2.0 REGIONAL STUDY AREA

2.1 Regional Setting

2.1.1 Topography

The Los Angeles Region is located within the western portion of the Transverse Ranges Geomorphic Province. The San Andreas transform fault system, which forms the boundary between the North American and Pacific tectonic plates, cuts through these Transverse Ranges. This fault system, which extends from the Salton Sea in southern California to Cape Mendocino in northern California, bends in an east-west direction through the Transverse Ranges. The major mountain ranges within the Los Angeles Region include the San Gabriel Mountains, which are the most prominent range, the Santa Monica Mountains, the Santa Susana Mountains, Simi Hills and the Santa Ynez Mountains (RWQCB 1994).

The Los Angeles Region is divided into a coastal plain area, a central mountain-valley, and an eastern mountain-valley area. Figure 2-1 shows that a large southern portion of Los Angeles County is below 1000 feet. The middle section of the County is dominated by the San Gabriel Mountains with peaks rising about 10,000 feet. Ridgelines and boundaries of Watershed Management Areas are also shown in the figure and discussed later in the chapter.

2.1.2 Rainfall and Climate

Differences in topography are responsible for large variations in temperature, humidity and precipitation throughout the Los Angeles Region. The coastal climate is generally mild, whereas the inland slopes and basins of the Transverse Ranges are characterized by more extreme temperatures. Average temperatures decrease in the higher mountain areas.

Precipitation in the region occurs as rainfall, but snowfall can occur at higher elevations to the east. Precipitation generally increases with distance from the Pacific Ocean, from a yearly total of around twelve inches in coastal areas to around thirty inches in mountain areas to the east of the coastal plain (Figure 2-2).

Figure 2-3 shows monthly rain averages from three different areas: Long Beach (coastal plain), Downtown Los Angeles, and Mount Wilson (mountain area) based on decades of information from the California Department of Water Resources (Long Beach averages from 1941-2005; Los Angeles averages from 1996-2005; Mt. Wilson averages from 1982-2005).

On an annual basis, there are two distinct climatic periods: a dry (semi-arid) period from late April to mid-October, and a wet period from mid-October through late April.

For the coastal and inland areas, the wet period typically provides 85 to 90 percent of the annual average rainfall, with the remaining rainfall attributed to residual storms and occasional “summer monsoons.” The majority of the rain typically falls during February, which on average receives nearly eight inches of rainfall.

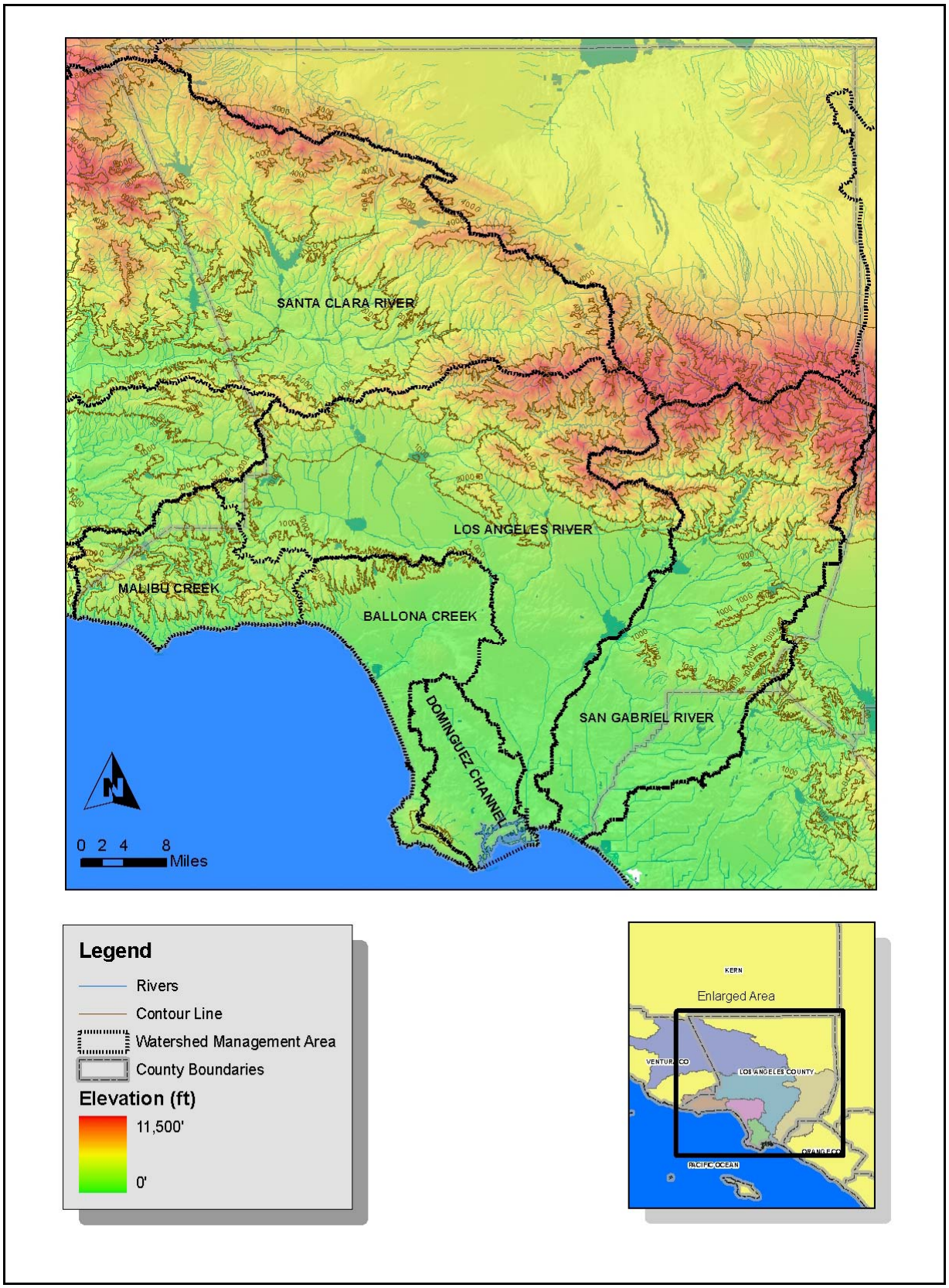

Figure 2-1. Topography.

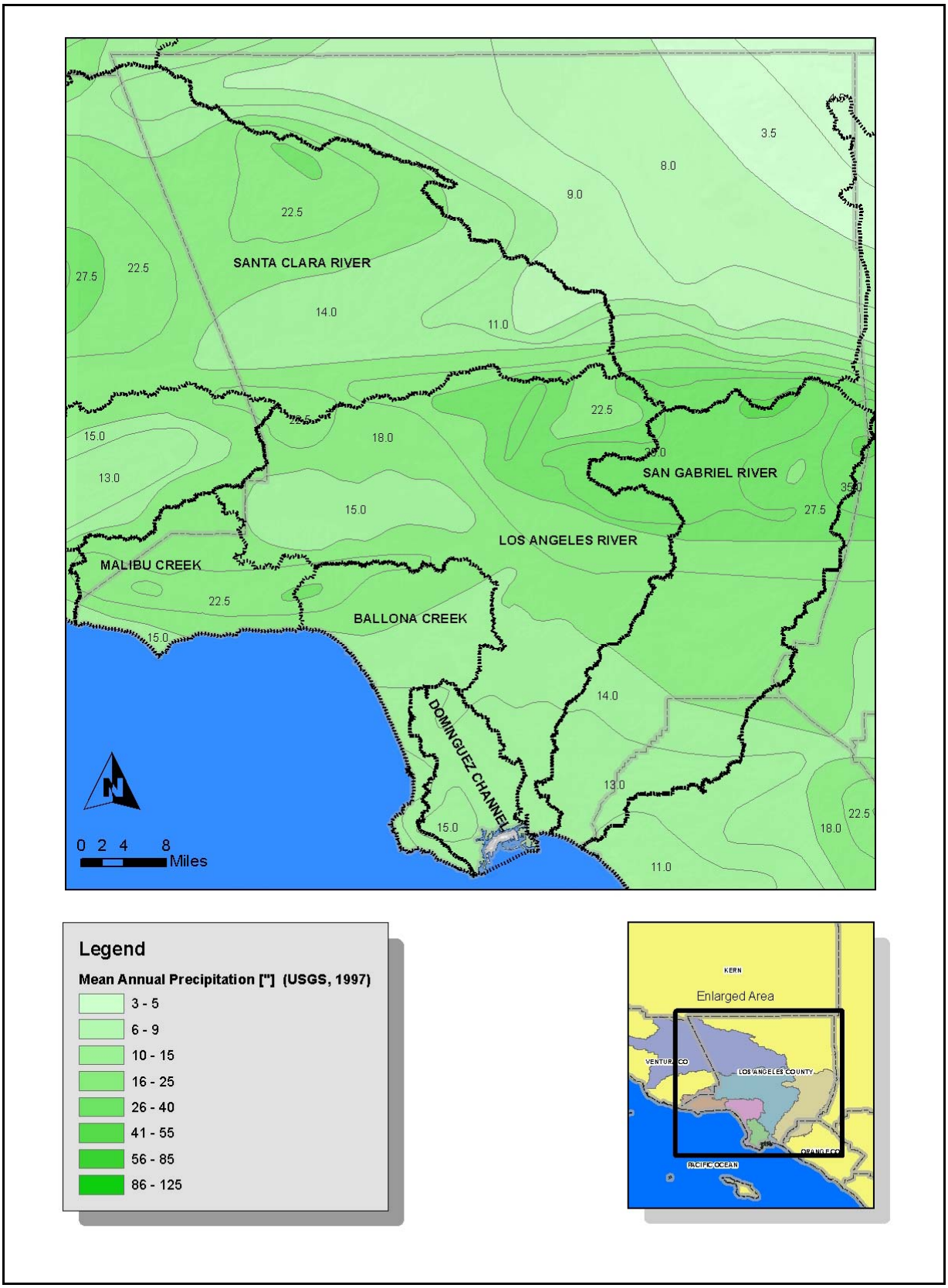

Figure 2-2. Annual Mean Precipitation.

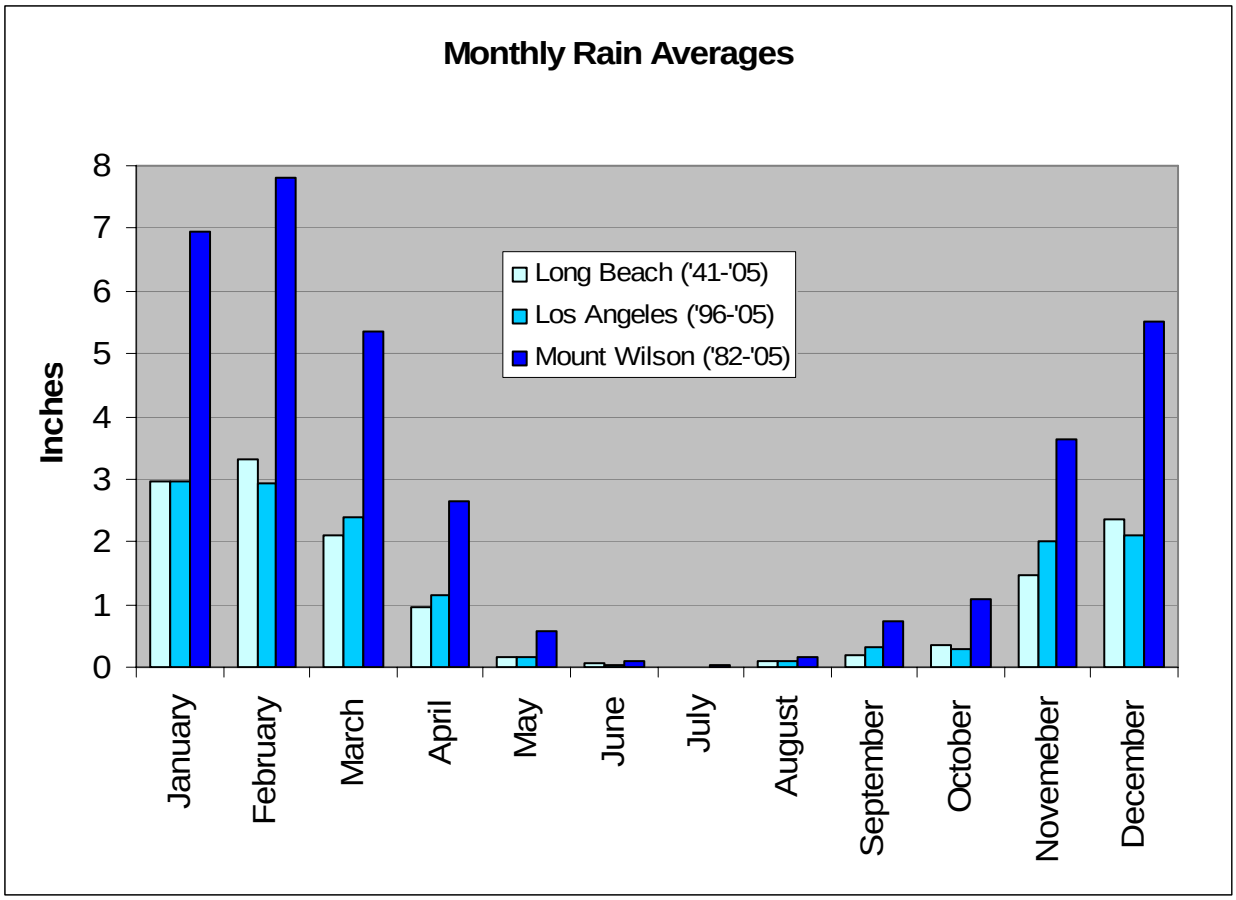

Figure 2-3. Monthly Rain Average.

The 2004/2005 storm season was not a typical year. The season total rainfall at the Los Angeles Department of Public Works Headquarters was about 43 inches which was much higher than the average 13 inches. Only the 1997/98 storm season had comparably high rainfall amounts in recent years (Figure 2-4).

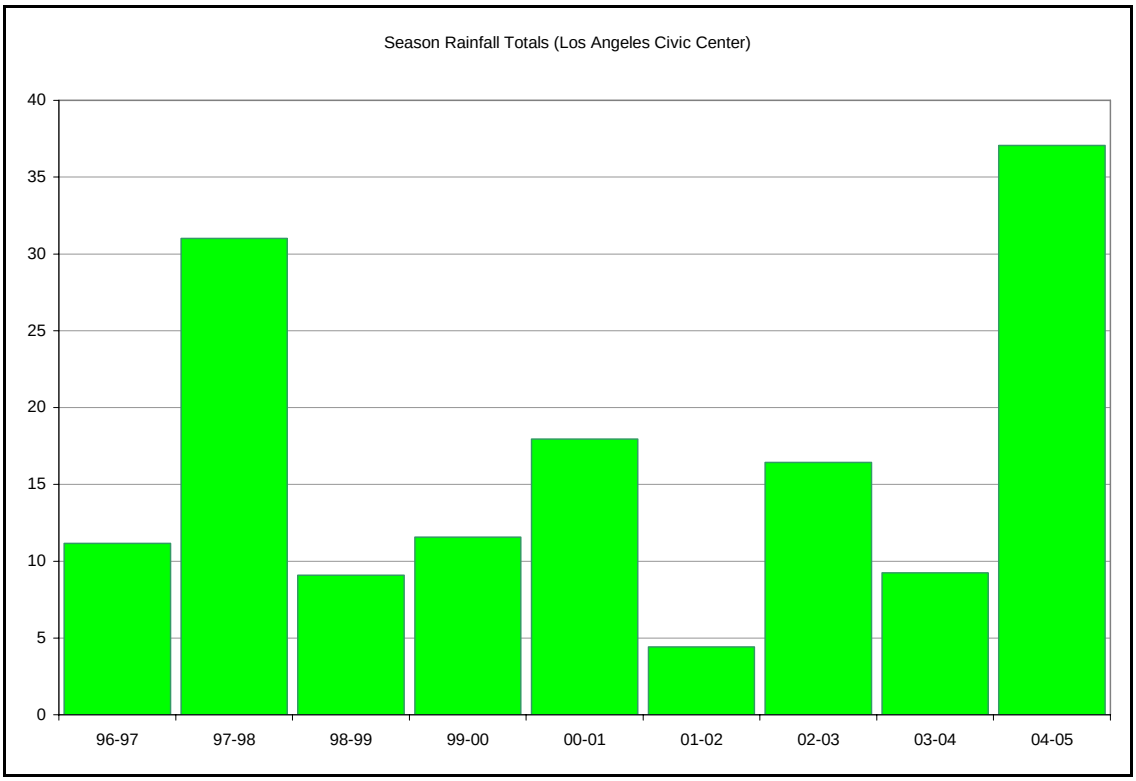

Figure 2-4. Seasonal Rainfall Totals.

2.1.3 Hydrology

The majority of Los Angeles County is contained within the Pacific Basin. The Los Angeles Region encompasses all coastal drainages flowing from the highlands in the east to the Pacific Ocean in the west (Figure 2-5). Major surface waters originate from pristine mountains, flow through urbanized foothill and valley areas, high density residential and industrial coastal areas, and terminate at highly utilized recreational beaches and harbors. Drainages in the northern and western part of the County flow through un-developed or developing areas. Alluvial fans in low-lying areas such as the San Fernando Valley, San Gabriel Valley, Oxnard Plain, and the Los Angeles Coastal Plain contain layers of sediment that form aquifers. The aquifers are important sources of ground water in the basin.

The Los Angeles Region is divided into nine watershed management areas (WMA), and contains all or portions of 4 major hydrologic units (HU), 13 hydrologic areas (HA), and 58 hydrologic subareas (HSA). The watershed management areas generally involve a single large watershed within which exists smaller subwatersheds but in some cases may be an area that does not meet the strict hydrologic definition of a watershed. The hydrologic divisions of the Region are assigned by the California Water Quality Control Board. This document will focus on the San Gabriel River, Los Angeles River, Dominguez Channel, Ballona Creek, Malibu Creek, and Santa Clara River Watershed Management Areas.

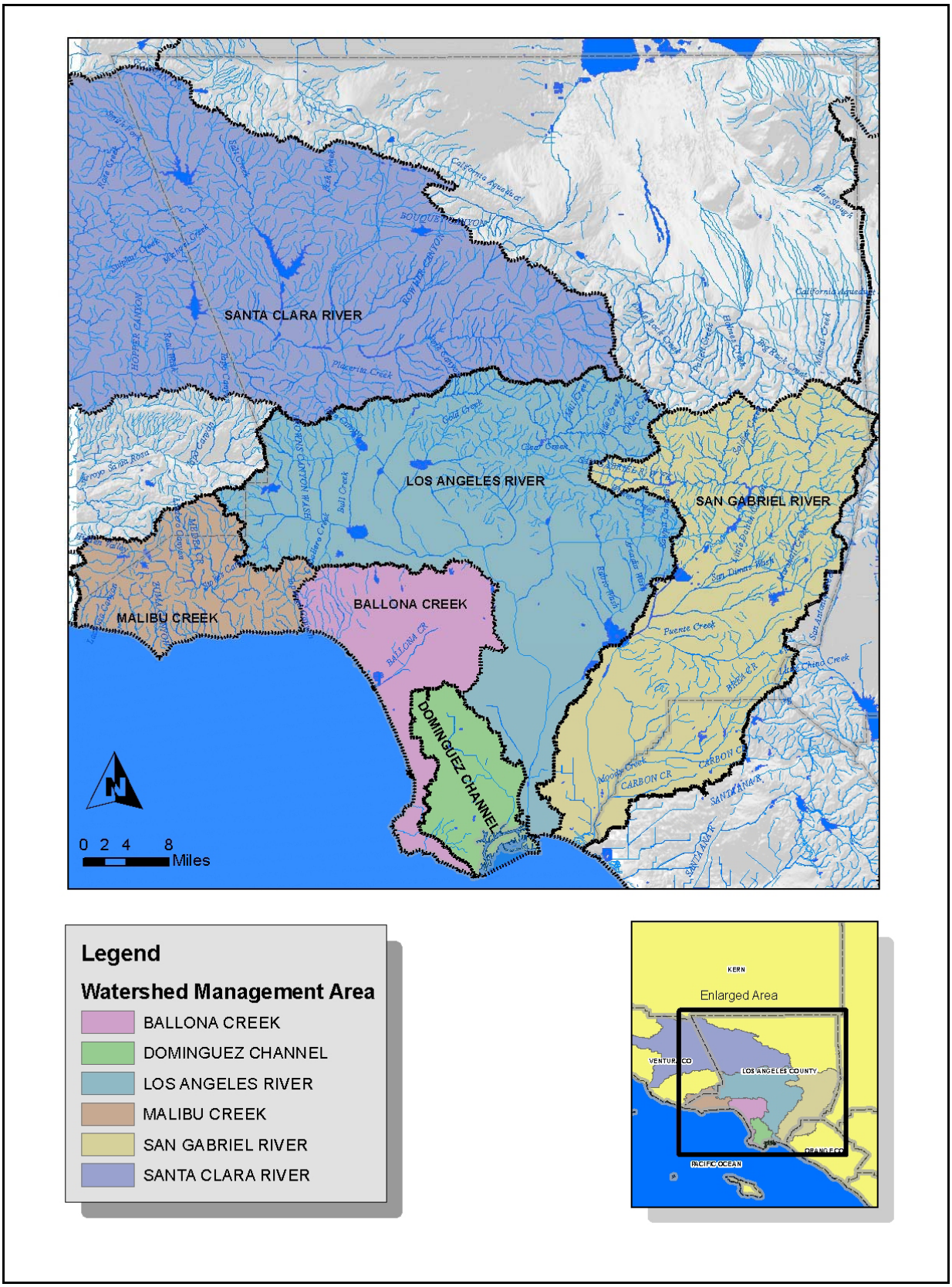

Figure 2-5. Hydrology in the Los Angeles Region.

Figure 2-6 shows water bodies that are listed on the State Water Resources Control Board (SWRCB) 2002 303(d) List for having impaired water quality. Many of the major rivers and channels in the southern, urbanized portion of Los Angeles County are included in the impaired listing.

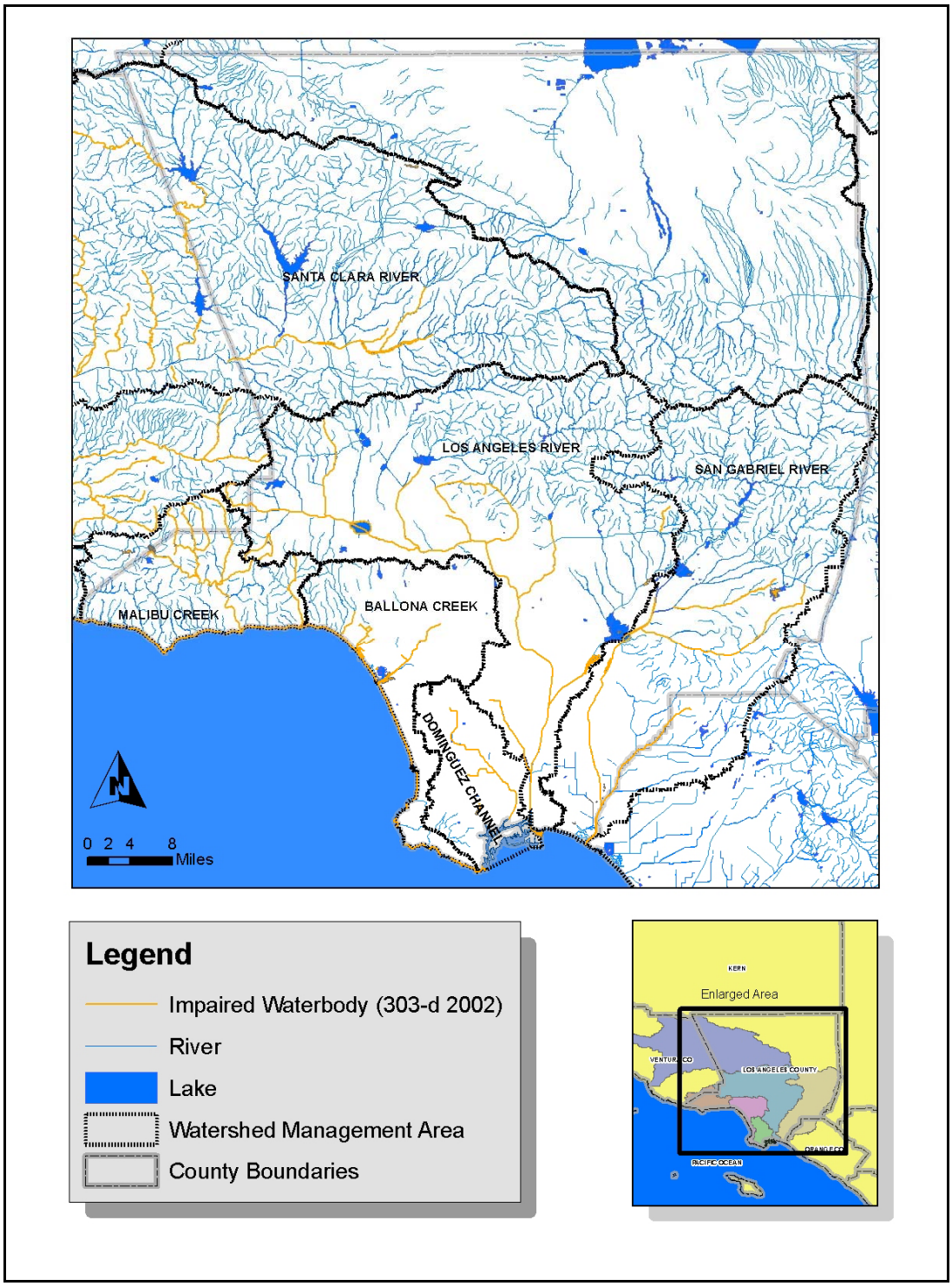

Figure 2-6. Impaired Water Bodies.

2.1.4 Population and Land Use

As of 2000, the population of Los Angeles County was concentrated in the southern watersheds of Santa Monica Bay, Los Angeles River, Dominguez Channel, and San Gabriel River (Figure 2-7). The highest density appears to be in the northeast portion of the Santa Monica Watershed within the City of Los Angeles. As of January 1, 2005, the population of Los Angeles County is estimated to be 10,226,506. This represents a 1.2% estimated population growth over the previous year (State of California 2005). The population is expected to grow to over 11,000,000 people by 2030 (Figure 2-8; State of California 2004).

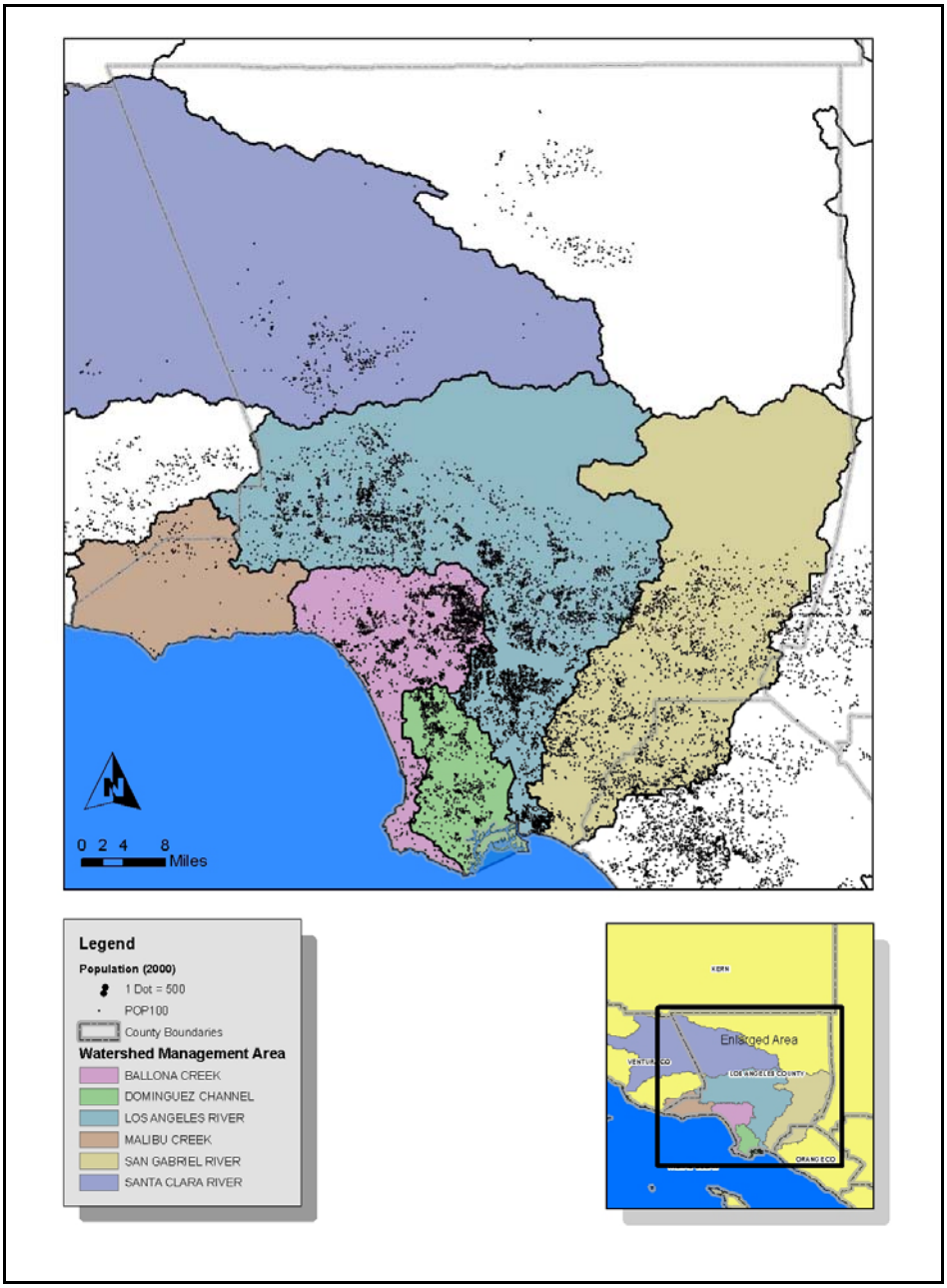

Figure 2-7. Population Density (2000).

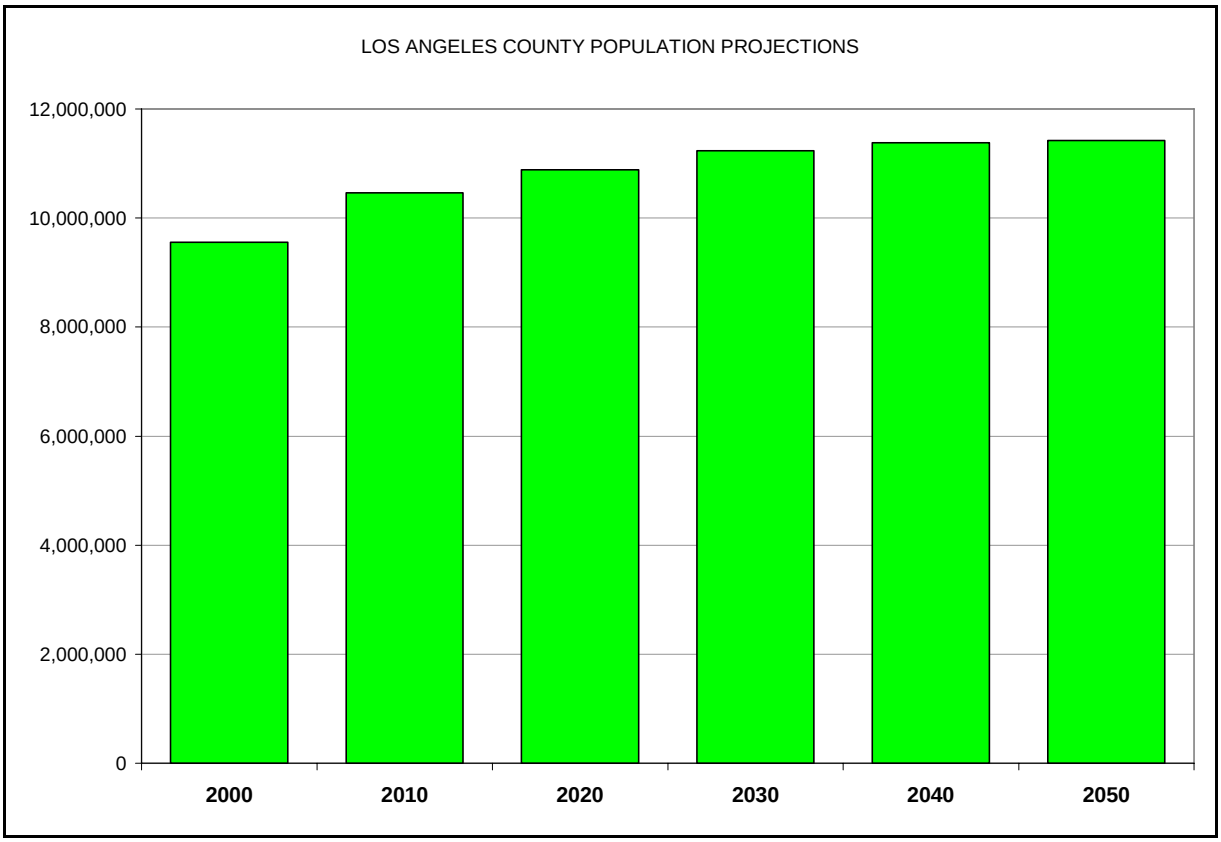

Figure 2-8. Los Angeles County Population Projections.

Land use within Los Angeles County varies considerably from vacant land to industrial (Figures 2-9 and 2-10). Overall land use in the County is dominated by undeveloped vacant land, which encompasses 64 % of the total land use. Residential areas comprise 19% of the total land use in the region, followed by commercial and public areas which comprise 6%. All other land use categories including agriculture, transportation and utilities, industrial, open space and water make up the remaining 11% of the County.

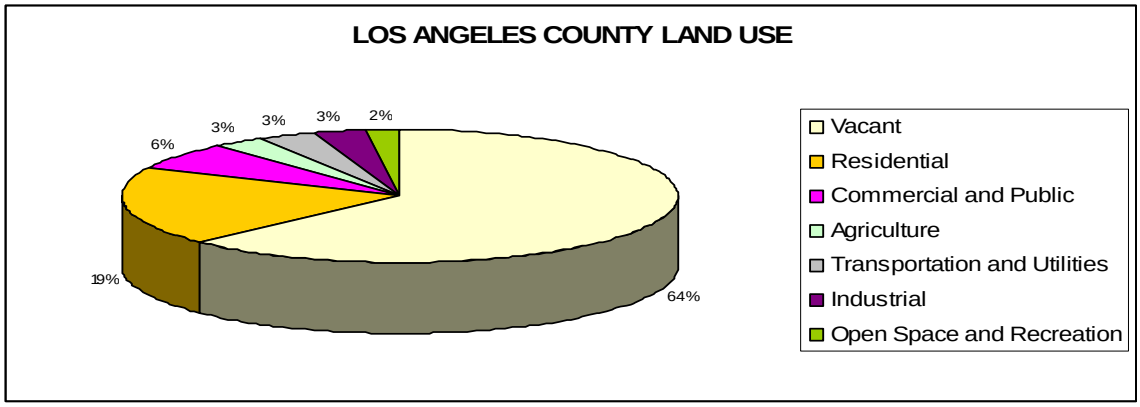

Figure 2-9. Los Angeles County Land Use (2000).

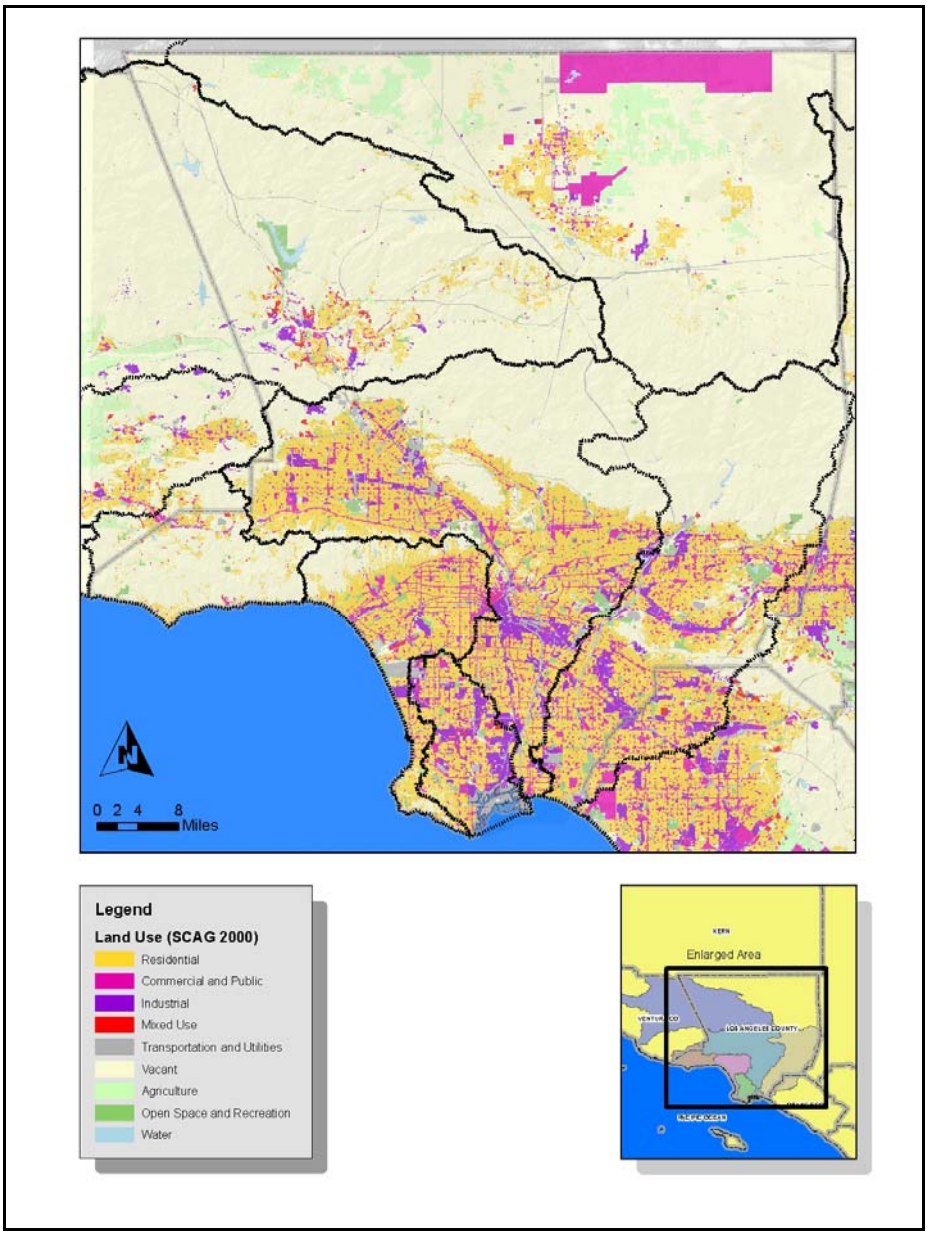

Figure 2-10. Land Use (2000).

Differences in Los Angeles County land use patterns can be seen by looking at individual watersheds. Figure 2-11 presents land use statistics for portions of the watersheds in Los Angeles County. Vacant land is the dominant land use in four of the watersheds, followed by residential land use. The Santa Clara River and Malibu Creek Watershed Management Areas contain the highest percentages of vacant land, with 87% and 82%, respectively. The San Gabriel River and Los Angeles River Watershed Management Areas contain 53% and 40% of vacant land, respectively. The Dominguez Channel and Ballona Creek watersheds are dominated by residential areas which comprise 41% and 53% of total land use area, respectively. Commercial and public land is the third most dominant land use in the majority of the watersheds.

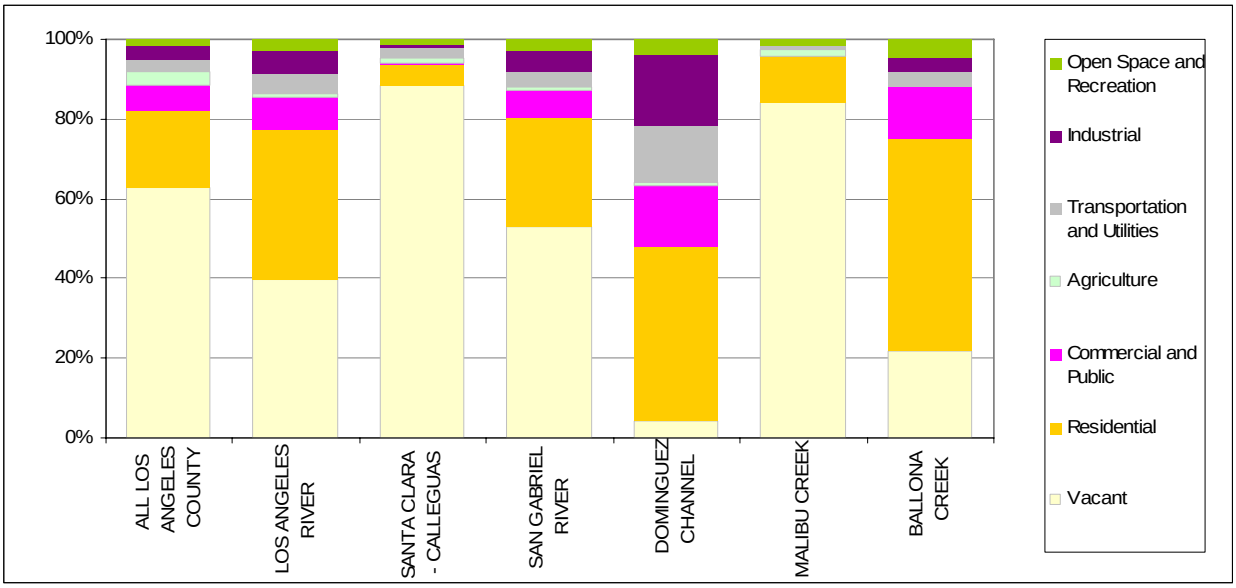

Figure 2-11. Los Angeles County Land Use Distribution by WMA.

2.2 Sampling Sites

To characterize the runoff quality in Los Angeles County, mass emission sites have been selected for monitoring. To evaluate the runoff quality of various subwatersheds, tributary sites were established in the Los Angeles River and Ballona Creek watersheds.

Monitoring site locations for the mass emission stations and tributary stations are shown in Figure 2-12.

There are seven mass emission stations, including Ballona Creek (S01), Malibu Creek (S02), Los Angeles River (S10), San Gabriel River (S14), Coyote Creek (S13), Dominguez Channel (S28), and Santa Clara River (S29).

The six tributary stations in 2002-2003 and 2003-2004 were located within the Los Angeles River Watershed and included Aliso Creek (TS01), Bull Creek (TS02), Burbank Western System Channel (TS03), Verdugo Wash (TS04), Arroyo Seco Channel (TS05), and Rio Hondo Channel (TS06). The 2004-2005 tributary stations were located in the Ballona Creek Watershed and include Centinela (TS07), Sepulveda (TS08), Benedict (TS09), Adams (TS10), Fairfax (TS11) and Cochran (TS12).

Mass emission and tributary station locations are described in each respective watershed management area (Sections 4-9).

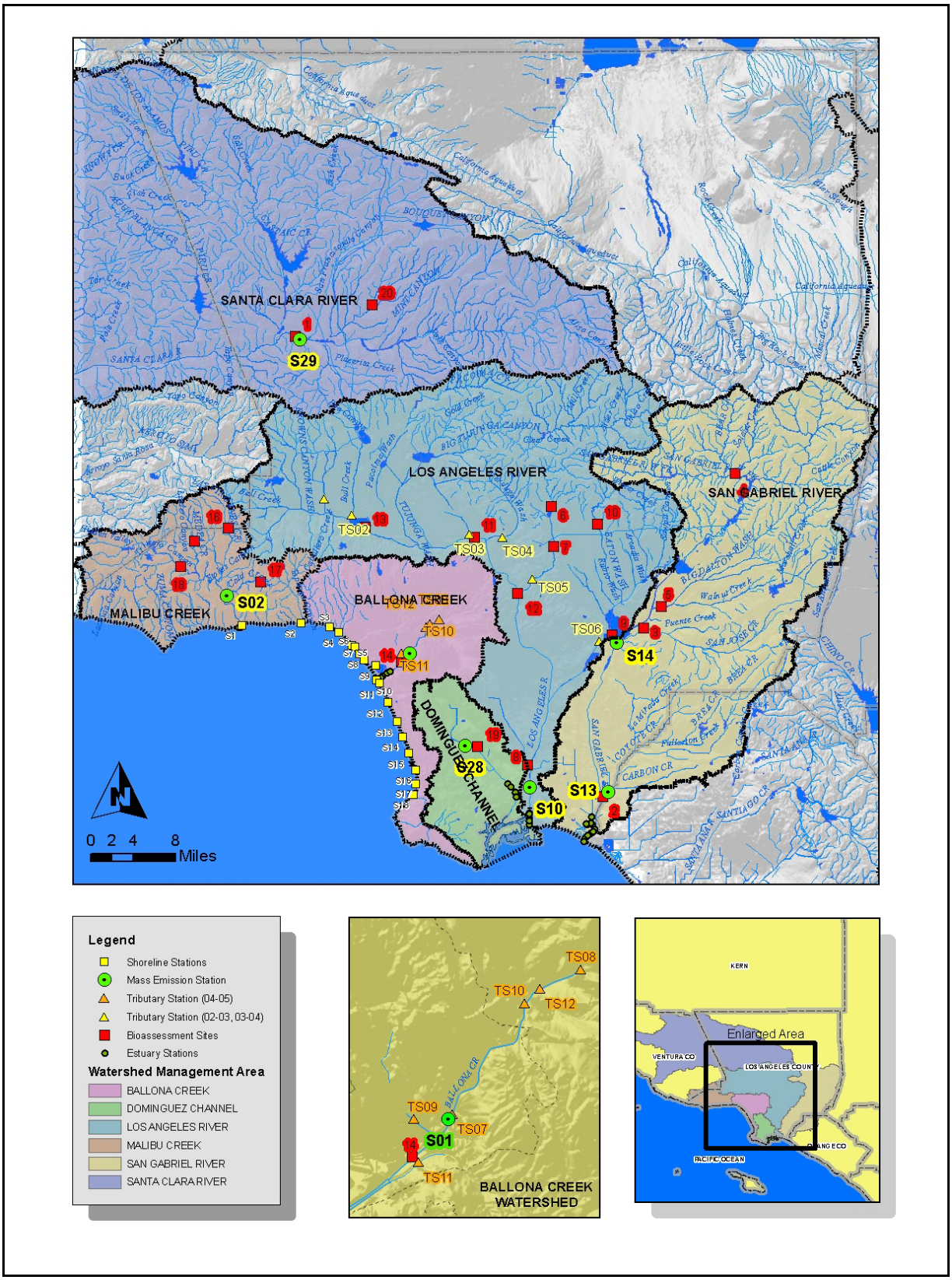

Figure 2-12. Monitoring Stations.

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