis Rey and San Diego rivers. Tamarisk is less widespread but also invades regional riparian habitats. Tamarisk is distributed in coastal and desert drainages (Stephenson and Calcarone 1999). Both species choke waterways, increase flash flood risks, crowd out native plants, and provide inferior habitat for riparian species. Tamarisk also consumes prodigious amounts of

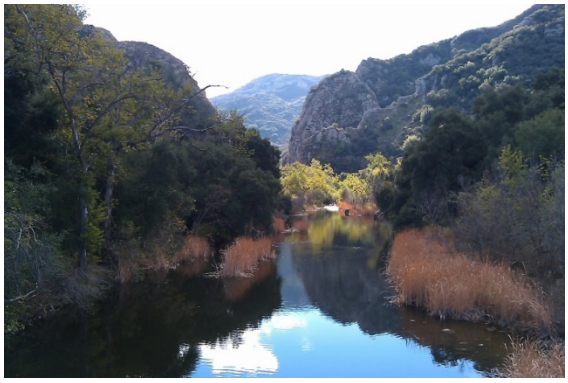
water, reducing available surface water, and *Arundo* provides limited shade, resulting in higher water temperatures and lower dissolved oxygen levels.

Among exotic wildlife species, bullfrogs, African clawed frogs, non-native crayfish, mosquito fish (which are sometimes introduced for mosquito control), and introduced sport and bait fish (including sunfish, bass, bluegill, carp, and fathead minnow) all pose predatory or competitive threats to native fish and amphibians, particularly in stream systems. Many of these species are well adapted to the deep water conditions in ponded areas above dams, and dam releases can introduce them to downstream habitats. Most voracious and widespread are bullfrogs, which are documented predators of California red-legged frogs, California tiger salamanders, arroyo toads, western pond turtles, and two-striped garter snakes (Stephenson and Calcarone 1999). A broad diet and an extended breeding season give bullfrogs a competitive advantage over native amphibians. Additionally, human-modified habitats favor bullfrogs. They can tolerate elevated water temperatures and, unlike native amphibians, make use of standing pools resulting from urban runoff to complete their two-year life cycle.

Aquatic invasive species pose a serious threat to aquatic habitat functions and ecosystem stability. In the South Coast Province, aquatic invasive animal species of concern include quagga mussel, New Zealand mud snail, African clawed frog, Asian clam, and bullfrog.

Recreational Activities

With nearly 20 million people living within driving distance of the region's national forests and other public lands, outdoor recreational access and its effects are a major concern. Recreational off-highway vehicle (OHV) use, particularly illegal use within protected conservation areas, can have adverse effects on natural communities and sensitive species. On public lands, OHV trails can open relatively undisturbed areas to increased use. The vehicles can disturb or run over wildlife, crush and uproot plants, spread seeds of invasive plants, and disturb soils, contributing to erosion and sedimentation of aquatic habitats. OHV use also increases the risk of human-caused fires.



NPS

Concentrated recreational use of streams and riparian areas is of particular concern in some locations. Hikers, picnickers, and equestrians, in large numbers, can damage these systems by reducing vegetative cover and disturbing sensitive species. Some recreational users build rock dams on streams to create ponds for swimming. The San Gabriel River, for example, has been altered by extensive ponded areas, as well as other effects of heavy recreational use, such as the deposition of trash and human waste (California Department of Fish and Game [CDFG] 2005). Particularly vulnerable riparian species include the two-striped garter snake, southern mountain yellow-legged frog, and arroyo toad (Stephenson and Calcarone 1999).

Intensive recreational activities not only reduce the amount of habitat available, but can also degrade the quality of the habitat in some cases. Habitats become more vulnerable to the incursion of invasive plants and animals, air and water pollution, and altered fire regimes. Roads and trails fragment landscapes and sever connections between habitat areas.

Although recreation activities adversely affect biological resources in many cases, the specific effects of recreational uses on wildlife depend on several factors, including the type, magnitude, frequency, and predictability of recreation activity; location and timing of activity (e.g., seasonal and time of day); habitat types exposed to the activities; and the sensitivity of a species based on its life history characteristics (Knight and Cole 1995).

Annual and Perennial Non-Timber Crops

Despite the large urban population, the South Coast is still a base for significant agricultural production. Los Angeles County was once the most important agricultural county in the United States, measured by the value of its agricultural production. The South Coast's moderate climate and usually frost-free growing seasons make it suitable for high-value crops. Nursery products, foliage and flowers, avocados, citrus, strawberries, and wine grapes are the main crops in the region (Johnston 2003).

In agricultural river valleys, substantial habitat alteration results from river diversions and water use. Many small-scale irrigation diversions deplete the flows of regional river systems, sometimes resulting in rivers completely drying up. Stream habitats are also adversely affected by sedimentation. Agricultural consequences for the region's wildlife and ecosystems include runoff of agricultural chemicals and sediment, consumption of oversubscribed water resources, and conversion and fragmentation of habitat.

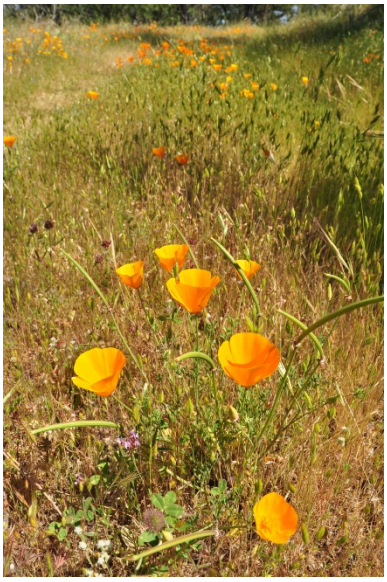
Climate Change

The projected climate changes in the South Coast are expected to mainly intensify patterns that are characteristic of a semi-arid Mediterranean climate (periodic droughts, intense cyclonic rainstorms, dry and hot summers). An important factor for coastal populations is the continuing role of the ocean in moderating coastal climates because of its high heat capacity (NMFS 2012).

Temperature

Average annual temperatures across both the coastal and mountainous regions of the South Coast province are expected to increase between 1.7 to 2.2°C (3.1 to 4.0°F) by 2070 (PRBO 2011). January average temperatures are expected to increase 0.6 to 1.4°C (1 to 2.5°F) by 2050 and 2.8 to 3.3°C (5 to 6°F) by 2100. July average temperature increases are projected from 1.7 to 2.2°C (3 to 4°F) by 2050 and 2.8 to 5.6°C (5 to 10°F) by 2100, with larger increases projected inland (California Emergency Management Agency [CalEMA] 2012).

Precipitation



Annual precipitation is expected to vary by area but decline overall throughout the 21st century. Low-lying coastal areas will lose up to 5 cm (2 inches) by 2050 and 7.6 to 12.7 cm (3 to 5 inches) by 2090, while high elevations will see a drop of 10.2 to 12.7 cm (4 to 5 inches) by 2050 and 20.3 to 25.4 cm (8 to 10 inches) by 2090 (CalEMA 2012). Annual rainfall will decrease in the most populous, urbanized areas. Wetter areas like the western part of Riverside and southwestern San Bernardino counties will experience a 5 to 10 cm (2 to 4 inch) decline by 2050 and 8.9 to 15.2 cm (3.5 to 6 inch) decline by the end of the century. Annual rainfall in the Big Bear vicinity is expected to decline by approximately 20.3 cm (8 inches) by 2090. Southern Imperial County is projected to experience a small decline of about 1.3 cm (0.5 inches).

March snowpack in the San Gabriel Mountains will decrease from the 1.8 cm (0.7-inch) level in 2010 to zero by the end of the century. Snowpack is also expected to decline and disappear at similar rates in the Big Bear area by the end of the century (CalEMA 2012).

Wildfire Risk

Little change is projected in the already high fire risk in this region, although slight increases are expected in a few coastal mountainous areas such as near Ojai and in Castaic, Fallbrook, and Mission Viejo.

Sea-Level Rise

By 2100, sea levels may rise 1.4 m (55 inches) or more, posing threats to many areas in the region including Venice Beach, the Port of Long Beach, the South Coast naval stations, and San Diego Harbor. As a result of sea level rise, 45 percent more land in Los Angeles County, 40 percent more land in San Diego County, 35 percent more land in Ventura County, and 28 percent more land in Orange County will be vulnerable to 100-year floods (CalEMA 2012).

5.5.6 Conservation Strategies

Conservation strategies were developed for four conservation targets in the South Coast Province. The goals for each target are listed below. The strategies to achieve the goals for the target are provided, along with the objectives of the strategies and the pressures intended to be reduced by implementing the strategies. When specific actions have been identified for the strategies, they are also listed. Tables 5.5-5 through 5.5-8 show the relationship between the stresses and the pressures for each target. Table 5.5-9 summarizes conservation strategies for the province.

Target: California Grassland and Flowerfields

Goals:

- By 2025, acres of habitat are increased by at least 5 percent from 2015 acres.
- By 2025, acres connected are increased by at least 5 percent from 2015 acres.
- By 2025, acres with desired endemic plant/animal diversity are increased by at least 5 percent from 2015 acres.
- By 2025, acres with desired structural diversity are increased by at least 5 percent from 2015 acres.
- By 2025, populations of key species are increased by at least 5 percent from 2015 population.
- By 2025, acres/miles with desired plant/animal diversity are increased by at least 5 percent from 2015 acres/miles.
- By 2025, acres with desired genetic connectivity are increased by at least 5 percent from 2015 acres.
- By 2025, acres/miles with natural hydrologic regime are increased by at least 5 percent 2015 from acres/miles.

Conservation Strategy 1 (Land Acquisition/Easement/Lease): Acquire and conserve high-value grassland habitats.

Objective(s):

- Identify and conserve high value grassland habitat.

Intended pressure(s) reduced: Housing and urban areas; annual and perennial non-timber crops; livestock, farming, and ranching.

Conservation action(s):

- Coordinate with Non-Governmental Organizations (NGOs), such as regional land trusts, to develop regional conservation strategies.

Conservation Strategy 2 (Data Collection and Analysis): Gather and analyze data to establish baseline inventory of SGCN distribution.

Objective(s):

- Establish a baseline inventory of SGCN distribution.

Intended pressure(s) reduced: Housing and urban areas; annual and perennial non-timber crops; livestock, farming, and ranching; invasive plants/animals; recreational activities; climate change; fire and fire suppression.

Conservation Strategy 3 (Direct Management): Reduce extent and spread of invasive species, with emphasis on ecosystem function for SGCN.

Objective(s):

- Reduce the extent and spread of invasive species.

Intended pressure(s) reduced: Livestock, farming, and ranching; invasive plants/animals.

Conservation action(s):

- Identify areas with greatest restoration potential.
- Develop management plans.
- Identify funding sources to implement management plans.
- Partner with California Invasive Plant Council on training, management, and advocacy.
- Identify appropriate and effective restoration techniques for each location.
- Identify restoration success criteria.
- Develop and implement monitoring plan.
- Implement priority invasive plant removal.
- Develop invasive plant tax.
- Develop public outreach program.
- Restore and enhance native plant species.

Conservation Strategy 4 (Management Planning): Coordinate with U.S. Department of Fish and Wildlife (USFWS) and other agencies to assist local jurisdictions with conservation of grasslands (e.g., via the natural communities conservation plan/habitat conservation plan process) in light of increasing extent of vineyard development in grasslands.

Objective(s):

- Influence the decision making process.

Intended pressure(s) reduced: Annual and perennial non-timber crops; invasive plants/animals.

Conservation action(s):

- Identify and prioritize areas of conservation emphasis (ACEs).
- Identify existing conserved areas.
- Pursue conservation easements and habitat acquisitions to protect grassland habitats.
- Encourage/promote the use of Natural Community Conservation Plans (NCCPs) to identify and prioritize conservation areas.
- Direct project mitigation to priority areas needing conservation.
- Direct and use conservation banking.
- Create ACE database viewable by all CDFW staff.
- Split parcels for conservation.
- Incorporate conservation goals and best management practices (BMPs) into California Environmental Quality Act (CEQA) comment letters.
- Provide input at local government public meetings on relevant land use decisions.

Conservation Strategy 5 (Partner Engagement): Partner for joint advocacy for the conservation of natural resources.

Objective(s):

- Establish partnerships with agencies and landowners that benefit wildlife.
- Implement habitat restoration projects jointly with agencies and landowners that benefit wildlife.

Intended pressure(s) reduced: Livestock, farming, and ranching; fire and fire suppression; invasive plants/animals.

Conservation action(s):

- Advocate for appropriate grazing practices.
- Review existing ranching and grazing BMPs.
- Partner and advocate for reducing rodenticide use.
- Work with Natural Resources Conservation Service to modify BMPs as needed.
- Incorporate BMPs into CEQA comment letters.
- Identify key private land owners to whom outreach is directed.
- Advocate for prescribed burns where appropriate (e.g., where risk of conversion of native habitat types as a result of burning is low).
- Advocate for post-burn weed control.
- Work with local governments to incorporate structural fire treatments (e.g., building hardening, boxed eves, fire rated windows, etc.) to minimize impacts at the urban/wildland interface.

Table 5.5-5 Stresses and Pressures for California Grassland and Flowerfields

Priority pressures	Stresses							
	Changes in geophysical and disturbance regime	Changes in soil characteristics			Ecosystem changes			
	Change in natural fire regime	Change in soil moisture	Change in pollutants	Change in nutrients	Change in spatial extent of target	Change in biotic interactions	Changes community structure or composition	Habitat fragmentation
Annual and perennial non-timber crops	X					X	X	
Climate change								
Fire and fire suppression	X					X	X	
Housing and urban areas	X					X	X	
Invasive plants/animals	X					X	X	
Livestock, farming, and ranching		X	X	X	X			X
Recreational activities						X	X	

Target: American Southwest Riparian Forest and Woodland

Goals:

- By 2025, area of the community is maintained or increased by at least 5 percent in every watershed throughout the ecoregion.
- By 2025, the amount of continuous riparian habitat is increased by at least 5 percent.
- By 2025, the range of more than one riparian SGCN is maintained or increased by at least 5 percent.
- By 2025, the number of stream miles that display the full range of age classes and vegetation layers (herb, shrub, subtree, trees) are increased by at least 5 percent from 2015 levels.
- By 2025, miles of surface water flows, both ephemeral and permanent, are restored to mimic historic patterns (hydrographs) of flooding and low flow patterns by at least 5 percent from 2015 miles.
- By 2025, at least 5 percent of riparian habitat (acres) are dominated by native species.
- By 2025, greater than 5 percent of the riparian areas display functional connectivity.

Conservation Strategy 1 (Land Acquisition/Easement/Lease): Acquire and conserve high-functioning riparian areas that have the greatest ecological potential (e.g., Santa Clara, San Luis Rey, and Ventura River watersheds, followed by larger impaired systems and those that support SGCN), and functioning riparian habitat on private property.

Objective(s):

- Increase riparian habitat function and protection on private property (e.g., through conservation easement on agricultural land, fencing of cattle, limiting water diversions, and erosion control).

*Intended pressure(s) reduced***:** Housing and urban areas; livestock, farming, and ranching.

Conservation action(s):

- Purchase lands or secure easements from willing sellers through grants and other funding sources.
- Integrate National Pollutant Discharge Elimination System (NPDES) permitting and NCCPs to allow water quality mitigation to complement habitat conservation planning.

Conservation Strategy 2 (Data Collection and Analysis): Gather and analyze data to establish baseline inventory of SGCN distribution, habitats, and pressures.

Objective(s):

- Establish baseline inventory of SGCN/habitat and threat distributions.

Intended pressure(s) reduced: Livestock, farming, and ranching; housing and urban areas; tourism and recreation areas; garbage and solid waste; household sewage and urban waste water; avalanches/landslides; fire and fire suppression; dams and water management/use; invasive plants/animals.

Conservation Strategy 3 (Outreach and Education): Provide outreach and education focused on improving vegetation structural diversity, reducing infestations of invasive species (for plants, specifically *Arundo* and tamarisk), and protecting functioning riparian habitat on private property.

Objective(s):

- Improve vertical and horizontal structural diversity of riparian habitat.
- Reduce the aerial extent of invasive infestations (to 35-50 percent of area that has invasive plant infestations [specifically *Arundo* and tamarisk] and/or invasive animal species). For controlling riparian invasive plant species such as *Arundo* and tamarisk, this objective includes identifying upstream stream bank sources.
- Increase riparian habitat function on private property.

Intended pressure(s) reduced: Invasive plants/animals.

Conservation Strategy 4 (Law and Policy): Advocate for effective enforcement laws to reduce impacts of waste and disturbance on significant riparian areas.

Objective(s):

- Reduce the number of riparian areas that are impacted by waste and disturbance.

Intended pressure(s) reduced: Garbage and solid waste; household sewage and urban waste water.

Conservation Strategy 5 (Direct Management): Manage invasive species, with focus on reducing the extent of invasive species (particularly *Arundo* and tamarisk) and improving structural diversity of native vegetation.

Objective(s):

- Improve vertical and horizontal structural diversity of riparian habitat.
- Reduce the aerial extent of invasive infestations (to 35-50 percent of area that has invasive plant infestations [specifically *Arundo* and tamarisk] and/or invasive animal species).

Intended pressure(s) reduced: Invasive plants/animals.

Conservation action(s):

- Identify areas with greatest restoration potential and upstream sources of invasive species.
- Develop management plans.
- Identify and develop restoration partnerships.
- Identify appropriate and effective restoration techniques for each location.
- Identify restoration success criteria.
- Develop and implement monitoring plan.
- Implement priority invasive removal.
- Develop invasive plant tax.
- Develop public outreach program.
- Restore and enhance native plant species.
- Streamline permitting for restoration projects.

Conservation Strategy 6 (Direct Management): Manage barriers to water movement, with focus on improving stream water volume, groundwater levels, vegetation age-class heterogeneity, channel pattern, and seasonal flow variation.

Objective(s):

- Restore ephemeral and perennial surface water flows to mimic historic patterns of flooding and low-flow patterns (+/- 25 percent).
- Maintain low flows to sustain aquatic species.
- Increase age class heterogeneity and successional dynamics in impaired areas to maintain at least two age classes.
- Reduce channel incision and increase riparian vegetation in floodplains.
- Restore seasonal flow variation (so that annual hydrographs track the natural hydrographs of drainages [+/- 10 percent], particularly in reaches with breeding amphibian SGCN).
- Increase and maintain ground water levels.

Intended pressure(s) reduced: Dams and water management/use.

Conservation action(s):

- Inventory barriers and assess flow and water condition.
- Coordinate with private landowners.
- Prioritize watershed or reaches for barrier treatment.
- Develop an eco-regional water management plan.
- Obtain permits, conduct environmental review.
- Implement water management plan.
- Coordinate with the various dam operators to discuss opportunities and constraints.
- Engage in State Water Resources Control Board (SWRCB) permitting process.
- Streamline permitting for conservation projects.

Conservation Strategy 7 (Management Planning): Engage in local planning to encourage the use of bio (soft)-engineering for flood control, retention of functional floodplains, and deterrence and capture of waste and pollution.

Objective(s):

- Restore ephemeral and perennial surface water flows to mimic historic patterns of flooding and low-flow patterns (+/- 25 percent), maintain low flows to sustain aquatic species.
- Improve vertical and horizontal structural diversity of riparian habitat.
- Reduce the aerial extent of invasive infestations (to 35-50 percent of area that has invasive plant infestations [specifically *Arundo* and tamarisk] and/or invasive animal species).
- Increase SGCN diversity to 50-70 percent of historic/normal conditions
- Reduce channel incision and increase riparian vegetation in floodplains.
- Reduce the number of riparian areas that are impacted by waste and disturbance.

Intended pressure(s) reduced: Garbage and solid waste; household sewage and urban waste water; dams and water management/use.

Conservation action(s):

- Encourage use of bio filters for urban runoff.
- Maintain treated effluent flows into riparian areas.
- Engage in development and implementation of Integrated Regional Management Plans.
- Direct increased resources/staffing towards engagement in local planning.
- Encourage appropriate site-specific native riparian plants for adjacent landscaping.
- Communicate BMPs to local planners.
- Obtain funding for program implementation.
- Identify key areas within watersheds where wetland banks to streamline NPDES permitting can be established to improve water quality and provide benefits to biological resources.
- Integrate NPDES permitting and NCCPs to allow water quality mitigation to complement habitat conservation planning.

Table 5.5-6 Stresses and Pressures for American Southwest Riparian Forest and Woodland

Priority pressures	Climate factors	Changes in hydrology and water characteristics					Ecosystem changes				
	Change in precipitation	Change in runoff and river flow	Change in groundwater tables	Change in flood occurrence, frequency, intensity, and area flooded (including hydroperiod)	Change in water levels and hydroperiod	Change in pollutants	Change in spatial extent of target	Changes succession processes and ecosystem development	Change in biotic interactions (altered community dynamics)	Habitat fragmentation	Change in community structure or composition
Avalanches/landslide					X						
Dams and water management/use					X						
Fire and fire suppression					X						
Garbage and solid waste	X								X		
Household sewage and urban waste water	X								X		
Housing and urban areas		X						X	X		
Invasive plants/animals											X
Livestock, farming, and ranching				X							
Mining and quarrying							X				
Recreational activities			X								
Roads and railroads										X	
Tourism and recreation areas		X						X			

Target: Native Fish Assemblage

Goals:

- By 2025, at least 5 percent more streams contain their historic native fish composition.
- By 2025, at least two more streams have improved connectivity.
- By 2025, increase by at least 5 percent the ratio of native fish to non-native fish in Big Tujunga Creek, Haines Creek, and the Santa Clara River mainstem.
- By 2025, all species and their life stages are present and commonly encountered during summer fish surveys within their currently known range.
- By 2025, suitable flows are released to maintain target populations below Big Tujunga and Cogswell dams.
- By 2025, maintain or increase by at least 5 percent the natural hydrologic regime in coastal lagoons that support target species.

Conservation Strategy 1 (Land Acquisition/Easement/Lease): Protect and restore unarmored threespine stickleback (UTS) habitat within the Santa Clara River mainstem, Soledad Canyon, and Bouquet Canyon.

Objective(s):

- Protect and enhance UTS habitat within the Santa Clara River mainstem, Soledad Canyon, and Bouquet Canyon.

Intended pressure(s) reduced: Dams and water management/use; housing and urban areas.

Conservation action(s):

- Develop and implement restoration and acquisition projects and funding sources.
- Survey and map extent of UTS populations in all three streams.
- Survey and map all potential UTS habitat in the three streams.
- Provide education and outreach.
- Obtain funding for plan implementation and staff.

Conservation Strategy 2 (Data Collection and Analysis): Collect and analyze data to establish a baseline inventory of SCGN distribution.

Objective(s):

- Establish baseline inventory of SGCN distribution.
- Complete comprehensive UTS surveys in the Santa Clara watershed with focus on Soledad and Bouquet Canyons.

Intended pressure(s) reduced: Dams and water management/use; housing and urban areas.

Conservation Strategy 3 (Data Collection and Analysis): Identify areas that may act as climate refugia.

Objective(s):

- Identify representative habitats to accommodate species movement and adaptation.

Intended pressure(s) reduced: Climate change.

Conservation Strategy 4 (Outreach and Education): Implement outreach.

Objective(s):

- Raise public awareness and support for native fish restoration projects.
- Educate public on risks of invasive species and importance of aquatic biodiversity management plans.

Intended pressure(s) reduced: Recreational activities; invasive plants/animals.

Conservation Strategy 5 (Direct Management): Translocate species to increase current distribution; specifically, translocate Santa Ana sucker, Santa Ana speckled dace, and UTS into suitable habitat in the Big Tujunga, San Gabriel, and Santa Clara watersheds.

Objective(s):

- Increase the distribution of native fish.

Intended pressure(s) reduced: Dams and water management/use; recreational activities; invasive plants/animals.

Conservation action(s):

- Develop a translocation plan.
- Work with federal agencies and flood control agencies to identify constraints and obtain buy-in.
- Monitor target fish populations.
- Obtain funding for plan implementation and staff.

Conservation Strategy 6 (Direct Management): Improve fish passage by working with federal, state, and local agencies to identify and remove key fish barriers to fish movement and sediment flow, and keep priority areas barrier free.

Objective(s):

- Assess, prioritize, and remove/modify fish passage barriers.

Intended pressure(s) reduced: Dams and water management/use; roads and railroads.

Conservation action(s):

- Develop barrier assessment protocols.
- Develop barrier removal guidelines, BMPs, and plan to monitor barrier removal effectiveness.
- Obtain funding for plan implementation and staff.
- Coordinate with state, federal agencies, local government, and private landowners.
- Identify partners.

Conservation Strategy 7 (Direct Management): Protect and restore floodplain function.

Objective(s):

- Align policies, regulations, planning, and agency coordination to support multi-benefit floodplain management; implement and maintain priority floodplain restoration projects.

Intended pressure(s) reduced: Annual and perennial non-timber crops; housing and urban areas; mining and quarrying.

Conservation Strategy 8 (Direct Management): Restore natural flows.

Objective(s):

- Identify streams/reaches in greatest need of flow remediation and create plans for restoration.
- Monitor restored stream reaches for recolonization and implement translocation, as necessary, to re-establish populations.
- Work with relevant agencies and partners to develop a flow prescription for Bouquet Creek and the Santa Clara River.

Intended pressure(s) reduced: Dams and water management/use; recreational activities; invasive plants/animals.

Conservation action(s):

- Monitor flow compliance.
- Identify partners.
- Coordinate with state and federal agencies, local governments, and private landowners.
- Monitor fish populations.
- Obtain funding for plan implementation and staff.

Conservation Strategy 9 (Direct Management): Control invasive species.

Objective(s):

- Assess, map, and develop control plans for invasive aquatic species.

Intended pressure(s) reduced: Invasive plants/animals.

Conservation action(s):

- Compile maps of invasive species already completed for planning area.
- Conduct additional mapping as necessary to fill gaps.
- Develop control plans for priority species.
- Develop Invasives Coordination Group to streamline and coordinate current agencies, organizations, activities.
- Implement priority species control plans.
- Map invasive species and develop control plans.
- Implement top-priority controls plans.
- Monitor invasive species and continue removal efforts as needed to control populations.
- Implement outreach and education specific to spread of invasive species.

Table 5.5-7 Stresses and Pressures for Native Fish Assemblage

Priority pressures	Climate factors					Changes in hydrology and water characteristics						Ecosystem changes		
	Change in CO_2 levels	Change in annual average temperatures	Change in annual average precipitation	Change in snow pack	Change in snow cover period	Change in runoff and river flow	Change in groundwater tables	Change in water levels and hydroperiod	Change in flood occurrence, frequency, intensity, and area flooded (including hydroperiod)	Change in pollutants	Changes in nutrients	Changes succession processes and ecosystem development	Change in community structure or composition	Habitat fragmentation
Annual and perennial non-timber crops												X		
Climate change	X	X	X	X	X	X	X	X	X					
Dams and water management/use						X	X							X
Household sewage and urban waste water										X	X			
Housing and urban areas								X				X		
Invasive plants/animals													X	
Mining and quarrying												X		
Recreational activities												X		

Target: South Coast Native Aquatic Herp Assemblage

Goals:

- By 2025, area occupied by assemblage is increased by at least 5 percent from 2015 levels.
- By 2025, all populations contain both juvenile (egg and tadpole) and adult life stages in adequate abundance to ensure population sustainability.
- By 2025, non-native invasive aquatic species will be reduced by at least 5 percent within sensitive amphibian habitat, and their source populations identified to aid recovery of native amphibians.
- By 2025, restore flow regimes to provide an increase by at least 5 percent in access to suitable habitat for native species.

Conservation Strategy 1 (Land Acquisition/Easement/Lease): Protect land in fee or with conservation easements, with focus on riparian habitats that have the greatest ecological potential such as larger impaired systems and those that support SGCN.

Objective(s):

- Increase riparian habitat function and protection on private property (e.g., through conservation easement on agricultural land, fencing of cattle, limiting water diversions, and erosion control).
- Conserve high functioning riparian areas, with focus on areas that have the greatest ecological potential such as larger impaired systems and those that support SGCN.

Intended pressure(s) reduced: Annual and perennial non-timber crops; housing and urban areas; invasive plants/animals; recreational activities.

Conservation action(s):

- Purchase lands or secure conservation easements from willing sellers through grants and other funding sources.
- Encourage/promote the use of NCCPs to identify and prioritize conservation areas.
- Implement in lieu fee program.
- Develop Conceptual Area Protection Plans (CAPPs).
- Identify and prioritize Areas of Conservation Emphasis (ACE).
- Obtain funding for program implementation, land acquisition and restoration.
- Identify existing conserved areas.
- Direct project mitigation to priority areas needing conservation.
- Direct and use conservation banking.
- Create ACE database viewable by all CDFW staff.
- Split parcels for conservation.
- Identify which parcels to be acquired in fee or as conservation easement.
- Conduct baseline inventory.

Conservation Strategy 2 (Data Collection and Analysis): Conduct research to identify causal mechanism for Chytrid fungus and prevent its spread in amphibian populations.

Objective(s):

- Identify causal mechanisms for Chytrid fungus and prevent its spread in amphibian populations.

Intended pressure(s) reduced: Parasites/pathogens/diseases.

Conservation action(s):

- Conduct literature review.
- Gather existing information.
- Develop study design.
- Consult with experts.
- Obtain funding.

Conservation Strategy 3 (Outreach and Education): Provide outreach and education.

Objective(s):

- Educate public on impacts associated with their activities and damage to native species from introduction of native species.
- Keep public informed on development and status of BMPs.

*Intended pressure(s) reduced***:** Recreational activities; annual and perennial non-timber crops; invasive plants/animals.

Conservation Strategy 4 (Direct Management): Protect and restore habitat, and create riparian buffers adjacent to streams.

Objective(s):

- Create buffers of properly functioning riparian habitat adjacent to streams.

Intended pressure(s) reduced: Housing and urban areas; recreational activities; annual and perennial non-timber crops; invasive plants/animals; annual and perennial non-timber crops.

Conservation Strategy 5 (Direct Management): Manage invasive species to improve conditions for native fish and aquatic herps.

Objective(s):

- Prevent additional future invasive species from becoming established, and manage invasive species levels to improve conditions for native fish.

Intended pressure(s) reduced: Invasive plants/animals.

Conservation action(s):

- Update data on extent and distribution of native and non-native species.
- Develop strategy for removal of non-native fish species and aquatic weeds.
- Coordinate with other agencies and private landowners.
- Obtain permits and environmental review if needed.
- Obtain funding for implementation and staff.
- Conduct management activities (electroshock, seine, etc.).
- Conduct post treatment monitoring.
- Initiate long-term monitoring and management plan.
- Implement mechanical and chemical treatment of invasive weeds within riparian areas.

Conservation Strategy 6 (Direct Management): Reintroduce native species.

Objective(s):

- Re-establish native amphibians and reptiles in their historic range.

Intended pressure(s) reduced: Invasive plants/animals; housing and urban areas.

Conservation action(s):

- Conduct feasibility analysis to identify target streams.
- Identify source population or propagate.
- Evaluate control methods for non-native species.
- Develop reintroduction plan including post-treatment monitoring.
- Coordinate with agencies and non-governmental organizations.
- Conduct environmental review and obtain permits.
- Obtain funding for implementation and staff.

Conservation Strategy 7 (Direct Management): Manage flows, dams, and other barriers to best benefit aquatic herps and for fish passage.

Objective(s):

- Allow more bypass flows through water conservation and allow fish passage.

Intended pressure(s) reduced: Dams and water management/use.

Conservation action(s):

- Coordinate with state and federal agencies, counties, and private landowners.
- Inventory barriers and assess flow and water condition.
- Develop plan for prioritization and construction.
- Obtain funding for implementation and staffing.
- Obtain permits, conduct environmental review.
- Remove or retrofit barriers.
- Implement water conservation flow.

Table 5.5-8 Stresses and Pressures for South Coast Native Aquatic Herp Assemblage

Priority pressures	Climate factors					Changes in hydrology and water characteristics					Ecosystem changes		
	Change in CO_2 levels	Change in annual average temperatures	Change in annual average precipitation	Change in snow pack	Change in snow cover period	Change in runoff and river flow	Change in groundwater tables	Change in water levels and hydroperiod	Change in pollutants	Changes in nutrients	Change in spatial distribution of habitat types	Change in community structure or composition	Habitat fragmentation
Annual and perennial non-timber crops						X							
Climate change	X	X	X	X	X								
Housing and urban areas						X	X	X	X	X	X	X	
Invasive plants/animals											X	X	X
Other ecosystem modifications											X		X
Parasites/pathogens/diseases											X		
Recreational activities											X		
Roads and railroads											X		X

Table 5.5-9 Conservation Targets and Strategies for the South Coast Province

Target	Goals	Key Ecological Attributes (KEAs)	Pressures[1]	Strategy Categories
California Grassland and Flowerfields	▪ By 2025, acres of habitat are increased by at least 5% from 2015 acres. ▪ By 2025, acres connected are increased by at least 5% from 2015 acres. ▪ By 2025, acres with desired endemic plant/animal diversity are increased by at least 5% from 2015. ▪ By 2025, acres with desired structural diversity are increased by at least 5% from 2015 acres. ▪ By 2025, populations of key species are increased by at least 5% from 2015 population levels. ▪ By 2025, acres/miles with desired plant/animal diversity are increased by at least 5% from 2015 acres/miles. ▪ By 2025, acres with desired genetic connectivity are increased by at least 5% from 2015 acres. ▪ By 2025, acres/miles with natural hydrologic regime are increased by at least 5% from 2015 acres/miles.	▪ Area and extent of community ▪ Fire regime ▪ Connectivity among communities and ecosystems ▪ Successional dynamics ▪ Key species population levels ▪ Endemic diversity ▪ Native versus non-native diversity ▪ Soil and sediment deposition regimes ▪ Nutrient concentrations and dynamics	▪ Annual and perennial non-timber crops ▪ Climate change ▪ Fire and fire suppression ▪ Housing and urban areas ▪ Invasive plants/animals ▪ Livestock farming and ranching ▪ Recreational activities	▪ Data Collection and Analysis ▪ Partner Engagement ▪ Management Planning ▪ Direct Management ▪ Land Acquisition/ Easement/ Lease
American Southwest Riparian Forest and Woodland	▪ By 2025, area of the community is maintained or increased by at least 5% in every watershed throughout the ecoregion. ▪ By 2025, the amount of continuous riparian habitat is increased by at least 5% from 2015 levels. ▪ By 2025, the range of more than one riparian SGCN is maintained or increased by at least 5%. ▪ By 2025, the number of stream miles that display the full range of age classes and vegetation layers (herb, shrub, subtree, trees) are increased by at least 5% from 2015 levels. ▪ By 2025, miles of surface water flows, both ephemeral and permanent, are restored to mimic historic patterns (hydrographs) of flooding and low flow patterns by at least 5% from 2015 miles. ▪ By 2025, at least 5% of riparian habitat (acres) are dominated by native species. ▪ By 2025, greater than 5% of the riparian areas display functional connectivity.	▪ Area and extent of community ▪ Connectivity among communities and ecosystems ▪ Key species population levels ▪ Structural diversity ▪ Native versus non-native diversity ▪ Hydrological regime ▪ Surface water flow regime ▪ Water level fluctuations	▪ Avalanches/landslide ▪ Dams and water management/use ▪ Fire and fire suppression ▪ Garbage and solid waste ▪ Household sewage and urban waste water ▪ Housing and urban areas ▪ Invasive plants/animals ▪ Livestock farming and ranching ▪ Mining and quarrying (no strategies) ▪ Recreational activities (no strategies) ▪ Roads and railroads (no strategies) ▪ Tourism and recreation areas	▪ Data Collection and Analysis ▪ Management Planning ▪ Direct Management ▪ Land Acquisition/ Easement/ Lease ▪ Law and Policy ▪ Outreach and Education
Native Fish Assemblage	▪ By 2025, at least 5% more streams contain their historic native fish composition. ▪ By 2025, at least two more streams have improved connectivity. ▪ By 2025, increase by at least 5% the ratio of native fish to non-native fish in Big Tujunga Creek, Haines Creek, and the Santa Clara River mainstem. ▪ By 2025, all species and their life stages are present and commonly encountered during summer fish surveys within their currently known range. ▪ By 2025, suitable flows are released to maintain target populations below Big Tujunga and Cogswell dams. ▪ By 2025, maintain or increase by at least 5% a natural hydrologic regime in coastal lagoons that support target species.	▪ Connectivity among communities and ecosystems ▪ Native versus non-native diversity ▪ Age class heterogeneity ▪ Diversity ▪ Surface water flow regime ▪ Water level fluctuations	▪ Annual and perennial non-timber crops ▪ Climate change ▪ Dams and water management/use ▪ Household sewage and urban waste water ▪ Housing and urban areas ▪ Invasive plants/animals ▪ Mining and quarrying ▪ Recreational activities	▪ Data Collection and Analysis ▪ Direct Management ▪ Land Acquisition/ Easement/ Lease ▪ Outreach and Education
South Coast Native Aquatic Herp Assemblage	▪ By 2025, area occupied by assemblage is increased by at least 5% from 2015 levels. ▪ By 2025, all populations contain both juvenile (egg and tadpole) and adult life stages in adequate abundance to ensure population sustainability. ▪ By 2025, non-native invasive aquatic species will be reduced by at least 5% within sensitive amphibian habitat, and their source populations identified to aid recovery of native amphibians. ▪ By 2025, restore flow regimes to provide an increase by at least 5% in access to suitable habitat for native species.	▪ Area and extent of community ▪ Native versus non-native diversity ▪ Age class heterogeneity ▪ Surface water flow regime	▪ Annual and perennial non-timber crops ▪ Climate change ▪ Housing and urban areas ▪ Invasive plants/animals ▪ Other ecosystem modifications ▪ Parasites/pathogens/diseases ▪ Recreational activities ▪ Roads and railroads	▪ Data Collection and Analysis ▪ Direct Management ▪ Land Acquisition/ Easement/ Lease ▪ Outreach and Education

[1] Pressures can be positive or negative depending on the intensity, timing, and duration of the action on the target habitat.