WATER QUALITY CONTROL PLAN
Los Angeles Region

Basin Plan
for the
Coastal Watersheds of
Los Angeles and Ventura Counties

California Regional Water Quality Control Board

Los Angeles Region (4)

WATER QUALITY CONTROL PLAN

Los Angeles Region

Adopted by

California Regional Water Quality Control Board, Los Angeles Region on June 13, 1994.

Approved by

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1. INTRODUCTION

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The State and Regional Boards

Responsibility for the protection of water quality in California rests with the State Water Resources Control Board (hereinafter referred to as the State Board) and nine Regional Water Quality Control Boards. The State Board sets statewide policies and develops regulations for the implementation of water quality control programs mandated by state and federal water quality statutes and regulations. Regional Water Quality Control Boards develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems.

The California Regional Water Quality Control Board, Los Angeles Region (hereinafter referred to as the Los Angeles Regional Board or Regional Board) has jurisdiction over the coastal drainages between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line (Figure 1-1). The Regional Board is governed by nine members, all of whom are appointed by the Governor and confirmed by the State Senate. Regional Board members represent certain categories related to the control of water quality and must reside in, or have a principal place of business within, the Region. Members of the Regional Board hold regular meetings at different sites throughout the Region. The staff at the Regional Board implement Regional Board policies under the direction of the Executive Officer who is appointed by the Regional Board. The public may address the Regional Board regarding any matter within the Regional Board's jurisdiction during the public forum period at any regular Regional Board meeting. Copies of the Regional Board meeting agendas are available for examination at the office of the Regional Board during regular working hours.

Function of the Basin Plan

The Los Angeles Regional Board's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan (i) designates beneficial uses for surface and ground waters, (ii) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy, and (iii) describes implementation programs to protect all waters in the Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Major State and Regional Board plans and policies are summarized in Chapter 5. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the Regional Board and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

The Basin Plan is reviewed and updated as necessary. Following adoption by the Regional Board, the Basin Plan and subsequent amendments are subject to approval by the State Board, the

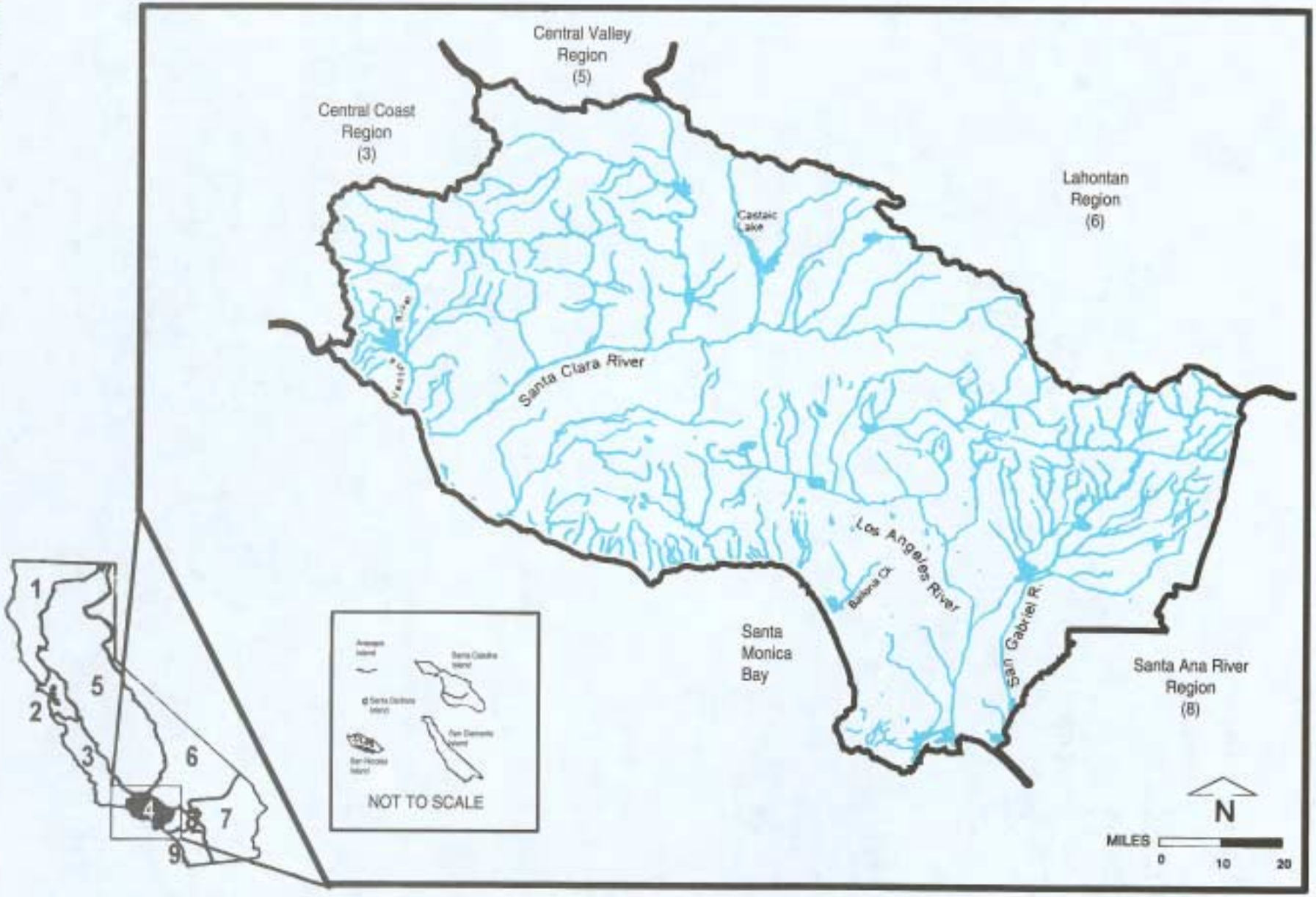


Figure 1-1. Regional Map: Regional Water Quality Control Board, Los Angeles Region.

State Office of Administrative Law (OAL), and the United States Environmental Protection Agency (USEPA).

Legal Basis and Authority

The Basin Plan implements a number of state and federal laws, the most important of which are the California Porter-Cologne Water Quality Control Act (California Water Code, Division 1, Chapter 2, Article 3, et seq., plus others) and the Clean Water Act (PL 92-500, as amended). Other pertinent state laws include: the Hazardous Substances Cleanup Bond Act of 1984 (Health & Safety Code, §25385 et seq.), the Toxic Pits Cleanup Act (Health & Safety Code, §25208 et seq.), and the Toxic Injection Well Control Act (Health & Safety Code, §25159.10 et seq.). Pertinent federal laws include: the Safe Drinking Water Act (42 U.S.C.A., §300F et seq.), the Toxic Substances Control Act (15 U.S.C.A., §2601 et seq.), the Resource Conservation and Recovery Act (RCRA, 42 U.S.C.A., §6 901 et seq.), and the Endangered Species Act (16 U.S.C.A., §1531 et seq.).

The Porter-Cologne Water Quality Control Act (herein after referred to as California Water Code), enacted by the State of California in 1969 and effective January 1, 1970, is considered landmark water quality legislation and has served as a model for subsequent legislation by the federal government and other state governments. This legislation authorizes the State Board to adopt, review, and revise policies for all waters of the state (including both surface and ground waters) and directs the Regional Boards to develop regional Basin Plans. The California Water Code (§13170) also authorizes the State Board to adopt water quality control plans on its own initiative. In the event of inconsistencies among various State and Regional Board plans, the more stringent provisions apply.

The Clean Water Act (CWA), enacted by the federal government in 1972, was designed to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. One of the national goals states that wherever attainable water quality should provide for the protection and propagation of fish, shellfish, and wildlife, and provide for recreation in and on the water (i.e., fishable, swimmable). The CWA (§303[c]) directs states to establish water quality standards for all "waters of the United States" and to review and update such standards on a triennial basis. Other provisions of the CWA related to basin planning include Section 208, which authorizes the preparation of waste treatment management plans, and Section 319 (added by 1987 amendments) which mandates specific actions for the control of pollution from nonpoint sources. The 1987 amendments to the CWA (§307[a]) also mandate that states adopt numerical standards for all priority pollutants.

The USEPA has delegated responsibility for implementation of portions of the CWA to the State and Regional Boards, including water quality planning and control programs such as the National Pollutant Discharge Elimination System (NPDES). The Code of Federal Regulations (Title 40, CFR) and USEPA guidance documents provide direction for implementation of the CWA.

Besides state and federal laws, several court decisions provide guidance for basin planning. For example, the 1983 Mono Lake Decision (National Audubon Society v. Superior Court [1993]) reaffirmed the public trust doctrine, holding that the public trust is "an affirmation of the duty of the state to protect the people's common heritage in streams, lakes, marshlands, and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust." Public trust encompasses uses of water for commerce, navigation, fisheries, and recreation. In California Trout, Inc. v. State Water Resources Control Board (1989), the courts found that the public trust doctrine also applies to activities that could harm the fisheries in a non-navigable water.

History of Basin Planning in the Los Angeles Region

The Dickey Act, enacted by the State of California in 1949, established nine Regional Water Pollution Control Boards in California. Regional Water Pollution Control Boards were directed to establish water quality objectives in order to protect the quality of receiving waters from adverse impacts of wastewater discharges. During the first few years, the Los Angeles Regional Water Pollution Control Board only established narrative objectives for discharges. By 1952, the Los Angeles Regional Water Pollution Control Board began including numerical limits in requirements for discharges and adopting water quality objectives for receiving waters.

With the enactment of the Porter-Cologne Water Quality Act in 1969, the names of the Regional Water Pollution Control Boards were changed to Regional Water Quality Control Boards, and their authorities were broadened. At this time, the Regional Water Quality Control Boards initiated development of comprehensive regional Basin Plans.

In 1971, the Los Angeles Regional Board adopted an *Interim Water Quality Control Plan* that compiled all of the existing objectives and policies into one document and rescinded all individually-adopted objectives and policies. A more comprehensive planning effort was undertaken when the State Board engaged Daniel, Mann, Johnson, and Mendenhall, Inc., and Koebig and Koebig, Inc. to develop Basin Plans for the Santa Clara River Basin and the Los Angeles River Basin, respectively. This major planning effort culminated in 1975 with the *Water Quality Control Plan for the Santa Clara River Basin (4A)* and the *Water Quality Control Plan for the Los Angeles River Basin (4B)*. These two documents, which together comprised the Basin Plans for the Los Angeles Region, were amended in 1978, 1990, and 1991. These two Basin Plans and amendments are superseded by this single Basin Plan which, for planning purposes, divides the Region into major surface watersheds and groundwater basins.

Since 1975, progress has been made toward the control of a number of water quality problems identified in the 1975 Basin Plans, including the control of point source discharges and the development of new programs to address nonpoint source pollution issues in the Region. At the same time, many new issues and areas of concern have arisen as health scientists have identified increasingly lower concentrations of toxic substances as health risks. Furthermore, advancing analytical technology enables detection of contaminants at increasingly lower concentrations. The State and Regional Board's Continuing Planning Process, based on the latest scientific information, addresses both "old" and "new" water quality issues.

Continuing Planning Process

As part of the State's Continuing Planning Process, components of the Basin Plan are reviewed as new data and information become available or as specific needs arise. Comprehensive updates of the Basin Plan occur in response to state and federal legislative requirements and as funding becomes available. State Board and other governmental entities' (federal, state and local) plans, that can affect water quality, are incorporated into the planning process. In addition, the Basin Plan provides consistent long-term standards and program guidance for the Region.

Triennial Review Process

The California Water Code, (§13240), directs the State and Regional Boards to periodically review and update Basin Plans. Furthermore, the CWA (§303 [c]) directs states to review water quality standards every three years (triennial review) and, as appropriate, modify and adopt new standards.

In the Triennial Review Process, basin planning issues are formally identified and ranked during the public hearing process. These and other modifications to the Basin Plan are implemented through Basin Plan amendments as described below. In addition, the Regional Board can amend the Basin Plan as needed. Such amendments need not coincide with the Triennial Review Process.

Basin Plan Amendments

Amending the Basin Plan involves the preparation of an amendment, an environmental checklist, and a staff report. Public workshops can be held to inform the public about planning issues before formal action is scheduled on the amendments. Following a public review period of at least 30 days, the Regional Board responds to public comments. Subsequently, the Regional Board can take action on the draft amendments at a public hearing.

The California Environmental Quality Act (as codified in the California Public Resources Code, §21080.5[d][2][i]) provides that the Secretary of Resources can exempt regulatory programs of state agencies from the requirements of preparing environmental impact reports, negative declarations, and initial studies should such programs be certified as "functionally equivalent." The Basin Planning process has been so certified. Accordingly, this amendment for the Basin Plan update (and accompanying documentation) is functionally equivalent to an environmental impact report or negative declaration.

Following adoption by the Regional Board, Basin Plan amendments and supporting documents are submitted to the State Board for review and approval. All Basin Plan amendments approved by the State Board after June 1, 1992 must also be reviewed and approved by the State Office of Administrative Law (OAL). All amendments take effect upon approval by the OAL. In addition, the USEPA must review and approve those Basin Plan amendments that involve changes in state standards to ensure such changes do not conflict with federal regulations.

The Region

Regional Setting

The Los Angeles Region (Figure 1-1) encompasses all coastal drainages flowing to the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente). In addition, the Region includes all coastal waters within three miles of the continental and island coastlines.

For planning purposes, the Regional Board uses the classification system developed by the California Department of Water Resources, which divides surface waters into hydrologic units, areas, and subareas (Figure 1-2) and ground waters into major groundwater basins (see ground water section). Figures 1-3 and 1-4 illustrate the major streams and lakes within the Region. As the eastern boundary, formed by the Los Angeles County line, departs somewhat from the hydrologic divide, the Los Angeles and Santa Ana Regions share jurisdiction over watersheds along their common border. The Regional Board is moving towards the use of Watershed Management Areas. Surface water watershed boundaries are illustrated on Figure 1-5.

Descriptions of the major hydrologic units follow:

- Pitas Point Hydrologic Unit, located in western Ventura County, extends from Rincon Point to the Ventura River. Numerous small canyons drain the southern slopes of the coastal hills in this area, which totals about 22 square miles. Limited supplies of ground water are present in alluvium along the bottoms of the canyons.

- Ventura River Hydrologic Unit includes parts of western Ventura County and a small part of eastern Santa Barbara County. The Ventura River drains the northern slopes of Sulphur Mountain and portions of the southern slopes of the Santa Ynez Mountains. The drainage area totals about 300 square miles and, except in coastal areas, land use is predominantly rural and open space. Small alluvial basins along the surface drainage system contain supplies of ground water.

- Santa Clara-Calleguas Hydrologic Unit covers most of Ventura County, part of northern Los Angeles County, and small parts of Santa Barbara and Kern Counties. With a drainage area of 1,760 square miles, it is the largest hydrologic unit in the Region. Most of the upland area is within the Angeles and Los Padres National Forests. While land use in the lower portion of the drainage area – in particular the Oxnard Plain – is predominantly agricultural, urban (primarily residential) land uses are encroaching upon and rapidly replacing these agricultural lands. The Santa Clara River and Calleguas Creek are the major streams in this area, draining the San Gabriel Mountains, Santa Susana Mountains, Oak Ridge, South Mountain, Simi Hills, Sawmill, Liebre and Frazier Mountains. Large reserves of ground water exist in alluvial aquifers underlying the Oxnard Plain and along the valleys of the Santa Clara River and its tributaries.

- Malibu Hydrologic Unit drains the southern slopes of the Santa Monica Mountains in western Los Angeles County and a small area of southeastern Ventura County. The drainage area totals 242 square miles and, except for the coastal area where land use is residential and commercial, most of the area is open space. No one stream dominates this drainage area rather, it is comprised of several small streams, including Topanga Canyon Creek, Malibu Creek, Dume Creek (Zuma Canyon Creek) and Big Sycamore Canyon Creek, which flow southward into the Pacific Ocean. Ground water is present in limited amounts in alluvium along the bottom of canyons and valleys and in fractured volcanic rocks.

- Los Angeles-San Gabriel Hydrologic Unit covers most of Los Angeles County and small areas of southeastern Ventura County. This drainage area totals 1,608 square miles. With most of

Regional Hydrologic Units, Areas and Subareas

401.00 PITAS POINT HYDROLOGIC UNIT

402.00 VENTURA RIVER HYDROLOGIC UNIT
402.10 Lower Ventura River HA
402.20 Upper Ventura River HA
402.30 Ojai HA
2.31 Upper Ojai HSA
2.32 Ojai Valley HSA

403.00 SANTA CLARA-CALLEGUAS HYDROLOGIC UNIT
403.10 Oxnard Plain HA
3.11 Oxnard HSA
3.12 Pleasant Valley HSA
403.20 Santa Paula HA
3.21 Sulfur Springs HSA
3.22 Sisar HSA
403.30 Sespe HA
3.31 Fillmore HSA
3.32 Topa Topa HSA
403.40 Piru HA
3.41 Santa Felicia HSA
3.42 Upper Piru HSA
3.43 Hungry Valley HSA
3.44 Stauffer HSA
403.50 Upper Santa Clara River HA
3.51 Eastern HSA
3.52 Bouquet HSA
3.53 Mint Canyon HSA
3.54 Sierra Pelona HSA
3.55 Acton HSA
403.60 Calleguas-Conejo HA

SANTA CLARA-CALLEGUAS HU (Continued)

3.61 West Las Posas HSA
3.62 East Las Posas HSA
3.63 Arroyo Santa Rosa HSA
3.64 Conejo Valley HSA
3.65 Tierra Rejada Valley HSA
3.66 Gillibrand HSA
3.67 Simi Valley HSA
3.68 Thousand Oaks HSA

404.00 MALIBU HYDROLOGIC UNIT
404.10 Topanga HA
4.11 Topanga Canyon HSA
4.12 Tuna Canyon HSA
4.13 Pena Canyon HSA
4.14 Piedra Gorda Canyon HSA
4.15 Las Flores Canyon HSA
4.16 Carbon Canyon HSA
404.20 Malibu Creek HA
4.21 Monte Nido HSA
4.22 Las Virgenes Canyon HSA
4.23 Lindero Canyon HSA
4.24 Triunfo Canyon HSA
4.25 Russell Valley HSA
4.26 Sherwood HSA
404.30 Point Dume HA
4.31 Corral Canyon HSA
4.32 Solstice Canyon HSA
4.33 Latigo Canyon HSA
4.34 Escondido Canyon HSA
4.35 Ramirez Canyon HSA

MALIBU HU (Continued)

4.36 Zuma Canyon HSA
4.37 Trancas Canyon HSA
404.40 Camarillo HA
4.41 Encinal Canyon HSA
4.42 Los Alisos Canyon HSA
4.43 Nicolas Canyon HSA
4.44 Arroyo Sequit HSA
4.45 Little Sycamore HSA
4.46 Deer Canyon HSA
4.47 Big Sycamore Canyon HSA
4.48 La Jolla Valley HSA

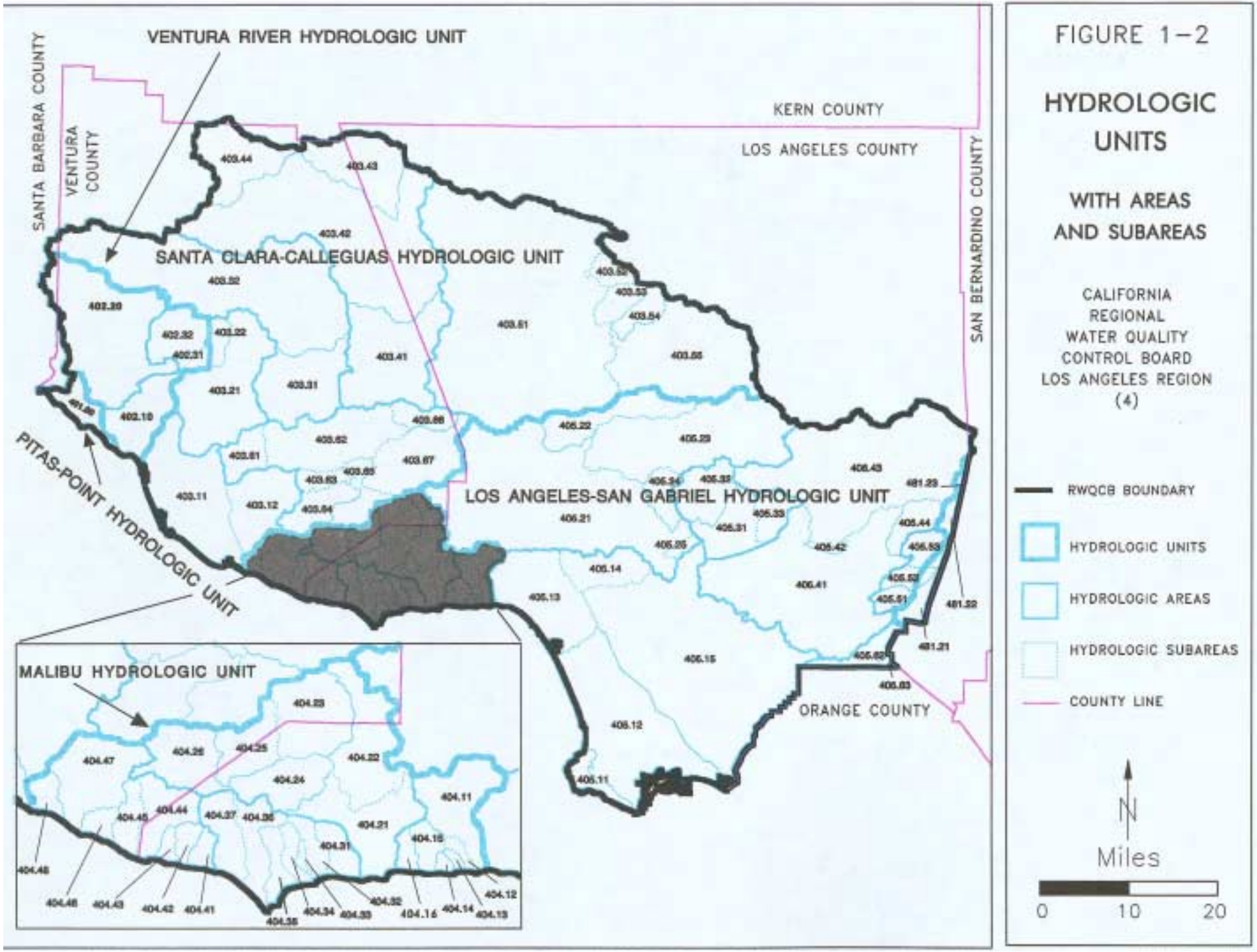
405.00 LOS ANGELES-SAN GABRIEL HYDROLOGIC UNIT
405.10 Coastal Plain HA
5.11 Palos Verdes HSA
5.12 West Coast HSA
5.13 Santa Monica HSA
5.14 Hollywood HSA
405.15 Central HSA Split
845.15 Central HSA Split
405.20 San Fernando HA
5.21 Bull Canyon HSA
5.22 Sylmar HSA
5.23 Tujunga HSA
5.24 Verdugo HSA
5.25 Eagle Rock HSA
405.30 Raymond HA
5.31 Pasadena HSA
5.32 Monk Hill HSA

LOS ANGELES-SAN GABRIEL HU (Continued)

5.33 Santa Anita HSA
405.40 San Gabriel Valley HA
5.41 Main San Gabriel HSA
5.42 Lower Canyon HSA
5.43 Upper Canyon HSA
5.44 Foothill HSA
405.50 Spadra HA
5.51 San Jose HSA
5.52 Pomona HSA
5.53 Live Oak HSA
405.60 Anaheim HA
845.61 Buena Park HSA
405.62 La Habra HSA Split
845.62 La Habra HSA Split
405.63 Yorba Linda HSA Split
845.63 Yorba Linda HSA Split

406.00 SAN PEDRO CHANNEL ISLANDS HYDROLOGIC UNIT
406.10 Anacapa Island HA
406.20 San Nicolas Island HA
406.30 Santa Barbara Island HA
406.40 Santa Catalina Island HA
406.50 San Clemente Island HA

801.00 SANTA ANA RIVER HYDROLOGIC UNIT
801.20 Middle Santa Ana River HA Split
481.20 Chino HSA Split
481.22 Harrison HSA
481.23 Claremont Heights HSA Split


VENTURA RIVER HYDROLOGIC UNIT
SANTA BARBARA COUNTY
VENTURA COUNTY
KERN COUNTY
LOS ANGELES COUNTY
SAN BERNARDINO COUNTY
SANTA CLARA-CALLEGUAS HYDROLOGIC UNIT
LOS ANGELES-SAN GABRIEL HYDROLOGIC UNIT
PITAS-POINT HYDROLOGIC UNIT
MALIBU HYDROLOGIC UNIT
ORANGE COUNTY
403.44
403.43
403.42
403.32
403.39
402.32
403.22
402.31
403.41
403.61
403.55
403.21
403.31
402.10
403.62
403.67
403.63
403.65
403.11
403.12
403.64
406.22
406.23
406.43
406.34
406.33
481.23
406.21
406.31
406.33
406.44
406.25
406.42
406.53
406.14
406.41
406.52
406.13
406.51
481.22
481.21
406.15
406.62
406.63
406.12
405.11
404.23
404.26
404.25
404.47
404.22
404.24
404.11
404.45
404.44
404.37
404.36
404.21
404.31
404.16
404.48
404.46
404.43
404.42
404.41
404.35
404.34
404.33
404.32
404.14
404.13
404.12
FIGURE 1-2
HYDROLOGIC UNITS
WITH AREAS AND SUBAREAS
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)
RWQCB BOUNDARY
HYDROLOGIC UNITS
HYDROLOGIC AREAS
HYDROLOGIC SUBAREAS
COUNTY LINE
N
Miles
0
10
20

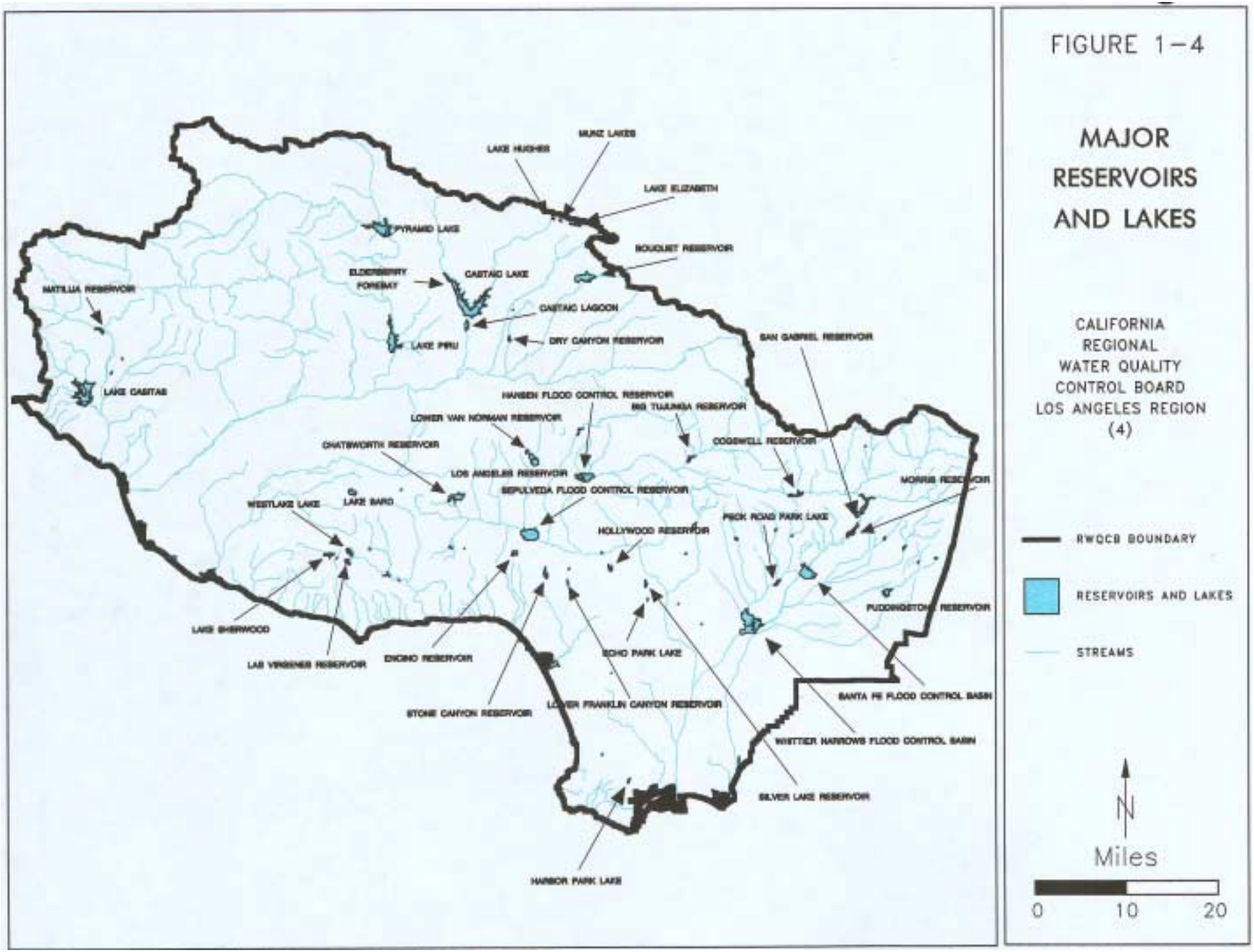
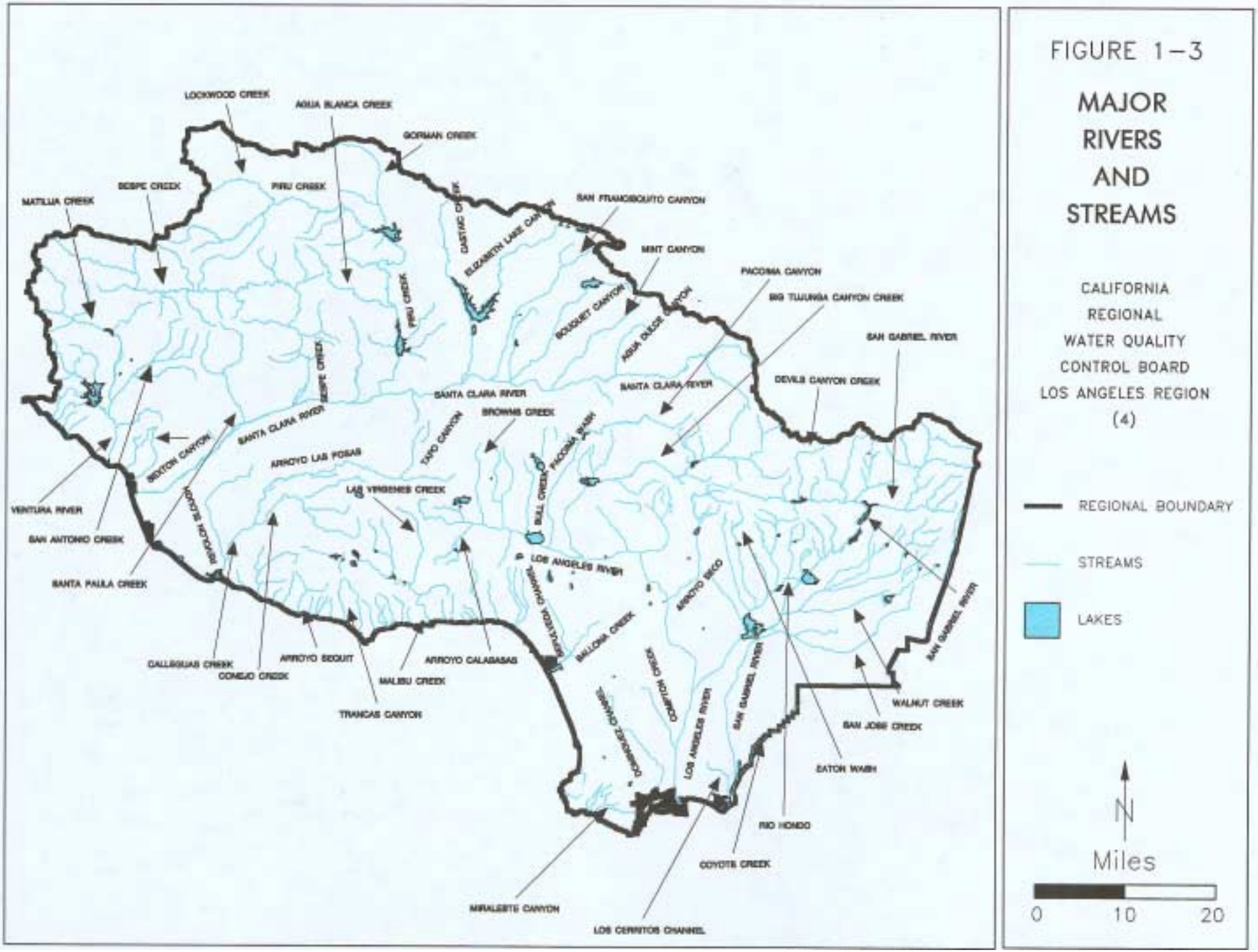


FIGURE 1-4
MAJOR RESERVOIRS AND LAKES
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)
RWQCB BOUNDARY
RESERVOIRS AND LAKES
STREAMS
N
Miles
0
10
20
MUNZ LAKES
LAKE HUGHES
LAKE ELIZABETH
PYRAMID LAKE
ELIZABETH FOREBAY
CASTAIC LAKE
CASTAIC LAGOON
LAKE PIRU
DRY CANYON RESERVOIR
BOUQUET RESERVOIR
PIRU RESERVOIR
LAKE CASITAS
SAN GABRIEL RESERVOIR
HANSEN FLOOD CONTROL RESERVOIR
BIG TUJUNGA RESERVOIR
LOWER VAN NORMAN RESERVOIR
CHATSWORTH RESERVOIR
COGSWELL RESERVOIR
LOS ANGELES RESERVOIR
SEPULVEDA FLOOD CONTROL RESERVOIR
MORRIS RESERVOIR
WESTLAKE LAKE
LAKE SHERWOOD
LAKE BARD
PECK ROAD PARK LAKE
HOLLYWOOD RESERVOIR
PUDDINGSTONE RESERVOIR
LAS VIRGENES RESERVOIR
ENCINO RESERVOIR
ECHO PARK LAKE
STONE CANYON RESERVOIR
LOWER FRANKLIN CANYON RESERVOIR
SANTA FE FLOOD CONTROL BASIN
WHITTIER NARROWS FLOOD CONTROL BASIN
SILVER LAKE RESERVOIR
HARBOR PARK LAKE


LOCKWOOD CREEK
AGUA BLANCA CREEK
GORMAN CREEK
SESPE CREEK
PIRU CREEK
MATILIJA CREEK
CASTAIC CREEK
ELIZABETH LAKE CANYON
SAN FRANCISQUITO CANYON
MINT CANYON
PACOIMA CANYON
BIG TUJUNGA CANYON CREEK
ROSASIET CANYON
ASUA DULCE CANYON
SAN GABRIEL RIVER
DEVILS CANYON CREEK
SANTA CLARA RIVER
BROWNS CREEK
SANTA CLARA RIVER
SESPE CREEK
PIRU CREEK
SANTA CLARA RIVER
SEXTON CANYON
TAPO CANYON
PACOIMA WASH
BELL CREEK
ARROYO LAS POSAS
LAS VIRGENES CREEK
VENTURA RIVER
SAN ANTONIO CREEK
SANTA PAULA CREEK
HONDO CANYON
LOS ANGELES RIVER
RIO HONDO CHANNEL
ARROYO SECO
BALLONA CREEK
CALLEGUAS CREEK
COMEJO CREEK
ARROYO SEQUIT
MALIBU CREEK
ARROYO CALABASAS
TRANCAS CANYON
COMPTON CREEK
LOS ANGELES RIVER
SAN GABRIEL RIVER
WALNUT CREEK
SAN JOSE CREEK
EATON WASH
RIO HONDO
COYOTE CREEK
MIRALESTE CANYON
LOS CERRITOS CHANNEL
FIGURE 1–3
MAJOR RIVERS AND STREAMS
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)
REGIONAL BOUNDARY
STREAMS
LAKES
N
Miles
0
10
20

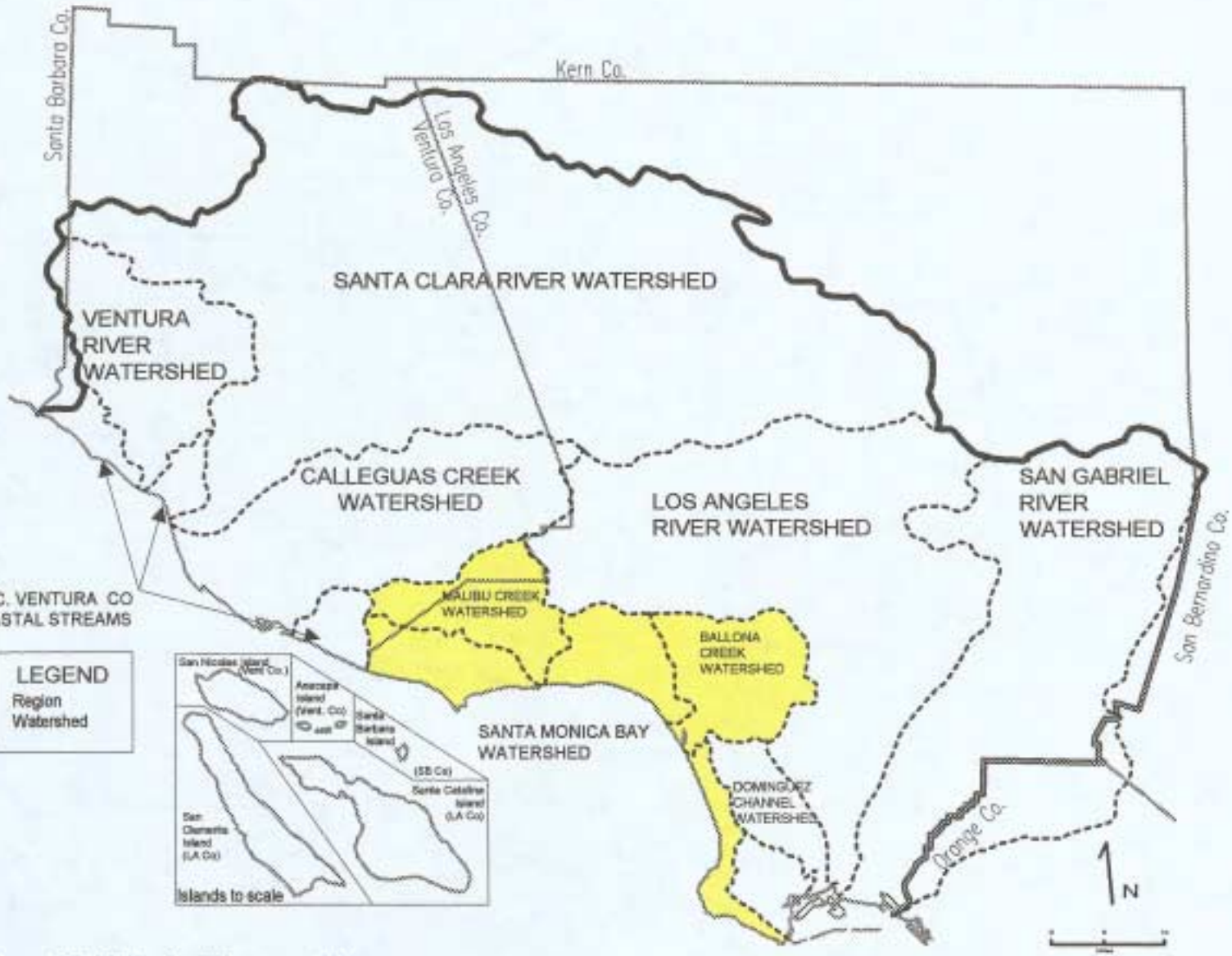


Figure 1-5. Watershed Managment Areas.

the population in the Region located in this hydrologic unit, land use is predominantly residential, commercial, and industrial; much of the area is covered with semi-permeable or non-permeable material (i.e., paved). The Los Angeles River, San Gabriel River, and Ballona Creek, which are the major drainage systems in this area, drain the coastal watersheds of the Transverse Ranges. These surface waters also recharge large reserves of ground water that exist in alluvial aquifers underlying the San Fernando and San Gabriel Valleys and the Los Angeles Coastal Plain.

- San Pedro Channel Islands Hydrologic Unit includes Santa Barbara, Santa Catalina, San Clemente, San Nicolas, and Anacapa Islands and Begg Rock. Except for limited development on Santa Catalina Island, land use of the Channel Islands is predominantly open space. Surface runoff on Santa Barbara Island does not flow in well-defined drainages; rather, surface runoff flows in sheets to the surrounding coastlines. Surface runoff on the other islands drains into intermittently-flowing creeks in small valleys and canyons. Reserves of ground water are limited on all of the islands.

Geology

Most of the Los Angeles Region lies within the western portion of the Transverse Ranges Geomorphic Province. The San Andreas transform fault system, forming the boundary between the North American and Pacific tectonic plates, cuts these western Transverse Ranges. This fault system, which extends northwesterly for over 700 miles from the Salton Sea in southern California to Cape Mendocino in northern California, bends in an east-west direction through the Transverse Ranges. Known as the "Big Bend," this portion of the San Andreas fault system formed from complex movements of the Pacific Plate against the North American Plate. Compression generated by such forces resulted in uplift of the Transverse Ranges, which have a conspicuous east-west trend (unlike other major ranges in the continental United States, which typically have a roughly north-south trend).

Major mountain ranges within the Los Angeles Region include: San Gabriel Mountains, Santa Monica Mountains, Santa Susana Mountains, Simi Hills, and Santa Ynez Mountains (Figure 1-6). The San Gabriel Mountains are the most prominent range in this group. The rock types exposed in the San Gabriel Mountains consist predominantly of Mesozoic granitic rocks (66 to 245 million years old), with minor exposures of Precambrian igneous and metamorphic rocks (prior to 570 million years old), and small stocks of Tertiary plutonic rocks (1.6 to 66 million years old). Cenozoic sedimentary beds (younger than 66 million years) are exposed only at the margins of the San Gabriel Mountains. Reflecting the recent and continuing uplift from plate tectonic activity, the San Gabriels are rugged mountains with deeply dissected canyons. Eroded sediments from these mountains have formed and are continuing to form prominent alluvial fans in the valleys along the flanks of the range.

During the Miocene Epoch (5 million to 23.5 million years ago), the sea advanced to the base of the San Gabriel Mountains, depositing fine-grained marine sediments. As the sea retreated, coarser-grained sediments, eroded from the Transverse Ranges, were deposited as alluvial fans in low-lying areas such as the San Fernando Valley, San Gabriel Valley, Oxnard Plain, and the Los Angeles Coastal Plain (Norris and Webb, 1991). These low-lying areas or basins are filled with layers of sediment. Many of these layers of sediment form aquifers that are important sources of ground water in the Region.

Climate

With prevailing winds from the west and northwest, moist air from the Pacific Ocean is carried inland in the Los Angeles Region until it is forced upward by the mountains. The resulting storms, common from November through March, are followed by dry periods during summer months. Differences in topography are responsible for large variations in temperature, humidity, precipitation, and cloud cover throughout the Region. The coastal plains and islands, with mild rainy winters and warm dry summers, are noted for their subtropical "mediterranean" climate. The inland slopes and basins of the Transverse Ranges, on the other hand, are characterized by more extreme temperatures and little precipitation.

Precipitation in the Region generally occurs as rainfall, although snowfall can occur at high elevations. Most precipitation occurs during just a few major storms. Annual rainfall in Ventura County averages 15.2 inches, although highs of almost 40 inches occur around Cobblestone Mountain and Pine Mountain, and lows of around 14 inches occur on the Oxnard Plain (Ventura County, 1993a).

Figure 1-6. Physiographic features of the Los Angeles Region.

Large variations also exist within Los Angeles County, as indicated by annual highs of around 42 inches at Mount Islip (along the crest of the Angeles National Forest) and annual lows of around 10 inches in the eastern Santa Clara River Valley. While an overall average is not available for Los Angeles County, annual rainfall at the Ducommun Street rain gauge in the City of Los Angeles averages 15.5 inches since measurements began in 1872 (Los Angeles County, 1993).

Land Use/Population

Land use within the Region varies considerably (Figure 1-7). In Ventura County, land uses are changing from agriculture and open space to urban residential and commercial. In southern Los Angeles County, the predominant land uses include urban residential, commercial and industrial. In northern Los Angeles County, open space is rapidly being transformed into residential communities.

The economy in Los Angeles County is primarily industrial, commercial, and service; while in Ventura County the economy is primarily agricultural, service, and commercial.

About 10 million people currently live in the Region. From 1950 to 1990 the population in the Region more than doubled. Figure 1-8 shows the increases in population in the Region since 1950, as well as projected population growth until the year 2015.

Natural Resources

Diversity in topography, soils, and microclimates of the Region supports a corresponding variety of plant and animal communities. Native vegetation in the Region can be categorized into several general plant communities: grasslands, sage-scrub, chaparral, oak woodland, riparian, pinyon-juniper, and timber-conifer. Within these general groups, many mixed subgroups and locally distinct vegetation types can be distinguished: mixed chaparral, semi-desert, and chamise chaparral, are a few examples.

Chaparral is the most common type of native vegetation in the Region. Large expanses of chaparral are found in the Santa Monica Mountains. Inland, coastal sagebrush occurs in the Simi Hills, Santa Susana Knolls, Verdugo Hills, and San Gabriel Mountains. Oak woodland, with the easily identifiable "Valley Oaks", sometimes reaching a height of 20 to 60 feet, is dominant in Thousand Oaks, Lake Casitas, Hidden Valley, Santa Clarita Valley, and elsewhere in the Transverse Mountain Ranges. Grasslands occur in Point Mugu State Park and on hillsides and valleys of northern Los Angeles County.

Riparian vegetation, found along most of the rivers and creeks, consists of sycamores, willows, cottonwoods, and alders. Extensive riparian corridors occur along Piru, Sespe, Santa Paula, Malibu, and Las Virgenes Creeks, Santa Clara, Ventura Rivers, and San Gabriel Rivers, as well as other rivers and creeks of the Los Padres and Angeles National Forests. The riparian vegetation provides essential habitat and transportation corridors for wildlife, supporting a great abundance and diversity of species.

The existence of "ecological islands" as a result of topography and climatic changes has led to the evolution of species, subspecies, and genetic strains of plants and animals in the Region. However, increasing urbanization and development have resulted in the loss of habitat and a decline in biological diversity. As a result, several native flora and fauna species have been listed as rare, endangered or threatened. Representative examples of endangered species include: California condor, American peregrine falcon, California least tern, tidewater goby, unarmored threespine stickleback, Mohave ground squirrel, conejo buckwheat, many-stemmed *Dudleya*, least Bell's vireo, and slender-horned spire flower.

Locally Unique Habitats

Habitats that support rare, threatened, endangered, or other sensitive plant or animal species are unique, not simply because they support these species, but because they are unique habitats in terms of their physical, geographical, and biological characteristics. Both Ventura and Los Angeles Counties have officially designated these unique areas as Significant Biological Resources or Significant Ecological Areas, respectively. These areas are described in detail in the counties' respective General Plans. The following two sections describe some of the more significant ecological areas recognized by Ventura and Los Angeles Counties as unique habitats.

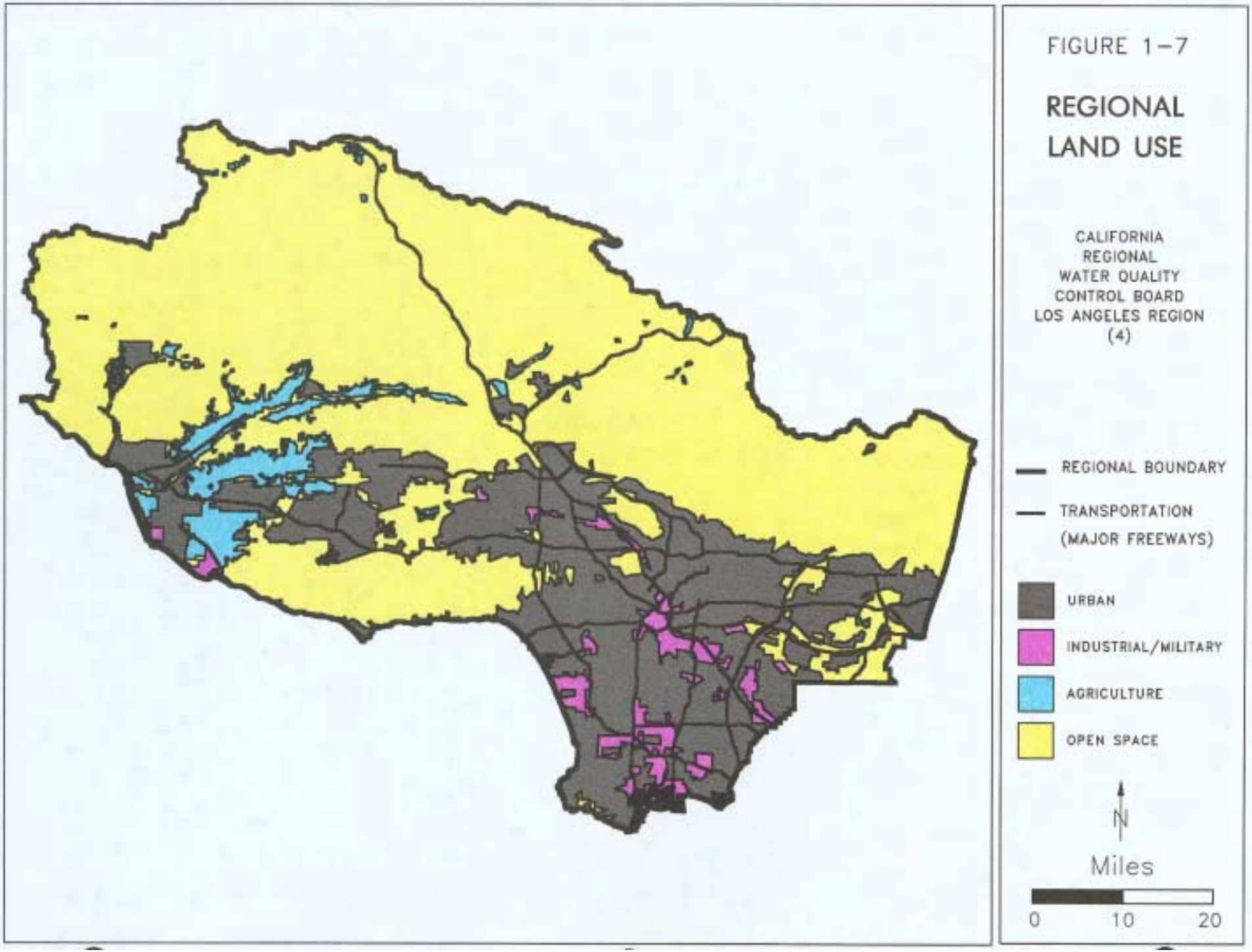
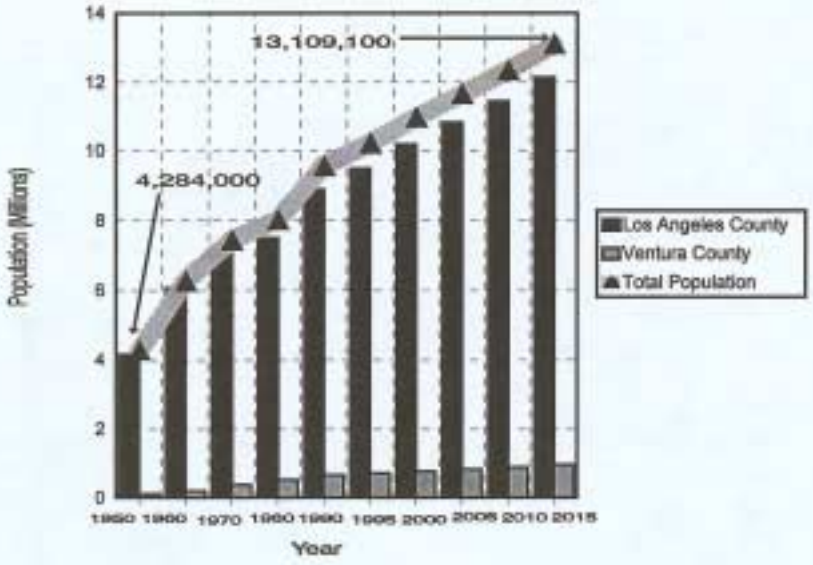


FIGURE 1-7
REGIONAL
LAND USE
CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)
REGIONAL BOUNDARY
TRANSPORTATION
(MAJOR FREEWAYS)
URBAN
INDUSTRIAL/MILITARY
AGRICULTURE
OPEN SPACE
N
Miles
0
10
20



Year	Los Angeles County	Ventura County	Total
1950	4,168,400	115,600	4,284,000
1960	6,071,900	203,100	6,275,000
1970	7,055,800	381,400	7,437,200
1980	7,500,300	532,200	8,032,500
1990	8,897,500	671,000	9,569,100
1995	9,489,600[p]	725,700[p]	10,215,300[p]
2000	10,180,900[p]	782,700[p]	10,963,600[p]
2005	10,812,900[p]	834,500[p]	11,647,400[p]
2010	11,441,900[p]	905,600[p]	12,347,500[p]
2015	12,137,600[p]	971,500[p]	13,109,100[p]

p = Projected Population

Source: California Department of Finance, June 1994

Figure 1-8. Population Projections in Los Angeles and Ventura Counties.

Ventura County

Many unique habitats, including coastal wetlands and lagoons, are found along the southern coast of Ventura County. These areas provide habitats for many fish, birds, invertebrates, sea lions, and for other marine and estuarine species. Mugu Lagoon is the most extensive wetland in the Region and supports a rich diversity of fish and wildlife (that once inhabited much of southern California's coastal areas). Other wetlands include McGrath Lake, Ormond Beach, and the estuaries at the mouths of the Ventura and Santa Clara Rivers. The "Pothole" in the Devil's Potrero (on Agua Blanca Creek) is an inland freshwater marsh that supports several species of plants unique to freshwater marshes.

One of the largest of Santa Clara River's tributaries, Sespe Creek, contains most of the Santa Clara River's remnant, but restorable, run of the steelhead trout. Sespe Creek is designated as a "Wild Trout Stream" by the State of California and supports significant steelhead spawning and rearing habitat. The steelhead trout is an "anadromous" fish (migrating from the ocean into fresh water for spawning). The federal Los Padres Wilderness Act (1992) permanently set aside portions of Sespe Creek for steelhead trout protection and designated Sespe Creek as a "Wild and Scenic River." Piru and Santa Paula Creeks, two other tributaries of the Santa Clara River, also support good habitats for steelhead. The Pacific lamprey, another anadromous fish, also uses Sespe Creek and the Santa Clara River for spawning. The Santa Clara River also has populations of unarmored three-spine stickleback. In addition, the Santa Clara River serves as an important wildlife corridor.

The Sespe Condor Sanctuary was dedicated in 1947 and consists of 53,000 acres in northern Ventura County. Due to problems with the condor recovery efforts, condors are now being released in Santa Barbara County.

Local populations of steelhead and rainbow trout have nearly been eliminated along the Ventura River. A limited resident population of rainbow trout occurs above Robles Diversion Dam, in San Antonio Creek, and in the lower Ventura River. Migratory steelhead ascend upstream in the Ventura River as far as Robles Diversion Dam and into San Antonio Creek. The California Department of Fish and Game and others, however, have recognized the potential for the restoration of the estuary and enhancement of steelhead populations in the Ventura River (Ventura County, 1991).

Los Angeles County

The County of Los Angeles has designated sixty Significant Ecological Areas (SEAs; Table 1-1) within the County in their general plan (Los Angeles County, 1976). Selected SEAs are described below.

Malibu Lagoon supports two important plant communities, the coastal salt marsh and coastal strand, and is an important refuge for migrating birds (over 200 species of birds have been observed). As Malibu Canyon dissects the Santa Monica Mountains, species normally restricted to the drier interior valleys have extended their range down the canyon. Perennial streams in Malibu Canyon support outstanding oak and riparian woodlands. Malibu Creek is also the southernmost watercourse in California where steelhead trout continue to spawn (for more information about the Malibu Creek watershed see Chapter 4, page 4-54.

The Tujunga Canyon/Hansen Dam area possesses several important features. The floodplain behind the dam supports some of the last examples of the open coastal sage-scrub vegetation in the Los Angeles area. A spreading ground (basin used for groundwater recharge) southwest of the dam has created several freshwater marsh areas that are used by migratory waterfowl and shore birds. The area is also valuable as a wildlife corridor.

The San Gabriel River watershed, totalling more than 136,000 acres, has extensive areas of undisturbed riparian and woodland habitats. The United States Congress has set aside approximately 36,215 acres of the West Fork San Gabriel River watershed as the "San Gabriel Wilderness Area." In addition, about 31,680 acres of the East Fork San Gabriel River watershed have been set aside as the "Sheep Mountain Wilderness Area." This watershed is also valuable to sportsmen, hikers, and picnickers.

San Francisquito Canyon, a tributary of the Santa Clara River, supports populations of Unarmored Three-spine Stickleback, an endangered fish species.

Table 1- 1. Significant Ecological Areas (SEAs) in Los Angeles County.[1]

No.	Significant Ecological Area (SEA)	No.	Significant Ecological Area (SEA)
1	Malibu Coastline	33	Terminal Island
2	Point Dume	34	Palos Verdes Peninsula Coastline
3	Zuma Canyon	35	Harbor Lake Regional Park
4	Upper Sierra Canyon	36	Madrona Marsh
5	Malibu Canyon and Lagoon	37	Griffith Park
6	Las Virgenes	38	Baldwin Hills[2]
7	Hepatic Gulch	39	Encino Reservoir
8	Malibu Creek State Park Buffer Area	40	Verdugo Mountains
9	Cold Creek	41	Rio Hondo Spreading Grounds[2]
10	Tuna Canyon	42	Whittier Narrows Dam County Recreation Area
11	Temescal--Rustic--Sullivan Canyons	43	Rio Hondo College Wildlife Sanctuary
12	Palo Comado Canyon	44	Sycamore and Turnbull Canyons
13	Chatsworth Reservoir	45	*Dudleya densiflora* Population
14	Simi Hills	46	Tujunga Spreading Grounds[2]
15	Tonner Canyon/Chino Hills	47*	Edwards Air Force Base
16	Buzzard Peak/San Jose Hills	48*	Big Rock Wash
17	Powder Canyon/Puente Hills	49*	Little Rock Wash
18	Way Hill	50*	Rosamond Lake
19	San Francisquito Canyon	51*	Saddleback Butte State Park
20	Santa Susana Mountains	52*	Alpine Butte
21	Santa Susana Pass	53*	Lovejoy Butte
22	Santa Fe Dam Floodplain	54*	Piute Butte
23	Santa Clara River	55*	Desert-Montane Transect
24	Tujunga Valley/Hansen Dam	56*	Ritter Ridge
25	San Dimas Canyon	57*	Fairmont and Antelope Buttes
26	San Antonio Canyon Mouth	58*	Portal Ridge/Liebre Mountain
27	Portuguese Bend Landslide	59*	Tehachapi Foothills
28	El Segundo Dunes	60*	Joshua Tree Woodland Habitat
29	Ballona Creek	61*	Kentucky Springs[2]
30	Alamitos Bay	62*	Galium grande Population
31	Rolling Hills Canyons	63	Lyon Canyon
32	Agua Amarga Canyon	64	Oak Savannah

1 Descriptions of these areas can be found in the Los Angeles County General Plan (1976)
2 These are also designated as open spaces.
* Outside of the Los Angeles Region

Water Resources/Water Quality Issues

Surface and ground waters within the Los Angeles Region have proven insufficient to support the rapidly growing population in the Los Angeles Region. Water imported from other areas now meets about 50% of fresh water demands in the Region. Restrictions on imported water as well as drought conditions have necessitated water conservation measures which, at present, are voluntary. These conservation measures have slightly lessened the use of potable water in many areas of the Region. In addition, the demand for water is being partially fulfilled by the increasing use of reclaimed water for non-potable purposes such as greenbelt irrigation and industrial processing and servicing.

Surface Waters

Major surface waters of the Los Angeles Region flow from head waters in pristine mountain areas (largely in two National Forests and the Santa Monica Mountains), through urbanized foothill and valley areas, high density residential and industrial coastal areas, and terminate at highly utilized recreational beaches and harbors. Uncontrolled pollutants from nonpoint sources are believed to be the greatest threats to rivers and streams within the Region.

- *Ventura River Watershed:* The Ventura River is the northern-most river system in southern California (south of Point Conception) that supports a large number of sensitive aquatic species, several of which are currently, or proposed to be, endangered or threatened. Water quality in the upper reaches is good but quality in the lower reaches is impacted by a combination of municipal water discharges and agricultural, urban and oil industry nonpoint sources.

- *Santa Clara River Watershed:* The Santa Clara River is the largest river system in southern California that remains in a relatively natural state. Extensive patches of high quality riparian habitat are present along the length of the river and its tributaries. Stream flows are diverted, usually during high flow, for "out-of-stream" beneficial uses. Threats to water quality include increasing development in floodplain areas, necessitating flood control measures such as channelization that results in increased flows, erosion, and loss of habitat.

- *Calleguas Creek Watershed:* Calleguas Creek drains a predominantly agricultural area on the Oxnard Plain and empties into Mugu Lagoon, one of southern California's few remaining large wetlands. While natural flows in the past were intermittent, discharges of municipal, agricultural, and urban wastewaters have increased surface flow in the watershed resulting in increased sedimentation in the lagoon. The general instability of the streambanks, continual destruction of riparian vegetation, and other land use practices have accelerated erosion in this watershed. Erosion problems are intensified in areas where residential development is occurring on steeply sloping upland areas. Should sedimentation continue at the present rate, the lagoon is projected to fill with sediment in about 50 years. Additional problems are produced by irrigation return-flows which add nutrients, pesticides, and other dissolved constituents to the creek and its tributaries.

- *Malibu Creek Watershed:* This watershed has changed rapidly in the last 20 years from a predominantly rural area to a steadily developing area that has doubled in population to nearly 80,000 residents. Increased flows (from imported waters needed to support the growing population base) and channelization of several tributaries to Malibu Creek have caused an imbalance in the natural flow regime in the watershed. Pollutants of concern, many of which are discharged from nonpoint sources, include excess nutrients, sediment, and bacteria.

- *Ballona Creek Watershed:* Pollutants from industrial and municipal effluent as well as urban runoff degrade the quality of Ballona Creek. Specific pollutants include high levels of dissolved solids (chlorides, sulfates, heavy metals) and bacteria. Untreated sewage overflows discharged into Ballona Creek during the rainy season cause beach closures along Santa Monica Bay. In addition, high concentrations of DDT in sediments at the mouth of the creek and in Marina Del Rey provide evidence of past discharges that have resulted in long-term water quality problems.

- *Los Angeles River Watershed:* The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers from the

1930s to the 1960s. One seven-mile reach in the narrows area (in the middle portion of the river system), where ground water rises into the streambed, is mostly unlined along the stream bottom and provides natural habitat for fish and other wildlife in an otherwise concrete conveyance. The upper reaches of the river carry urban runoff and flood flows from the San Fernando Valley. Below the Sepulveda Basin, flows are dominated by tertiary-treated effluent from several municipal wastewater treatment plants. Because the watershed is highly urbanized, urban runoff and illegal dumping are major contributors to impaired water quality in the Los Angeles River and tributaries.

- *San Gabriel River Watershed:* While the upper San Gabriel River and its tributaries remain in a relatively pristine state, intensive recreational use of this area for picnicking, off road vehicle use, fishing, and hiking threaten water quality and aquatic and riparian habitats. Further problems in the upper San Gabriel River occur as vast amounts of naturally eroding sediment from the rugged San Gabriel Mountains settle into reservoirs behind flood control dams. Improper sediment sluicing operations from these reservoirs can impact aquatic habitats and groundwater recharge areas. In the San Gabriel Valley, the middle reaches of the river have been extensively modified in order to control flood and debris flows and to recharge ground water. Extensive sand and gravel operations are found along these stretches of the river. The lower San Gabriel River (i.e., those stretches flowing through the Los Angeles Coastal Plain) also has been extensively modified and is lined with concrete from approximately Firestone Boulevard to the estuary. Flow in these lower reaches is dominated by effluent from several municipal wastewater treatment facilities and urban runoff. Beneficial uses have been impaired in these lower reaches of the San Gabriel River, as evidenced by ambient toxicity and bioaccumulation of metals in fish tissue.

Other more generalized surface water problems in the Region include:

- Poor mineral quality in some areas due to a variety of reasons including geology, agricultural runoff, discharge of highly mineralized ground water, and poor quality of some imported waters
- Bioaccumulation of toxic compounds in fish and other aquatic life
- Impacts from increased development and recreational uses
- In-stream toxicity from point and nonpoint sources
- Diversion of flows necessary for the propagation of fish and wildlife populations
- Channelization, dredging, and other losses of habitat
- Impacts from transient camps located along creeks and lagoons
- Illegal dumping
- Introduction of non-native plants which are of little value to the biota and clog the streams
- Impacts from sand and gravel mining operations
- Natural oil seeps
- Eutrophication and the accumulation of toxic pollutants in lakes

Ground Waters

Ground water accounts for most of the Region's local (i.e., non-imported) supply of fresh water. Major groundwater basins in the Region are shown in Figure 1-9.

The general quality of ground water in the Region has degraded substantially from background levels. Much of the degradation reflects land uses. For example, fertilizers and pesticides, typically used on agricultural lands, can degrade ground water when irrigation-return waters containing such substances seep into the subsurface. In areas that are unsewered, nitrogen and pathogenic bacteria from overloaded or improperly sited septic tanks can seep into ground water and result in health risks to those who rely on ground water for domestic supply. In areas with industrial or commercial activities, aboveground and underground storage tanks contain vast quantities of hazardous substances. Thousands of these tanks in the Region have leaked or are leaking, discharging petroleum fuels, solvents, and other hazardous substances into the subsurface. These leaks as well as otherdischarges

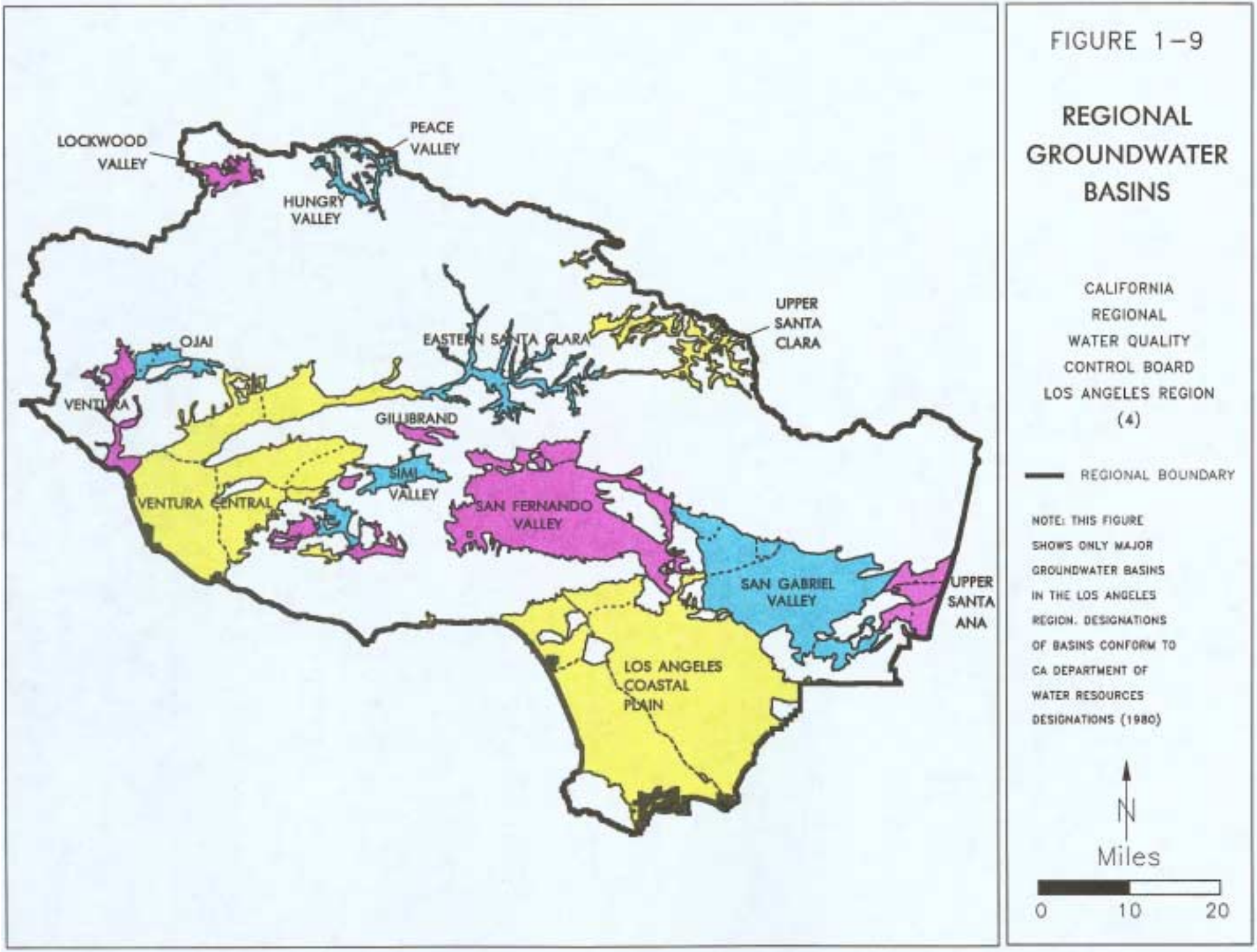


FIGURE 1-9

REGIONAL GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

NOTE: THIS FIGURE SHOWS ONLY MAJOR GROUNDWATER BASINS IN THE LOS ANGELES REGION. DESIGNATIONS OF BASINS CONFORM TO CA DEPARTMENT OF WATER RESOURCES DESIGNATIONS (1980)

N

Miles

0 10 20

to the subsurface that result from inadequate handling, storage, and disposal practices can seep into the subsurface and pollute ground water.

Compared to surface water pollution, investigations and remediation of polluted ground waters are often difficult, costly, and extremely slow.

Examples of specific groundwater quality problems include:

- San Gabriel Valley and San Fernando Valley Groundwater Basins: Volatile organic compounds from industry, and nitrates from subsurface sewage disposal and past agricultural activities, are the primary pollutants in much of the ground water throughout these basins. These deep alluvial basins do not have continuous effective confining layers above ground water and as a result pollutants have seeped through the upper sediments into the ground water. Approximately 20% of groundwater production capacity for municipal use in the San Gabriel Valley has been shut down due to this pollution.

  In light of the widespread pollution in both the San Gabriel Valley and San Fernando Valley Groundwater Basins, the California Department of Toxic Substances Control has designated large areas of these basins as high priority Hazardous Substances Cleanup sites. Furthermore, the USEPA has designated these areas as Superfund sites. The Regional Board and USEPA are overseeing investigations to further define the extent of pollution, identify the responsible parties, and begin remediation in these areas.

- Central and West Coast Groundwater Basins (Los Angeles Coastal Plain): Seawater intrusion that has occurred in these basins is now under control in most areas through an artificial recharge system consisting of spreading basins and injection wells that form fresh water barriers along the coast. Ground water in the lower aquifers of these basins is generally of good quality, but large plumes of saline water have been trapped behind the barrier of injection wells in the West Coast Basin, degrading significant volumes of ground water with high concentrations of chloride. Furthermore, the quality of ground water in parts of the upper aquifers of both basins is degraded by both organic and inorganic pollutants from a variety of sources, such as leaking tanks, leaking sewer lines, and illegal discharges. As the aquifers and confining layers in these alluvial basins are typically interfingered, the quality of ground water in the deeper production aquifers is threatened by migration of pollutants from the upper aquifers.

- Ventura Central Groundwater Basins: Despite efforts to artificially recharge ground water and to control levels of pumping, ground water in several of the Ventura Central basins has been, and continues to be, overdrafted (particularly in the Oxnard Plain and Pleasant Valley areas). Some of the aquifers in these basins are in hydraulic continuity with seawater; thus seawater is intruding further inland, degrading large volumes of ground water with high concentrations of chloride. In addition, nutrients and other dissolved constituents in irrigation return-flows are seeping into shallow aquifers and degrading ground water in these basins. Furthermore, degradation and cross-contamination are occurring as degraded or contaminated ground water travels between aquifers through abandoned and improperly sealed wells and corroded active wells.

  Unsewered areas of Ventura County, such as the El Rio area (to the northwest of Oxnard), represent another source of pollution to ground water in the Ventura Central Basins. In many wells in the El Rio area, nitrate is present in levels exceeding maximum contaminant levels (MCLs) established by the state and federal government (Ventura County, 1994).

- Acton Valley Groundwater Basin: Ground water is the source of most potable water in this unsewered area. However, increasing concentrations of nitrate are degrading the quality of this water. Investigations are underway to confirm septic tanks as the source of high levels of nitrate in this area.

Coastal Waters

Coastal waters in the Region include bays, harbors, estuaries, beaches, and open ocean. Santa Monica Bay dominates a large portion of the Region's open coastal waters. Deep-draft commercial harbors include the Los Angeles/Long Beach Harbor complex and Port Hueneme. Shallower, small craft harbors, such as Marina del Rey, King Harbor and Ventura Marina, occur at a number of locations.

Important estuaries are represented by coastal lagoons such as Mugu Lagoon and numerous small coastal wetlands such as Ballona Wetlands and Los Cerritos Wetlands. Recreational beaches occur along large stretches of the coastal waters.

These coastal waters are impacted by a variety of activities which include:

- Municipal and industrial wastewater discharges
- Cooling water discharges
- Nonpoint source runoff (urban and agricultural runoff in particular), including leaking septic systems, construction, and recreational activities
- Oil spills
- Vessel wastes
- Dredging
- Increased development and loss of habitat
- Offshore operations
- Illegal dumping
- Natural oil seeps

Imported Waters

Water from other areas has been imported into the Los Angeles Region since 1913, when the Los Angeles Aqueduct started delivering water from the Owens Valley. Since that time, southern California has developed complex systems of aqueducts to import water to support a rapidly growing population and economy. Water imported to the Region presently meets roughly half of the demand for potable water.

The principal systems (Figure 1-9) for importing water are summarized below:

- *The Los Angeles Aqueducts:* The City of Los Angeles, Department of Water and Power, diverts water from the Mono and Owens River Basins and transports this water via the 338-mile long Los Angeles Aqueducts to the City of Los Angeles. The original aqueduct was completed in 1913. A second aqueduct, which parallels the first, was completed in 1970.

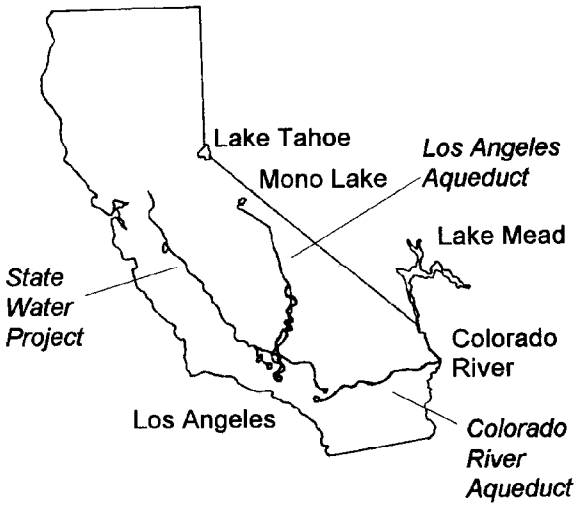


Figure 1-10. Sources of Imported Water in the Los Angeles Region (after Los Angeles Department of Water and Power, 1991).

Releases from the Haiwee Reservoir Complex, at the end of the Owens Valley Basin, supplied over 500,000 acre-feet per year to the City of Los Angeles during the first half of the 1980s. However, releases dropped to 127,012 acre-feet in 1990 as a result of the recent statewide drought, as well as legal restrictions on Mono Basin and Owens Valley water resources. Releases in 1992 totalled 173,945 acre-feet.

- *The California Aqueduct (The State Water Project):* The State of California, Department of Water Resources, transports about 2.4 million acre-feet per year of water, largely from the Feather and the Sacramento Rivers in northern California, to other parts of California via the California Aqueduct. In southern California, the aqueduct splits into east and west branches, terminating at Perris and Castaic Reservoirs, respectively. Approximately 1.4 million acre-feet per year of this water is delivered to four contractors for use within the Los Angeles Region: The Metropolitan Water District of Southern California (MWD), County of Ventura, Castaic Lake Water Agency, and San Gabriel Valley Municipal Water District.

- *The Colorado River Aqueduct:* The MWD imports water from Lake Havasu on the Colorado River through the 242-mile long Colorado River Aqueduct. This water is

transported to Lake Mathews, MWD's terminal reservoir, in Riverside County. While MWD held water rights for over 1.2 million acre-feet per year in the 1930s, MWD's dependable supply of Colorado River water has now been reduced to 450,000 acre-feet per year due to the exercise of water rights by other Colorado River water users. After blending with water delivered through the State Water Project, MWD delivers a portion of this water to its member agencies in the Los Angeles Region; the remaining water is delivered to other areas in southern California.

Water imported from the Owens Valley through the Los Angeles Aqueduct is usually treated for turbidity. Water from the Colorado River typically is harder than local supplies and other imported waters. This hardness is the result of dissolved constituents from soils and rocks in the Colorado River watershed. Water from northern California, while not as hard as Colorado River water, accumulates organic materials as it flows through the fertile Sacramento-San Joaquin Delta. These organic materials when combined with chlorine during typical disinfection treatment processes can result in by-products such as trihalomethanes (THMs). As THMs are linked to cancer, a 100 parts per billion standard has been established that mitigates the occurrence of THMs in drinking water while still allowing for adequate chlorine disinfection.

Water Supply and Drought Issues

During the most recent period of drought, water supplies from northern California often had higher than normal concentrations of chlorides which, in turn, often resulted in waste discharges that exceeded chloride limitations. To provide a measure of relief to dischargers who were unable to meet chloride limitations due to the drought and/or water conservation measures, the Regional Board adopted Resolution No. 90-04, entitled *Effects of Drought Induced Water Supply Changes and Water Conservation Measures on Compliance with Waste Discharge Requirements within the Los Angeles Region.* This policy, which was adopted on March 26, 1990, temporarily raised chloride limitations to match chloride increases in the water supply for a period of three years. Under this policy, chloride limitations were temporarily set at the lesser of (i) 250 mg/L or (ii) the supply concentration plus 85 mg/L.

Although the drought ended in 1993, water supplies in storage still contained higher than normal levels of chlorides. Accordingly, on June 14, 1993 the Regional Board extended these temporary chloride limitations for 18 months.

The Regional Board realizes that there may be a need for a longer term solution to these water supply issues, and will address these issues as part of the next Triennial Review.

Reclaimed Wastewaters

The State and Regional Boards recognize the shortage of fresh water in the Region and the need to conserve water for beneficial uses. Accordingly, reclaimed wastewaters are an increasingly important local resource. The State Board's *Policy with Respect to Water Reclamation in California* (State Board Resolution No. 77-1) is summarized and reprinted in Chapter 5. The importance of water reclamation is also recognized in Porter-Cologne. Sections 13575 to 13577, which were added in 1991 (during the fifth year of the last drought), set reclamation goals of 700,000 acre-feet per year and 1,000,000 acre-feet per year in the years 2000 and 2010, respectively.

The Regional Board supports reclamation projects (i.e., those projects that reuse treated wastewaters, thereby offsetting the use of fresh waters) through the Water Reclamation Requirements program. Under this program, discussed in detail in Chapter 4, treated wastewaters are reused for groundwater recharge, recreational impoundments, industrial processing and supply, and landscape irrigation.

In addition, the State and Regional Boards provide financial assistance to projects that are developing reclamation capabilities.

The Basin Plan

The following chapters designate beneficial uses of the Region's waters, water quality objectives for the protection of these beneficial uses, and a plan of implementation for enhancing or maintaining water quality. This information supersedes that in previously adopted Basin Plans and amendments.

Three overlays are located in appendix two of this Plan (hydrologic units, major freeways and USGS Quad Boundaries). These can be placed over any of the standard regional maps throughout this plan for orientation.