CHAPTER 2.0
SITE ASSESSMENT

2.1 LAND USE

This section outlines the changes in land use of the Calabasas area from historic time to the present. Various sources were used to develop this land use perspective, including aerial photographs and City resources.

2.1.1 Historic Land Use

For thousands of years Native Americans occupied the coastal California region. The Chumash is the first known tribe to inhabit the area now known as the City of Calabasas. In addition to the Chumash, the Gabrieleno/Tongva inhabited the area just south of Calabasas and then extended into the Los Angeles basin area. The mild climate and abundant flora and fauna in the area provided ample resources for hunting and gathering. Such resources enabled the Chumash to construct permanent villages, which were connected by established trails. Despite the permanence of their settlements, the Chumash lifestyle had a limited impact on the region (City of Calabasas 1994).

The Chumash had little contact with non-Native Americans until the 18th century, when the Spanish began exploring California. Spaniards such as Gaspar de Portola and Juan de Anza journeyed along the coast via trails established by Native Americans. Shortly after the arrival of such explorers, Spanish missionaries traveled into California to convert Native Americans to Christianity. They established 21 missions on the Californian coastline from San Diego to San Francisco. San Fernando Rey de España and San Gabriel Arcángel are the two closest missions to Calabasas and are both located in Los Angeles County. The missions forever changed the way of life for Native Americans in California. The missionaries introduced livestock, exotic plants, and roads.

El Camino Real, translated as "The Royal Highway," was the main artery for moving goods and information between the missions. Today Ventura Freeway (Highway 101) runs close to the original alignment of El Camino Real. With the establishment of more missions, travel along El Camino Real intensified. The increased road use, combined with agricultural settlements, escalated impacts on the land (California Missions 2002; Maslach 2000).

While the presence of the missions changed land use patterns and cultural traditions in California, it was the arrival of the Spanish-Mexican ranchers that began to significantly impact the land. At the beginning of the 19th century, the Mexican government granted large ranches in California to Mexican citizens. The new landowners brought intensive land uses to the area. To stake their land claim, the ranchers built permanent structures, planted crops, and introduced large herds of longhorn cattle. Furthermore, they established additional infrastructure to help communication and trade between settlers and missions.

Heavy grazing and clearing of trees for agriculture had a large impact on the native plants and trees. Native grasses could not compete with weeds and exotic plants brought by the Mexicans. Meadows were quickly established in grazing areas where live and valley oak once thrived (Maslach 2000).

Meanwhile, American homesteaders trying to stake their own claims in California moved into the Calabasas region in the mid-19th century. By the end of the century, Mexican and American ranches were broken into small farms. Soon, however, water ran low due to limited surface and well water in the area. Eventually this water shortage forced the ranchers to leave for more hospitable land.

The beginning of the 20th century brought new land uses to the Calabasas region. The area's proximity to the metropolis of Los Angeles made the mountainous region a desirable spot for recreation, filmmaking, and suburban residential development. The area began to grow substantially after 1958, in conjunction with the formation of the Las Virgenes Municipal Water District (LVMWD).

Las Virgenes Creek

Las Virgenes Creek is part of the Malibu Creek watershed. As shown in Figure 2.1, the creek begins in the undeveloped area of Ventura County and extends south to join Liberty Canyon Creek just north of Mulholland Highway. The area surrounding Las Virgenes Creek developed slowly during the 20th century. Due to the creation of Malibu Creek State Park (MCSP) and SMMNRA, much of the land is preserved in a natural state.

Las Virgenes Creek is an important area within the Malibu Creek watershed due to passing through MCSP and SMMNRA as it flows into Malibu Creek and eventually the Pacific Ocean. The area has long been desirable for filming and recreation and is deemed a significant national resource area protecting the rare Mediterranean ecosystem and our cultural heritage.

In the 1920s, the first residential subdivision in Calabasas was built in the mountains just east of Dry Canyon Creek. William Lingenbrick and C. Henry Taylor purchased 140 acres of land to

Source: Mountains Restoration Trust, 2002

500 0 500 1000 Feet

Scale: 1 : 6,000; 1 inch = 500 feet

Figure 2.1
Watershed Map
Las Virgenes Creek

recreational activities. By 1941, the club was closed and 20th Century Fox began to film movies on the land. In 1946, the studio decided to purchase the property. Numerous films and commercials were filmed in the dramatic scenery until the State of California bought the land in 1974. MSCP was established to restore and preserve the natural beauty of the area, opening to the public in 1976. Two years later, SMMNRA was established through combined efforts of public and private entities.

The area adjacent to the intersection of Ventura Freeway and Las Virgenes Road experienced little land use development until the 1940s. In the 1940s, the area south of the freeway was dotted with agriculture. This area continued to experience limited growth until the 1980s. North of Ventura Freeway, land development occurred earlier, with a few houses established in the 1940s. By the 1970s, the area was developed as a residential subdivision and, throughout the 1980s and 1990s, the area experienced heavy development up to the Ventura County jurisdictional line.

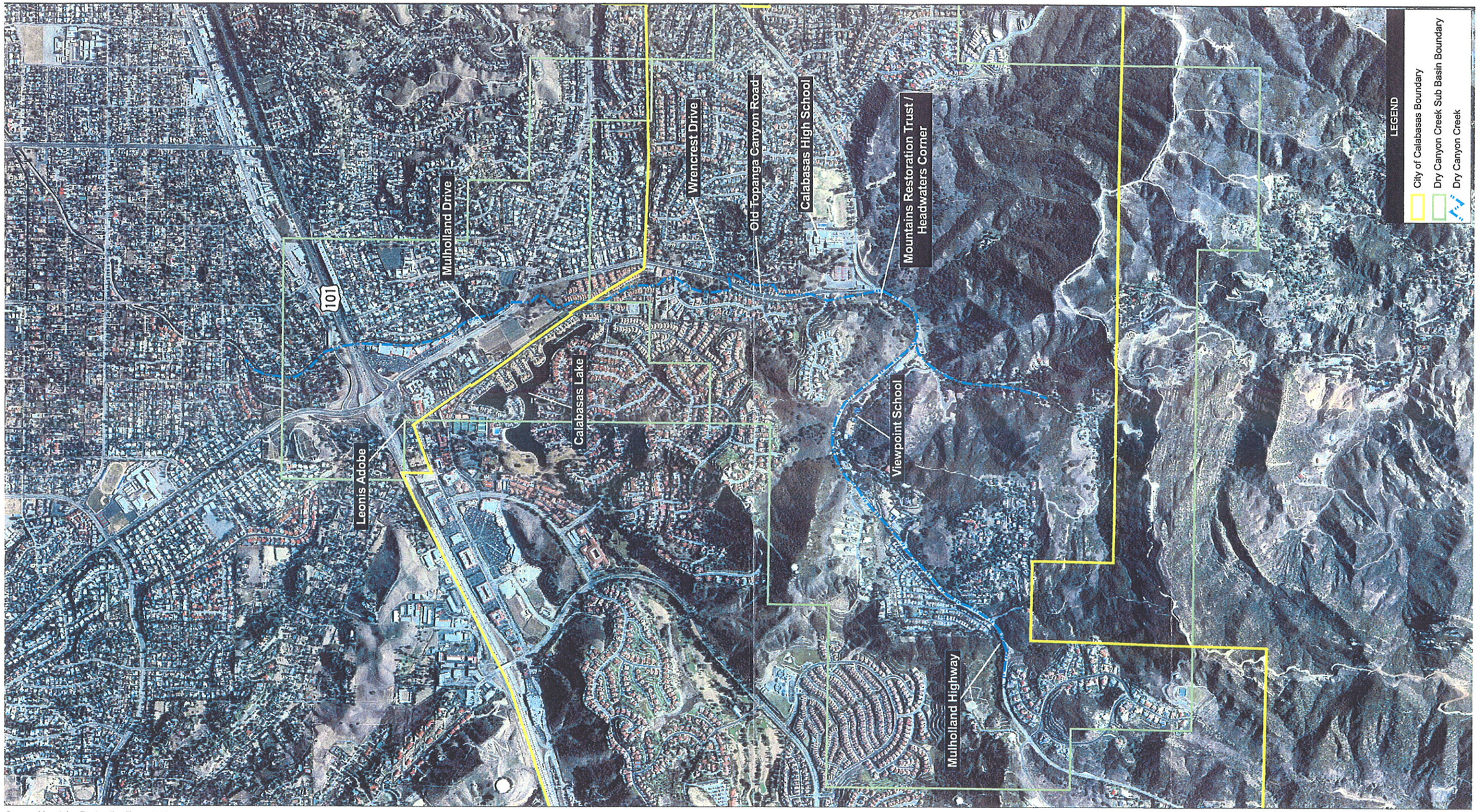
Today, Las Virgenes Canyon is a mix of open space and developed land. Most of the development is residential with limited commercial development near the Ventura Freeway. Unlike Dry Canyon or McCoy Creeks, most of Las Virgenes Creek flows in its natural state from the Simi Mountains to Malibu Creek.

Dry Canyon Creek

Dry Canyon Creek is part of the Los Angeles River watershed. As shown in Figure 2.2, Dry Canyon Creek begins in the Calabasas Highlands area, flows parallel to Mulholland Drive, then north along Old Topanga Canyon Road to the confluence with Calabasas Creek. Dry Canyon Creek and its surroundings have been highly impacted by large residential developments since the start of the 20th century although there are numerous patches of open space spotting the canyon. Dry Canyon Creek's tributary along Old Topanga Canyon Road maintains its rural character.

At the turn of the 20th century, most of the land surrounding the northern end of Dry Canyon Creek was agricultural. Harry Warner of Warner Brothers Pictures owned a large parcel on the eastern side of Calabasas. In 1921, he donated a portion of his estate to the newly founded Motion Picture and Television Fund (MPTF).

In the 1920s, the first residential subdivision in Calabasas was built in the mountains just east of Dry Canyon Creek. William Lingenbrick and C. Henry Taylor purchased 140 acres of land to build an artists' colony for the large number of movie directors, writers, sculptors, and architects in the region. In 1931, the development was named "Park Moderne." The area still exists today, located behind Calabasas High School.



Source: Mountains Restoration Trust, 2002

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Scale: 1 : 6,000; 1 inch = 500 feet

Figure 2.2
Watershed Map
Dry Canyon Creek

Even with the new development, the predominant land uses around Dry Canyon Creek continued to be agriculture and open space until post-World War II. After the war, Edison Company envisioned building a large residential development with the atmosphere of a country club. Calabasas Park was created from their vision. The first section was built near Dry Canyon Creek in the 1960s and included the creation of artificial Lake Calabasas.

The growth of large housing developments in Calabasas made it necessary to increase the number of roads in the area. New roads for the housing developments were built and, starting in 1955, Ventura Boulevard, which ran close to the original El Camino Real, was upgraded to become the Ventura Freeway (Highway 101).

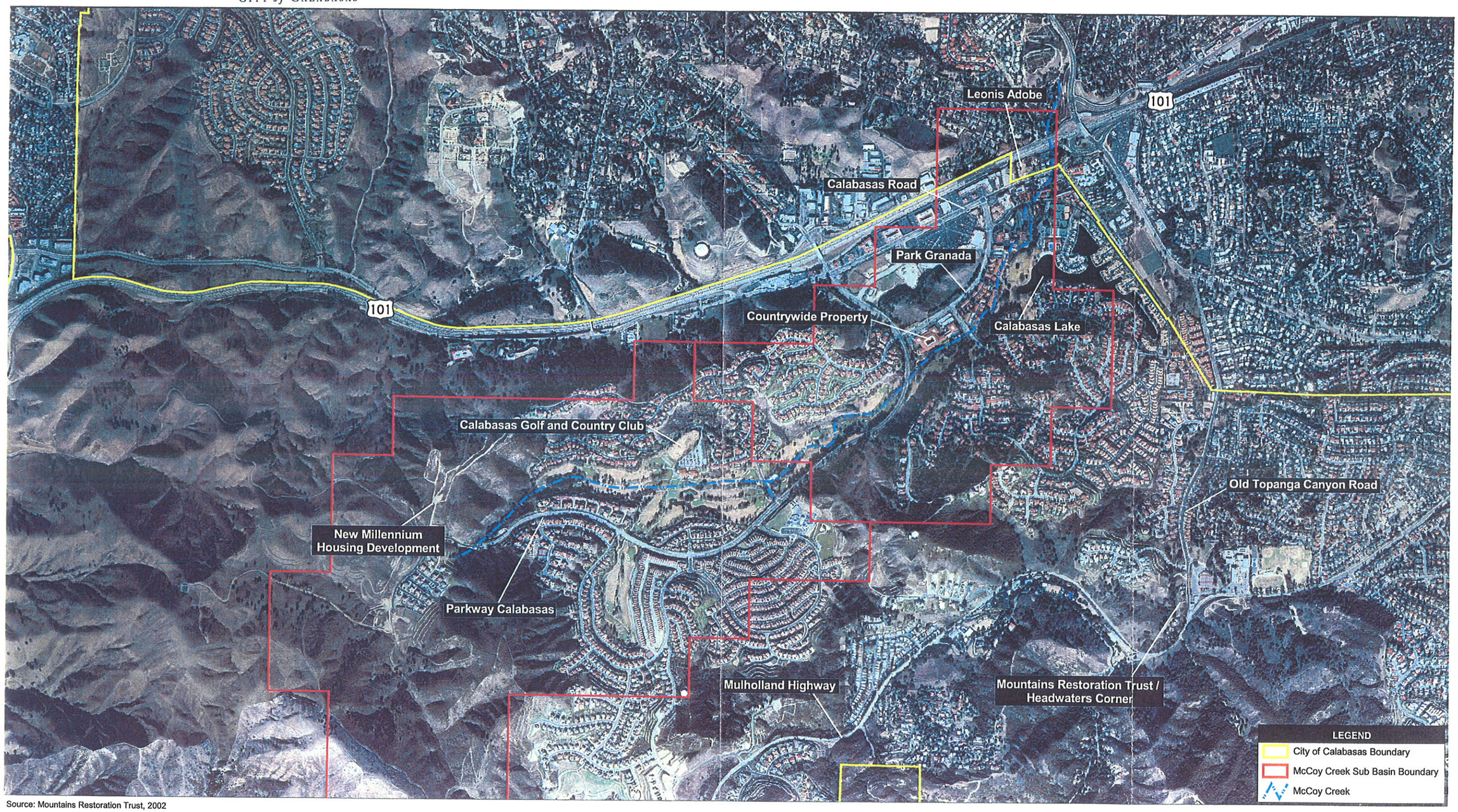
By the 1970s, agricultural land had mostly disappeared from east Calabasas. Moreover, the eastern region was considered fully built out by the late 1980s. Today Dry Canyon is suburban with a mix of multiple-family and single-family residences in the northern area and rural residential housing in the mountainous southern region. Due to roadway and residential development, most of Dry Canyon Creek runs through private property and in some areas in underground pipes.

McCoy Creek

McCoy Creek is also part of the Los Angeles River watershed. As shown in Figure 2.3, McCoy Creek flows from within the New Millennium housing development, parallel to Parkway Calabasas, continues in a northeast direction, past Calabasas Lake, past Leonis Adobe, and into the Calabasas Creek. McCoy Creek and the adjacent area were greatly impacted by large suburban housing developments after World War II. While most of the natural landscape has been altered, some of the cultural resources were saved from demolition and preserved.

The famous Leonis Adobe is located near the intersection of the Ventura Freeway and Mulholland Drive. The adobe was built in 1844, by an unknown person. Miguel Leonis and his wife Espiritu lived in the house together for 10 years until his death in 1889. Their son Juan Mendez inherited the ranch and adobe after Espiritu's death in 1906. Over the next 15 years, Mendez sold pieces of the ranch. He sold the last parcel in 1921.

From the 1920s to the end of World War II, McCoy Canyon was characterized by a few mountain homes and open space. With the creation of Calabasas Park in the 1960s, McCoy Canyon was forever changed. As part of its country club residential vision, Edison Company built a Tennis and Swim Club near the Leonis Adobe and continued residential build-out of McCoy Canyon. Near the top of the canyon, the Calabasas Golf and Country Club was built, surrounded by large rural residential houses.



Source: Mountains Restoration Trust, 2002

NORTH

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Scale: 1 : 6,000; 1 inch = 500 feet

Figure 2.3
Watershed Map
McCoy Creek

The creation of Calabasas Park increased development pressures in the Canyon. Leonis Adobe was almost demolished in the early 1960s, when Kathy Beachy purchased it in 1963. In 1975, Leonis Adobe was listed on the National Register of Historic Places. Preserving Leonis Adobe was the start of restoring Old Town Calabasas and its history. The Plummer House, once the oldest house in West Hollywood, was moved adjacent to the adobe in 1983. With the adobe saved and the addition and restoration of other historic buildings, the area opened as Old Town Calabasas in 1998 (Leonis 2002; City of Calabasas 1994).

Today, McCoy Canyon is characterized by gated, large, single-family homes and the golf course. Old Town is preserved and the Leonis Adobe and Plummer House are museums. Connecting Old Town to the residential areas of McCoy Canyon is Parkway Calabasas. It is a fully improved four-lane roadway, which follows adjacent to McCoy Creek. During the land development, McCoy Creek was rerouted down the mountains with sections now underground.

2.1.2 Current Land Use

Current land use within the City is outlined within the City's General Plan (Figure 2.4). As stated, the Calabasas General Plan is intended to be a "constitution" for local decision makers. The General Plan addresses immediate, mid-, and long-term issues concerning environmental sensitivity and preservation needs, public services, the economic vitality of the community, and environmental constraints. Land use and policy determinations can thus be made within a comprehensive framework that incorporates public health, safety, and "quality of life" considerations in a manner that recognizes the resource limitations and the fragility of the community's natural environment.

The Calabasas area has continued to develop from historic times to present. This continued development is represented by a decrease in open space and increase in the urban area within the study area (Table 2.1).

Table 2.1. Land Use Within the Study Area

Watershed	Open Space Area (acres)	Urban Area (acres)	Agricultural Area (acres)
Las Virgenes Creek	10,281	1,325	101
Dry Canyon Creek	2,082	909	0
McCoy Creek	1,339	383	0

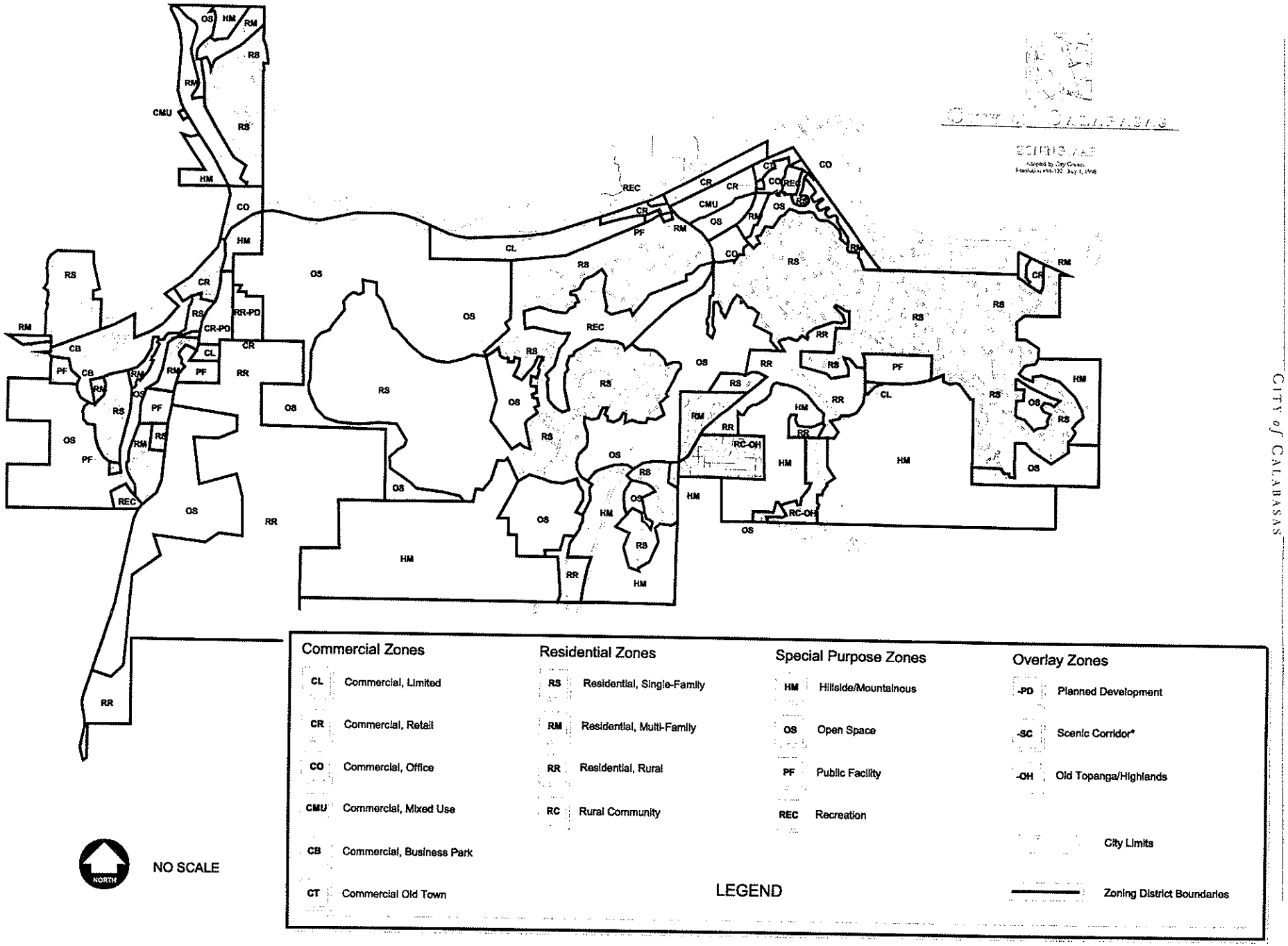

Figure 2.4

Current Land use Zoning Map

Las Virgenes Creek

Narrow stretches of land designated as Open Space (OS) are located along the eastern bank of Las Virgenes Creek near the northern City boundary and along the east side adjacent to Lost Hills Road continuing along both banks southeast toward Agoura Road. Both areas are positioned between various residential uses. In addition, much of the City's land to the east of, but not adjacent to, the southernmost reaches of Las Virgenes Creek is designated for OS use. The purpose of lands with this designation is to protect public health and safety, preserve sensitive environmental resources, or manage resources.

A small area southwest of the intersection of Lost Hills Road and Las Virgenes Road has been designated as Public Facilities (PF). This designation is assigned to land held by public agencies for the primary purpose of providing active and passive recreational opportunities. The land adjacent to Las Virgenes Creek is currently being used or is designated for residential, and commercial uses.

All lands located within 500 feet of Las Virgenes Road are within the viewshed designated by the Scenic Corridor overlay zone. All development and proposed land use within this zoning district require a special land use permit and must include elements that ensure enhancement and beautification of the scenic corridor.

According to City Public Works personnel all housing and commercial areas in the watershed are connected to a sanitary sewer system. The wastewater generated by these uses are pumped to and treated by the Las Virgenes Municipal Water District.

Dry Canyon Creek

Near the northern border of Calabasas, Dry Canyon Creek is flanked on each side primarily by residential uses. As the creek winds northeast along Mulholland Highway, it is bordered by a mix of residential uses and lands designated Hillside-Mountainous (HM). HM lands have a Maximum Land Use Intensity of one dwelling unit per 10 acres, or one dwelling unit per existing lot, whichever is greater. Because of physical constraints and safety issues on certain properties, some parcels cannot be built upon.

East and west of the intersection of Dry Canyon Cold Creek Road and Mulholland Highway, the north bank of the creek is adjacent to land designated as OS. Separated from this area by a small residential use is a second OS designation, which borders the creek for a short distance. The opposite bank of the creek in this area is bordered by HM lands.

All lands located within 500 feet of Mulholland Highway are within the Scenic Corridor overlay

zone. Within the viewshed, all development and proposed land use require a special land use permit and must include elements that ensure enhancement and beautification of the scenic corridor.

According to City Public Works personnel there is an unknown number of active septic systems, possibly approximately 50, within the watershed. There is no information currently available as far as location or condition of these systems. All other housing and commercial uses within the watershed are connected to the sanitary sewer system.

McCoy Creek

The area northwest of the golf course along McCoy Creek, designated as open space on the land use and zoning maps, is now undergoing major development based on the review of the aerial photograph. The development in this area is known as New Millennium development.

McCoy Creek is primarily surrounded by commercial and residential land designations. A long segment of the stream flows through lands designated as OS and occupied by a golf course. A small segment of the creek located near the northern City border is adjacent to the OS land designation that includes Lake Calabasas.

According to City Public Works personnel all housing and commercial areas in the watershed are connected to a sanitary sewer system. The wastewater generated by these uses are pumped to and treated by the Las Virgenes Municipal Water District.

2.1.3 Future Land Use

Future land use is difficult to determine at this time and will depend on the actions of the City Council as well as actions taken by adjoining jurisdictions. Land use is governed by the City General Plan; however, this plan can be changed, updated, and amended at different times to allow for changes in future land use. In the Las Virgenes Creek watershed, land use is not only governed by the City, but also by Ventura County, Los Angeles County, and the City of Agoura Hills. In the Dry Canyon and McCoy Creek watersheds, land use is governed by both Calabasas and the City of Los Angeles.

It can be expected that the area in and around Calabasas will continue to develop with the resulting increase in impervious area within the watersheds. This increase in impervious area will increase runoff quantity and velocity unless controls are mandated on all new development with the watersheds. However, all of the contributing municipalities are subject to NPDES Permit regulations and do impose strict urban storm water mitigation requirements on all new

developments. NPDES development planning regulations focus on minimizing impervious surfaces, implementing peak flow controls, and providing structural pollution prevention devices for filtration of storm water runoff from urban development.

2.2 BIOLOGY

Biological resources within the study area were compiled based on a site visits, and a review of existing environmental documentation for the region. Information reviewed included the California Natural Diversity Data Base (CNDDB) (CDFG 2003) as well as documents pertaining to Malibu Creek State Park, and the Santa Monica Mountains National Recreation Area. The most through information concerning biology in the study area is from studies conducted within Malibu Creek State Park. There was very little existing information specific to the Los Angeles River Watershed, therefore except where specifically noted the species can be expected to occur throughout the study area.

Plant Communities

Based on vegetation surveys of the area, as well as descriptions provided in R.F. Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California*, the plant life of the study area can be divided into six different plant communities, i.e., chaparral, oak woodland and valley oak savanna, riparian woodland, grassland, coastal sage scrub, and fresh water wetland. These plant communities are briefly described below. In addition, this section provides information on sensitive plant species that have the potential to occur within the study area.

Chaparral

The chaparral plant community covers much of the undisturbed hillside areas north of the Ventura – Los Angeles County line as well as limited areas within the study area. Chaparral consists of a variety of plants that thrive in poor, dry, sandy, rocky soils. In addition, the plant species associated with chaparral have evolved in a landscape that is subject to periodic fires, and hence have developed adaptations to fire that allow for their continued survival or reestablishment following fire. Heavy chaparral cover provides hillside stabilization thereby minimizing erosion, which in turn minimizes sedimentation loading into the creeks. Chaparral species in the study area include, but are not limited to, ceanothus (*Ceanothus* spp.), chamise (*Adenostema fasciculatum*), currant (*Ribes sp*), fuchsia-flowered gooseberry (*Ribes speciosum*), black sage (*Salvia mellifera*), purple sage (*Salvia leucophylla*), holly-leaf cherry (*Prunus ilicifolia*), holly-leaf redberry (*Rhamnus ilicifolia*), laurel sumac (*Malosma laurina*), mountain mahogany (*Cercocarpus betuloides*), poison oak (*Toxicodendron diversilobum*), scrub oak (*Quercus berberidifolia in Jepson*), sugar bush (*Rhus ovata*), and toyon (*Heteromeles arbutifolia*) (McAuley 1996b).

Oak Woodland and Valley Oak Savanna

The oak woodland plant community is dominated by coast live oaks (*Quercus agrifolia*). In some areas, thick oak woodland, which also includes elderberry (*Sambucus mexicana*), walnut (*Juglans californica*), laurel sumac, and several herbaceous plants, forms a forest environment. A number of small shrubs and animals live within the protective borders of the oak woodland. Oak woodland communities are considered sensitive because of their scarcity, limited range, and high wildlife value. Valley oaks (*Quercus lobata*) once covered large areas of flatlands forming open savannas, but now only a few isolated stands remain. The valley oak is the largest native oak, and grows in fertile soils. The valley oak woodlands just south of the study area in Malibu Creek State Park, define the southernmost extent of this species' range. This range also extends east into the Dry Canyon Creek watershed. However, within the Dry Canyon Creek watershed the valley oak woodland has been disturbed by increased development in the area.

Riparian Woodland

Riparian communities are situated along stream courses and adjacent stream banks. Most riparian species are restricted to areas of a high water table (e.g., drainages), and require moist, bare mineral soils for germination and establishment, much like the conditions following periodic flooding (Holland 1986). The riparian woodland plant community consists of plants located along primarily along Las Virgenes Creek, and at a much smaller scale along Dry Canyon Creek. The trees and plants associated with the riparian habitat include sycamore trees (*Platanus racemosa*), cottonwoods (*Populus* spp.), California bay (*Umbellularia californica*), ash (*Fraxinus* spp.), cattail (*Typha latifolia*, and *T. domingensis*), mule fat (*Baccharis salicifolia*), willows (*Salix* spp.), and a variety of flowering plants.

Grasslands

Grasslands consist of low-growing herbaceous species dominated by annual and perennial grasses and forbs. Grazing and cultivation in the Las Virgenes Creek watershed have left very little native grass. The native grasses (e.g., purple needle-grass, *Nassella pulchra*; California brome, *Bromus carinatus*; and blue wildrye, *Elymus glaucus*) that are present are located in the area south of the City in Malibu Creek State Park. Within the park they occur in small, isolated patches, remnants of the former large expanses of native grasses that once characterized the foothills and flatlands. Today, the dominant grasses in the study area are introduced, nonnative grasses (e.g., various bromes, *Bromus* spp.; wild oats, *Avena* spp.; and ryegrasses, *Lolium* spp.). Open fields contain a mix of grasses and flowering plants (McAuley 1996b). Forbs found in the grassland community within the study area include, but are not limited to, California poppy (*Eschscholzia* spp.), tarweed (*Hemizonia* spp.*Madia* spp.), lupines (*Lupinus* spp.), lilies (variety),

clover (*Trifolium* spp.), asters (variety), fennel (*Foeniculum vulgare*), and coyote melon (*Cucurbita* spp.) is also found throughout the area.

Coastal Sage Scrub

Coastal sage scrub is one of the major shrub-dominated (scrub) communities within California. This community occurs on xeric sites (i.e., sites that receive only a small amount of moisture) with shallow soils. Sage scrub species are typically drought deciduous plants with shallow root systems. Both of these adaptations allow for the occurrence of sage scrub species on these xeric sites. Coastal sage scrub, which includes buckwheat (*Eriogonum* spp), sages (*Salvia* spp.), yucca (*Yucca whipplei*), foothill needlegrass (*Nasella lepida*), and cacti (various), is considered a sensitive habitat by CDFG (Holland 1986) because this community's relatively few remaining acres supports an extremely high number of sensitive species. Coastal sage scrub is found throughout the study area with a major community in the upper Dry Canyon Creek watershed.

Freshwater Wetland

Freshwater wetland is a community dominated by perennial, emergent monocots (flowering plants that have one seed leaf), which grow in standing fresh water. This plant community can be found in very isolated areas along Las Virgenes and Dry Canyon Creeks as well as near seeps and springs. There is a large wetland dominated by Yerba Mansa (*Anemopsis californicum*) to the east of Las Virgenes Road by the sheep herders' quarters. Freshwater marsh species common in study area include cattails (*Typha* spp.), bulrushes (*Scirpus* spp.), and sedges (*Carex* spp.).

Sensitive Plants

Sensitive plant species are those that are candidates, proposed, or listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or the California Department of Fish and Game (CDFG), and those plants that are considered sensitive species by the California Native Plant Society (CNPS 2001). There are several plant species found within, or in areas adjacent to, Calabasas that are considered to be sensitive. All of these species, and their potential for occurrence within the study area, and within MCSP, are presented in Table 2.2. A total of five sensitive plants occur within the park. Four of these [i.e., Santa Susana tarplant (*Deinandra minthornii)*, marcescent dudleya (*Dudleya cymosa* ssp. *marcescens*), Santa Monica Mountains dudleya (*Dudleya cymosa* ssp. *ovatifolia*), and Lyon's pentachaeta (*Pentachaeta lyonii*)] are associated with chaparral and coastal scrub habitats. The fifth species is round-leaved filaree (*Erodium macrophyllum*), is associated with clay soils within grasslands and woodlands. Known locations for these five species within the study area are noted in Table 2.2.

Table 2.2. Sensitive Plant Species Known From the MCSP and Calabasas Region

Species	Habit and Habitat	Potential for Occurrence*	CNPS	CDFG	USFWS
Braunton's milkvetch *Astragalus brauntonii*	A perennial herb associated with chaparral, coastal scrub, valley and foothill grasslands, closed-cone coniferous forest, and in carbonate soils of recent burned or disturbed areas. Blooms March-July.	Moderate potential to occur within the MCSP. Suitable habitat is present and the occurrence may have been an isolated accidental one resulting from a storm or flood. No known presence.	1B	--	FE
Coulter's saltbrush *Atriplex coulteri*	A perennial herb associated with alkaline and clay soils of coastal dunes, coastal bluff scrub, coastal scrub, and valley and foothill grasslands. Blooms March-October.	Low potential to occur within the study area. Only known population in the region is located west of the park on the coastal bluffs of Point Dume.	1B	--	--
Malibu baccharis *Baccharis malibuensis*	A deciduous shrub found in chaparral, coastal scrub, and cismontane woodlands. Blooms in August.	Moderate potential to occur within the study area. Known populations are found along Las Virgenes Road at the base of Stokes Canyon.	1B	--	--
Plummer's mariposa lily *Calochortus plummerae*	A perennial herb found in granitic substrates of chaparral, coastal sage scrub, cismontane woodland, lower montane coniferous forest, and foothill grasslands. Blooms May-July.	Moderate potential to occur on-site. Suitable habitat occurs throughout the study area.	1B	--	FSC
San Fernando Valley spineflower *Chorizanthe parryi* var. *Fernandina*	An annual herb associated with sandy soils of coastal scrub. Blooms April-June.	Low potential to occur within the study area.	1B	SE	FC
Parry's spineflower *Chorizanthe parryi* var. *parryi*	An annual herb associated with sandy or rocky soils of coastal scrub and chaparral. Blooms April-June.	Low potential to occur on-site.	3	--	--
Santa Susana tarplant *Deinandra minthornii*	A deciduous shrub associated with sandstone soils of chaparral and coastal scrub. Blooms July-November.	Present. This shrub is known to occur within study area. A population has been recorded on Calabasas Peak. Most populations are reported from the Santa Susana Mountains.	1B	SR	--

Species	Habit and Habitat	Potential for Occurrence*	CNPS	CDFG	USFWS
Blochman's dudleya *Dudleya blochmaniae* ssp. *blochmaniae*	A perennial herb found in clay or serpentine soils of coastal bluff scrub, chaparral, coastal scrub, and valley and foothill grasslands. Blooms April-June.	Moderate potential to occur within the study area.	1B	--	--
Santa Monica Mountains dudleya *Dudleya cymosa* ssp. *agourensis*	A perennial herb associated with rocky or volcanic soils of chaparral and cismontane woodlands. Blooms May-June.	Low potential to occur within the study area. Suitable habitat occurs within the MCSP, but the closest known population is located in the Santa Monica Mountains Recreation Area, on Cornel Road.	1B	--	FT
Marcescent dudleya *Dudleya cymosa* ssp. *marcescens*	A perennial herb found in volcanic soils of chaparral habitats. Blooms April-June.	Present. This perennial herb is found in three different locations within MCSP.	1B	SR	FT
Santa Monica Mountains dudleya *Dudleya cymosa* ssp. *ovatifolia*	A perennial herb associated with volcanic soils of chaparral and coastal scrub habitats. Blooms March-June.	Present. This inconspicuous herb occurs within MCSP at the Udell Gorge Natural Preserve.	1B	--	FT
Many-stemmed dudleya *Dudleya multicaulis*	A perennial herb found in clay soils of coastal scrub, chaparral, and valley and foothill grasslands. Blooms April-July.	Low potential to occur on-site. Suitable habitat occurs within the MCSP, but the closest known population is located on the south side of Chatsworth Reservoir.	1B	--	--
Round-leaved filaree *Erodium macrophyllum*	An annual herb associated with clay soils of cismontane woodlands and valley and foothill grasslands. Blooms March-May.	Present. This annual herb has been found within MCSP. The exact location of this plant was not recorded, but is noted to occur within oak woodland habitat within the park.	2	--	--
Lyon's pentachaeta *Pentachaeta lyonii*	An annual herb associated with openings in chaparral, coastal scrub, and valley and foothill grasslands. Blooms March-August.	Present. This annual herb is found just south of the study area, approximately 0.5 mile south of Mulholland Hwy.	1B	SE	FE
Sonoran maiden fern *Thelypteris puberula* var. *sonorensis*	A perennial rhizomatous herb associated with meadows, streams and seeps. Fertile January-September.	Low potential to occur on-site.	2	--	--

* Potential for occurrence is based on California Natural Diversity Data Base (CNDDB) 2002 records, and other documents cited herein.

Species	Habit and Habitat	Potential for Occurrence	CNPS	CDFG	USFWS

USFWS: FE = Federally Endangered, FT = Federally Threatened, FSC = Federal Species of Concern.
CDFG: SE = State Endangered, ST = State Threatened, CSC = State Species of Concern, SR = State Rare.
CNPS: 1B = Species considered rare, threatened, or endangered in California and elsewhere.
2 = Species considered rare, threatened, or endangered in California, but more common elsewhere.
3 = Species considered but need more information.

Exotic Non-native Plant Species

Exotic plant species are those plants that arrived in an area through human actions. Exotic plants are considered "invasive weeds" when they colonize natural areas and dominate or displace natural communities. Some potential impacts resulting from exotic plant infestation include (1) alteration of ecosystem processes, such as nutrient cycling, erosion, and fire frequency; (2) suppression of native plant recruitment and growth; (3) reduction of wildlife resources, such as food, cover, and nesting habitat; and (4) potential negative visual impacts in areas of heavy infestation.

Exotic plants that are considered invasive weeds often have several characteristics that enable them to compete successfully with native plants by rapidly becoming established and precluding the growth of the native species. Some invasive weeds have more than one method of reproduction. In particular, they can reproduce vegetatively through the sprouting of stem and root segments, as well as sexually through seed production. Often, invasive weeds reach reproductive maturity quickly and produce large amounts of readily dispersed seeds that remain viable for long periods. In addition, invasive weeds tolerate a wide range of habitat conditions and, in many cases, are favored by repeated disturbance.

One particularly invasive plant species that occurs within the study area is the giant reed (*Arundo donax*). The giant reed, a hydrophyte, grows along lakes, streams, drainages, and other wet sites. It can grow quickly and uses large amounts of water. Giant reed reproduces vegetatively through fragmented stem nodes and rhizomes; therefore, floods and other disturbances break up clumps of individuals, which then float downstream where they root and invade other areas. Many of the occurrences of giant reed occur along Dry Canyon Creek and are located on private property.

Additionally, invasive plants can also be introduced through local landscape practices. The main ornamental landscape plants that crowd into native areas are the Virginia creeper (*Parthenocissus* spp.), Periwinkle (*Vinca major*), and Eucalyptus. These invasive plants can be found throughout the study area.

Animal Communities

The diversity of habitat types found within the study area provide habitat for a variety of animals. The natural setting of Malibu Creek State Park and Ventura County are home to a number of sensitive, threatened, and endangered species, as determined by the USFWS and/or the CDFG. The following section provides an overview of general wildlife and associated habitats that occur within and adjacent to the study area.

Aquatic Life

Aquatic life consists of a variety of fish and invertebrates that occur within the waters of the drainages and impoundments throughout the study area. The one native fish currently associated with the Las Virgenes Creek watershed is the arroyo chub (*Gila orcutti*). Historically, two additional native fish were found in Las Virgenes Creek, the southern steelhead (*Oncorhynchus myskiss*) and the Pacific lamprey (*Lampetra tridentate*). The crayfish (*Astacus fluviatilis*), an exotic aquatic invertebrate, is known to inhabit Las Virgenes Creek (Appendix B).

Dry Canyon and McCoy Creek, being located at the top of the watershed, and subject to the potential of dry channels in the summer, do not have any native fish currently associated with them. However, based on the field assessment there is a potential for reintroduction of native fish, but further water quality and quantity studies should be undertaken before attempting to do so (Appendix B).

Of the seven native fish to have potentially inhabited McCoy and Dry Canyon Creeks, the steelhead, lampreys, and stickleback were the first fish to disappear from the Los Angeles River watershed in the 1940s and 1950s. These species apparently were more sensitive to water quality issues than the dace, chub, and sucker, which lasted longer and still occur in a few places in the Los Angeles River watershed. This indicates that the chubs, sucker, and dace would be the easiest to reestablish in the Calabasas streams although there is still the issue of barriers and long segments of concrete channels to consider. Steelhead are known to survive as freshwater populations upstream of barriers to the ocean provided water quality and water quantity are adequate.

Amphibians

The transitional area at the interface between the water in the study area and the riparian and upland habitats supports a variety of amphibians, including the California newt (*Taricha tarosa*), Pacific treefrog (*Pseudacris regilla*), California treefrog (*Pseudacris cadaverina*), and California toad (*Bufo boreas halophilus*). Amphibians are typically associated with mesic areas along

streams, or under leaf litter and other objects where moisture is present. Within the study area these conditions are associated with the riparian and oak woodlands, and freshwater wetland habitats that occur primarily along Las Virgenes Creek, and to a lesser extent Dry Canyon Creek.

Reptiles

Several reptile species are known to occur within the study area, including the southwestern pond turtle (*Clemmys marmorata pallida*), San Diego horned lizard (*Phrynosoma coronatum blainvillei*), coastal western whiptail (*Cnemidophorus tigris multiscutatus*), San Bernardino ringneck snake (*Diadophis punctatus modestus*), San Diego mountain kingsnake (*Lampropeltus zonata pulchra*), and coastal rosy boa (*Lichanura trivirgata roseofusca*). The pond turtle prefers permanent streams or ponded areas, typically associated with riparian woodlands and freshwater wetlands within all three creeks. The horned lizard, western whiptail, and ringneck snake are often found in coastal sage scrub and chaparral habitats. The rosy boa also prefers to inhabit sage scrub and chaparral but is strongly associated with streams in proximity to these communities. The kingsnake is often found in riparian and oak woodland settings.

Birds

The broad and diverse vegetation communities, topography, hydrology, and geology combine to provide a variety of habitats for several resident and migratory bird species within the study area. In particular, the riparian woodland, freshwater wetland, and aquatic habitats attract migratory birds by providing valuable resources for nesting, foraging, and protective cover. Bird species typically associated with the riparian and oak woodlands within the study area include Cooper's hawk (*Accipiter cooperi*), black phoebe (*Sayornis nigricans*), phainopepla (*phainopepla nitens*), and Nuttall's woodpecker (*Picoides nuttallii*). The upland coastal sage scrub, chaparral, and grassland habitats within the study area support species such as wrentit (*Chamaea fasciata*), lesser goldfinch (*Carduelis psaltria*), and bushtit (*Psaltriparus minimus*).

Mammals

Development in the study area has destroyed a great deal of natural habitat, limiting animals to pockets of land in which they can survive. These areas are located primarily in Malibu Creek State Park and in Ventura County and provides ideal habitat for many mammals, which flourish in an area untouched by development. Typical large mammals that have potential in the study area include the nonnative red fox (*Vulpes vulpes*), the native gray fox (*Urocyon cinereoargenteus*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), bobcat (*Felis rufus*), and mountain lion (*Felis concolor*). These mammals roam the hillsides and feed on

rodents, small mammals, berries, amphibians, and reptiles. Large mammals typically use a variety of vegetation communities, including riparian and oak woodlands for cover, grassland and scrub vegetation for forage, and marsh and aquatic communities as sources of water. Small mammals in the study area include Botta's pocket gopher (*Thomomys bottae*), bats (including *Myotis* spp. and *Tadarida* spp.), brush rabbit (*Sylvilagus bachmani*), California ground squirrel (*Spermophilus beecheyi*), raccoon (*Procyon lotor*), mice (including *Peromyscus* spp. and *Reithrodontomys* sp.), woodrats (*Neotoma* spp.), ring tail cat (*Bassariscus astutus*) and others. Small mammals are associated with a wide range of habitats, including the coastal sage scrub, chaparral, grassland, and riparian communities.

Sensitive Animals

Sensitive wildlife are those animal species that are candidates, proposed, or listed as threatened or endangered by the USFWS or CDFG, and those animals that are considered species of concern or are listed as protected or fully protected by the state (CDFG 2003). Additionally, raptors protected under the federal Bald Eagle Protection Act are also considered sensitive species. The USFWS had maintained "Category 2" (C2) and "Category 3" (C3) species candidate lists, which had the similar function as the state lists for species of concern. However, USFWS has since discontinued the recognition of that term and has dropped the C2 and C3 candidate designations in 1995. CDFG has designated all former C2 and C3 species as "federal species of concern." This is a state designation and does not confer any federal protection or status. There are several fish, amphibian, reptile, bird, and mammal species found within, or in areas adjacent to, the study area that are considered to be sensitive, as well as other sensitive species whose distributional range and habitats coincide with the study area. All of these species, and their potential for occurrence within the study area, are presented in Table 2.3.

One sensitive fish species, the arroyo chub, is known to inhabit Las Virgenes Creek. The arroyo chub is considered a species of concern by the CDFG. Historically, the southern steelhead trout, inhabited Las Virgenes Creek, and is listed by the USFWS as endangered, and the CDFG considers both as species of concern. Northern San Diego County represents the present-day southern limit of steelhead distribution in California. The Malibu Creek Watershed steelhead represent an especially important resource, the last of a local race that has survived in the hot, dry climate of Southern California (Appendix B).

Table 2.3. Sensitive Animal Species Known from Malibu Creek State Park or Within the Study Area

Species	Habitat	Potential for Occurrence*	CDFG	USFWS
Fish				
Arroyo chub *Gila orcutti*	Slow-moving streams with mud or sand bottoms.	Known from Las Virgenes Creek	CSC	--
Southern steelhead *Oncorhynchus mykiss irideus*	Stream habitat with riffles on coarse gravel or sand is required for spawning.	Known from Malibu Creek, from Rindge Dam to the ocean but currently blocked from returning to Las Virgenes Creek by Rindge Dam.	CSC	FE
Amphibians				
Arroyo toad *Bufo californicus*	Breeds in shallow, slow-moving intermittent streams on sand or cobble substrate; over-winters in adjacent uplands.	Low potential to occur within the study area along ephemeral or intermittent streams.	CSC	FE
Red-legged frog *Rana aurora draytonii*	Frequents marshes, slow parts of streams, lakes, reservoirs, ponds, and other usually permanent water sources.	Low potential to occur within the study area, in areas of permanent surface water north of the Ventura County line.	CSC	FT
Reptiles				
Southwestern pond turtle *Clemmys marmorata pallida*	Permanent or near permanent bodies of water associated with marsh and riparian vegetation.	Known from several locations along all three creeks	CSC	--
San Diego horned lizard *Phrynosoma coronatum blainvillei*	Frequents a variety of habitats from sage scrub and chaparral to coniferous and broadleaf woodlands; often found on sandy or friable soils with open scrub.	Known from the study area south to Tapia Park.	CSC	--
California horned lizard *Phrynosoma coronatum frontale*	Frequents a variety of habitats from sage scrub and chaparral to coniferous and broadleaf woodlands; often found on sandy or friable soils with open scrub.	High potential to occur within the study area.	CSC	--
Coast patch-nosed snake *Salvadora hexalepis virgultea*	Prefers open coastal sage scrub, chaparral, riparian habitat, grasslands, and agricultural fields with friable or sandy soils.	Moderate potential to occur within study area. Suitable habitat occurs throughout most of the Malibu Creek State Park.	CSC	--
San Diego mountain kingsnake *Lampropeltis zonata pulchra*	Prefers rock outcrops in pine and oak woodlands with moisture present, but can occur in other habitats such as chaparral and wet meadow.	Known from Stunts Ranch and Cold Creek Canyon Preserve. High probability to occur in suitable habitats along all three creeks.	CSC	--

Species	Habitat	Potential for Occurrence*	CDFG	USFWS
Two-striped garter snake *Thamnophis hammondi*	Habitat occurs along streams with rocky beds and permanent freshwater.	High potential to occur within the study area. Known from Malibu Creek State Park.	CSC	--
Birds				
Least bittern *Ixobrychus exilis hesperis*	Fresh and brackish water marshes, usually near open water sources.	Moderate potential to occur in suitable freshwater marsh habitat within the study area.	CSC	--
Cooper's hawk *Accipiter cooperii*	Nests primarily in oak woodlands but occasionally in willows or eucalyptus.	High potential to occur within the woodland and riparian habitats within the study area.	CSC	--
Swainson's hawk *Buteo swainsoni*	Builds relatively fragile nests in shrubs and trees along wetlands and drainages, and in windbreaks in fields and around farmsteads.	Low potential to occur within the study area. Not known to nest in southern California.	CT	--
Golden eagle *Aquila chrysaetos*	Forages in grassy and open scrub habitats; nests primarily on cliffs, with secondary use of large trees.	Known to occur within Malibu Creek State Park.	CSC	BEPA
Southwestern willow flycatcher *Empidonax traillii extimus*	Restricted to wide bands of dense riparian woodlands of willow, cottonwood, oak, and other deciduous shrubs and trees.	Low potential to occur within the study area due lack of wide bands of suitable riparian habitat.	CE	FE
California horned lark *Eremophila alpestris actia*	Resident of grasslands and open habitats such as agricultural fields, beaches, and disturbed areas.	Moderate potential to occur in the grasslands in the study area.	CSC	--
Coastal California gnatcatcher *Polioptila californica californica*	Coastal sage scrub habitats, typically on gentle slopes.	High potential to occur within Malibu Creek State Park in suitable areas of coastal sage scrub habitat. Known to occur in the area east of Las Virgenes Road.	CSC	FT
Loggerhead shrike *Lanius ludovicianus*	A variety of habitats, occurring wherever bushes or trees are scattered on open ground.	High probability to occur within the study area, particularly in areas with open vegetation.	CSC	--
Least Bell's vireo *Vireo bellii pusillus*	Restricted to riparian woodland and scrub, particularly in areas with an understory of dense young willows or mulefat with a canopy of tall willows.	Moderate potential to nest within the riparian woodland habitat along Las Virgenes Creek.	CE	FE
Southern California rufous-crowned sparrow *Aimophila ruficeps canescens*	Prefers grassy or rocky slopes with open scrub, particularly coastal sage scrub.	High probability to occur within the study area throughout the scrub and grassland habitats.	CSC	--

Species	Habitat	Potential for Occurrence*	CDFG	USFWS
Mammals				
San Diego desert woodrat *Neotoma lepida intermedia*	Inhabits a variety of scrub habitats where it constructs large middens, usually consisting of small twigs, cactus pads, and other plant material.	High probability to occur in the study area.	CSC	--

* Potential for occurrence is based on California Natural Diversity Data Base (CNDDB) 2002 records, and other documents cited herein.
USFWS: FE = Federally Endangered, FT = Federally Threatened, BEPA = Bald Eagle Protection Act.
CDFG: CE = State Endangered, CT = State Threatened, CSC = State Species of Concern.

Although no sensitive amphibians are known to occur within the study area, two sensitive amphibian species, the arroyo toad (*Bufo californicus*), and the red-legged frog (*Rana aurora draytonii*) have been documented north of the Ventura County line. The arroyo toad and red-legged frog are federally listed by the USFWS as endangered and is considered a CDFG species of concern.

The southwestern pond turtle, San Diego horned lizard, and San Diego mountain kingsnake are all considered reptile species of concern by the CDFG. The pond turtle is known to occur along all three creeks. The CNDDB also contains a record of the San Diego mountain kingsnake in the Cold Creek Preserve area.

Several of the migrant and resident bird species of the study area are considered sensitive by the federal or state resource agencies. One sensitive species, the golden eagle (*Aquila chrysaetos*), is a CDFG species of concern and is federally protected under the Bald Eagle Protection Act. The coastal California gnatcatcher (*Polioptila californica californica*), listed by the USFWS as threatened, and considered a species of concern by the CDFG, has been documented to the north of Mulholland and east of Las Virgenes Road.

Exotic Non-native Animal Species

The aquatic invertebrate species of biological resource management concern in Las Virgenes are the crayfish and bull frog. Both species have been introduced and prey on native amphibians and fishes. The presence of these species threatens the ecosystem of the Malibu Creek Watershed.

The Virginia opossum (*Didelphis virginiana*) is a nonnative mammal species that was first introduced to northern California in 1910 and has expanded its range down the entire length of the state. This opportunistic feeder competes with native small mammals for food and other resources.

Wildlife Movement Corridors and Habitat Linkages

A wildlife corridor can be defined as a linear landscape feature of sufficient width and buffer to allow animal movement between two patches of comparatively undisturbed habitat, or between a patch of habitat and some vital resources. Regional corridors are defined as those linking two or more large areas of natural open space. Local corridors are defined as those allowing resident animals to access critical resources (food, cover, and water) in a smaller area that might otherwise be isolated by urban development.

Habitat linkages can be defined as large areas of natural open space that provide connectivity to regional biological resources. These linkages are not narrow corridors through which wildlife species must pass to access critical resources. Instead, habitat linkages are wide enough to allow relatively free movement of wildlife species along multiple paths between resources.

Wildlife corridors and habitat linkages are essential in geographically diverse settings, and especially in urban settings, for the sustenance of healthy and genetically diverse animal communities. At a minimum, they promote colonization of habitat and genetic variability by connecting fragments of like habitat, and they help sustain individual species distributed in and among habitat fragments. Habitat fragments, by definition, are separated by otherwise foreign or inhospitable habitats, such as urban/suburban tracts. Isolation of populations can have many harmful effects and may contribute significantly to local species extinction.

A viable wildlife corridor consists of more than a path between habitat areas. To provide food and cover for transient species as well as resident populations of less mobile animals, a wildlife corridor must also include pockets of vegetation.

Malibu Creek State Park currently serves as a functioning wildlife habitat linkage within the Santa Monica Mountains. The natural open space provides biological resources that attract wildlife from throughout the region by providing protective cover, water, and forage for a variety of species, including the mountain lion, mule deer, and coyote. The park provides direct habitat linkages with other areas of open space.

Malibu Creek State Park is the starting point for local wildlife movement corridor functions within the Santa Monica Mountains and is a potential regional corridor. The vegetated drainages outside the study area, including Malibu Creek and Liberty Canyon, are natural corridors which provide local routes for a variety of wildlife species to move between resources in Malibu Creek State Park and open space in Ventura County. The southern steelhead is the one notable species that faces difficulty moving through the Malibu Creek corridor. Currently, the southern steelhead can only travel along Malibu Creek from the ocean to Rindge Dam, at which point it

cannot continue farther upstream into the tributaries of Malibu Creek such as Las Virgenes Creek.

The upper Dry Canyon watershed serves as a wildlife corridor and linkage between Topanga State Park and the Cold Creek Preserve extending down to Malibu Creek State Park. The upper Dry Canyon watershed also serves as a critical corridor for the open space areas in and around the subdivisions of Calabasas Park to the protected areas of the SMMNRA.

The City also has plans to restore a critical corridor located on Las Virgenes Creek between the Agoura Road bridge and the 101 Freeway. This site will link the Baldwin open space withthe Malibu Creek State Park, while restoring riparian habitat and improving the aesthetics of this creek section adjacent to a new shopping center.

2.3 HYDROLOGY/HYDRAULICS

2.3.1 Existing Conditions

Baseline conditions for Las Virgenes, McCoy, and Dry Canyon Creeks were assessed during field visits performed in January 2003 and a follow-up visit in March. The riparian assessment procedure developed for this project evaluated physical and hydrological properties of stream reaches, presence of plant and animal species, and adjacent vegetation communities and land uses.

Las Virgenes Creek

Las Virgenes Creek crosses the northern boundary of Calabasas flowing south out of undeveloped, gently rolling hills and through a willow forest (Table 2.4). A short segment of incised dirt channel lined with emergent wetland vegetation transitions to a 20-foot wide trapezoidal concrete channel that is flanked by dense residential uses. From Thousand Oaks Boulevard, south to Parkmor Road, the channel flows through a box culvert. Tributary to this reach is a detention basin that drains runoff from a large development to the west and runs east under Las Virgenes Road to the creek. At Parkmor Road, the culvert goes underground and resurfaces south of the commercial uses northeast of the intersection of Las Virgenes Road and the Ventura Freeway. A tributary that flows west along the north side of the Ventura Freeway joins the creek there.

Table 2.4. Characteristics of Las Virgenes Creek

Reach	Characteristics		
	Physical	Hydrological	Biological
Upstream of City boundary	2:1 bank slope	intermittent	willow forest
City boundary to Parkmor	20 ft concrete trap/box channel	low flow	sparse vegetation (weeds, grasses)
Parkmor to south of Mureau	underground channel	medium flow	None
Eastern tributary north of the 101 Freeway	Concrete channel	medium flow	Willow forest
Las Virgenes Rd to the 101 Freeway	concrete/riprap, gentle slope, braiding	medium flow	willow forest emergent wetlands
101 Freeway to Agoura Rd	50 ft concrete trapezoidal channel	medium flow	willow saplings
Agoura Rd to Las Virgenes Rd	natural bottom, gentle slope, floodplain encroachment	medium flow	willow forest, mulefat scrub, emergent wetlands
Malibu Creek State Park	meandering channel, some incision	medium flow	willow forest, mulefat scrub

The creek passes west under Las Virgenes Road into a stretch of willow forest that extends along the north side of the Ventura Freeway (outside the City's boundaries) approximately 1,500 feet before crossing under the highway to the south. Along this reach, the creek is bordered to the northwest by a small floodplain and disturbed hillside and to the southeast by riprap and concrete stabilizing structures. The natural portion of the channel in this reach is characterized by meanders, riffle/pool complexes, and a gentle slope. In some areas, the banks show signs of instability, and there are bar formations in the channel.

Just south of the Ventura Freeway, Las Virgenes Creek flows through a 50-foot-wide trapezoidal concrete channel for a distance of approximately 300 feet. Sediment deposits on the concrete bottom support some vegetation, including willow saplings. Both sides of the channel are bordered by commercial uses with large asphalt parking lots. The concrete channel ends after passing south under Agoura Road.

South of Agoura Road, Las Virgenes Creek flows approximately 3 miles through dense residential and commercial uses before passing south into MCSP. Throughout this reach, most of the creek maintains a natural soft bottom with small pockets of mulefat scrub, southern willow scrub, and emergent wetlands combined with primarily willow forest vegetation. Pockets of exotic vegetation such as eucalyptus, tamarisk, and vinca exist along the banks.

While much of the channel in this stretch is characterized by a gentle slope and shallow depth, development encroaches on the creek floodplain, and in several locations cement structures have been installed to stabilize banks or channelize the stream for short distances. In addition, storm

water outlets drain into the creek periodically throughout this segment. In some places, restriction of flow has led to channel incision or bank instability.

North of the intersection of Lost Hills Road and Las Virgenes Road, the Resource Conservation District of the Santa Monica Mountains (RCD) has completed the Las Virgenes Creek Stream and Habitat Restoration project, a riparian habitat improvement project. The creek passes under Lost Hills Road through a concrete culvert, then flows adjacent to De Anza Park and into MCSP.

As the creek flows through MCSP, it maintains a fairly natural course due to the lack of development within the floodplains. Las Virgenes Road parallels the creek south about 300 feet from the eastern bank. Throughout this reach, the creek is characterized by a meandering channel incised in some locations due to increased flow from the upper watershed.

Dry Canyon Creek

The upper extent of the Dry Canyon Creek watershed is located in the Calabasas Highlands area and is located parallel to Mulholland Highway, just upstream of the Viewpoint School. In this area, the creek channel supports large willows, and surrounding upland vegetation consists of chaparral and coastal sage scrub (Table 2.5). After emerging from the underground culvert and passing south under Mulholland Highway, the creek bends to the southwest adjacent to Viewpoint School, where the bottom and banks have been stabilized with concrete and rock walls.

Table 2.5. Characteristics of Dry Canyon Creek

Reach	Characteristics		
	Physical	Hydrological	Biological
Top of watershed	natural channel	intermittent	oak woodland
Mountains Restoration Trust/Headwaters Corner	concrete bottom, stone wall stabilizing bank	low flow	disturbed oak woodland
Wrencrest Drive to Park Ora	natural channel, walls constraining floodplain	medium flow	southern willow scrub
Park Ora to City boundary	natural bottom with meanders	medium flow	mature trees

Dry Canyon Creek then passes south of the horse stable southwest of the intersection of Mulholland Highway and Old Topanga Canyon Road where areas of the creek bank have been stabilized with a mixture of rocks and concrete. A wooden bridge also crosses the creek at this location.

Before crossing back under Mulholland Highway to the north, the creek is joined by a tributary that flows north along Old Topanga Road. The tributary flows adjacent to the road collecting

runoff from storm water culverts and street flows and is constricted in several locations by driveway culverts. The surrounding vegetation community along this segment is primarily oak woodland.

North of the Mulholland Highway/Old Topanga Canyon Road intersection, Dry Canyon Creek flows through Mountains Restoration Trust property, then along the west side of Old Topanga Canyon Road before passing into an underground culvert south of Palm Drive. The creek travels underground for about 0.5 mile before emerging in a residential area near Wrencrest Drive. As the creek continues to the north, the channel is characterized by a gentle slope, natural bottom, and riparian vegetation. The floodplain in this area is constricted by crib walls that stabilize the adjacent terrace for surrounding residential uses.

The crib wall on the western side of the creek ends near the northern boundary of Calabasas and the floodplain expands into a park area containing mature oak trees. A 12-foot-wide cement ramp descends from Park Paloma above to the west into the creek channel.

North of Calabasas, Dry Canyon Creek crosses into Los Angeles City. The natural channel is then contained in a box culvert that continues under the Ventura Freeway. North of the Ventura Freeway, Dry Canyon Creek joins McCoy Creek to form Calabasas Creek.

McCoy Creek

The top of the McCoy Creek watershed is located in the New Millennium housing development, which is located at the end of Parkway Calabasas. The creek emerges from a cement underground culvert under Parkway Calabasas at the east end of the New Millennium property and flows through an area of native vegetation and natural channel until passing into a golf course, which flanks the creek on both sides for the next 0.6 mile (Table 2.6).

Table 2.6. Characteristics of McCoy Creek

Reach	Characteristics		
	Physical	Hydrological	Biological
New Millennium to golf course	gentle slope – emerges from culvert from community	low flow	riparian oak woodland
Golf course	modified channel, floodplain encroachment	moderate flow	turf grass, ornamentals
Park Capri to the Swim and Tennis Center	natural channel with downcutting, some bank stabilization	moderate flow	oak woodland/turf upland vegetation
Swim & Tennis Center to Calabasas Road	north bank stabilized with cement, check structures in channel	moderate flow	some natives planted on banks

Upstream of the golf course, approximately 175 feet of the creek channel, vegetation is primarily natural, then the bank vegetation transitions to turf grass and ornamentals. The segment flowing through the golf course is restricted at several locations by cart path and road crossings, underground culverts, and bank stabilizing structures. Just west of Park Entrada, the creek is joined from the south by a tributary that crosses under Parkway Calabasas from Bay Laurel School. The confluence is lined with concrete.

McCoy Creek passes under Parkway Calabasas through two box culverts and empties onto the private grounds of Countrywide Financial. Within the Countrywide site, the creek is maintained as a natural park with recreational uses available to employees.

The Countrywide Financial property ends at Park Capri where the creek flows under the road and into the park adjacent to Lake Calabasas. In the western portion of the park the creek is bordered to the north by high-density residential uses. Gabions stabilize the north bank along some of this stretch. The southern bank is natural and contains oak woodland vegetation that transitions to turf grass closer to the lake. A concrete lake overflow structure drains into the creek south of the Calabasas Tennis and Swim Center. Downstream of the overflow, concrete has been used to stabilize the east and west banks of the creek.

Near the northern boundary of Calabasas, the creek channel has been stabilized with riprap and check structures before it crosses under Calabasas Road in Old Town Calabasas. On the north side of Calabasas Road, the creek crosses under the Ventura Freeway to join Dry Canyon Creek and form Calabasas Creek.

2.4 WATER QUALITY

2.4.1 Regulatory Setting for Water Quality

The RWQCB-LA adopted the Water Quality Control Plan, Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (The Basin Plan) in 1994 for the purpose of preserving and enhancing water quality and protecting designated beneficial uses of all regional waters. The Basin Plan incorporates all applicable state and Regional Board plans and policies and other pertinent water quality policies and regulations. The Basin Plan also defines beneficial uses of surface waters and identifies the potential, existing, and intermittent beneficial uses of each waterbody within the region. Additionally, the Basin Plan identifies Water Quality Objectives for inland surface waters within the region.

Waterbodies that do not or are not expected to attain the Water Quality Objectives are identified on the 303(d) list of impaired surface waters within the Los Angeles Region. Each pollutant that

contributes to the impairment of a beneficial use of the waterbody is listed, and a TMDL for each is developed and implemented.

2.4.1.1 Beneficial Uses

The three major streams within Calabasas, McCoy Creek, Dry Canyon Creek, and Las Virgenes Creek, drain into two different watersheds: Malibu Creek and the Los Angeles River. These waters share a number of existing, intermittent or potential beneficial uses, which include:

- Municipal and Domestic Supply (MUN) – Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- Water Contact Recreation (REC-1) – Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or bathing in natural hot springs.
- Noncontact Water Recreation (REC-2) – Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.
- Warm Freshwater Habitat (WARM) – Uses of water that support warm water ecosystems including, but not limited to, preservation of enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.
- Wildlife Habitat (WILD) – Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

McCoy Canyon Creek and Dry Canyon Creek also share the following intermittent uses:

- Ground Water Recharge (GWR) – Uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Las Virgenes Creek has the following additional existing or potential beneficial uses:

- Cold Freshwater Habitat (COLD) – Uses of water that support cold water ecosystems

including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

- Rare, Threatened, or Endangered Species (RARE) – Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened, or endangered.
- Migration of Aquatic Organisms (MIGR) – Uses of water that support habitats necessary for migration, acclimatization between freshwater and saltwater, or other temporary activities by aquatic organisms, such as anadromous fish.
- Spawning, Reproduction, and/or Early Development (SPWN) – Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.
- Wetland Habitat (WET) – Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions that enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

2.4.1.2 Water Quality Objectives

The Basin Plan outlines the water quality objectives that are used in conjunction with beneficial uses to act as water quality standards. When the water quality standards are exceeded then there is the potential for enactment of a TMDL (see Section 2.4.1.3).

Narrative or numerical water quality objectives have been developed for numerous parameters and apply to all inland surface waters in the region.

Ammonia

The neutral, un-ionized ammonia species (NH3) is highly toxic to fish and other aquatic life. The ratio of toxic NH3 to total ammonia (NH4 + NH3) is primarily a function of pH, but it is also affected by temperature and other factors. Additional impacts can also occur as the oxidation of ammonia lowers the dissolved oxygen content of the water, further stressing aquatic organisms. Ammonia also combines with chlorine to form chloramines – persistent toxic compounds that extend the effects of ammonia and chlorine downstream. When ammonia oxidizes, it forms nitrates.

Bacteria, Coliform

Total and fecal coliform bacteria are used to indicate the likelihood of pathogenic bacteria in

surface waters. Water quality objectives for total and fecal coliform bacteria vary with the beneficial uses of the water body. In waters designated for water contact recreation (REC-1), the fecal coliform bacteria concentration shall not exceed a log mean of 200/100 milliliters (ml) (based on a minimum of not less that four samples for any 30-day period), nor shall more than 10% of samples collected during any 30-day period exceed 4000/100 ml.

Biological Oxygen Demand (BOD)

The 5-day BOD test indirectly measures the amount of degradable organic material in water by measuring the residual dissolved oxygen after a period of incubation (usually 5 days at 20 degrees Centigrade [°C]), and is primarily used as an indication of efficiency of wastewater treatment processes. The Basin Plan states that waters shall be free of substances that result in increases in the BOD that adversely affect beneficial uses.

Exotic Vegetation

Exotic (nonnative) vegetation introduced in and around streams is often of little value as habitat for aquatic-dependant biota. Exotic plants can quickly out compete native vegetation and cause other water quality impairments.

Floating Material

Floating materials can be an aesthetic nuisance as well as provide substrate for undesirable bacterial and algal growth and insect vectors. The Basin Plan states that waters shall not contain floating materials, including solids, liquids, foams, and scum in concentrations that cause a nuisance or adversely affect beneficial uses.

Mineral Quality

Mineral quality in natural waters is largely determined by the mineral assemblage of soils and rocks and faults near the land surface. Point and nonpoint source discharges of poor quality can degrade the mineral content of natural waters. High levels of dissolved solids render waters useless for many beneficial uses. For the Malibu Creek Watershed the objectives are total dissolved solids (TDS) 2,000 mg/l, sulfate 500 mg/l, chloride 500 mg/l, and nitrogen 10 mg/l.

Nitrogen (Nitrate, Nitrite)

Excess nitrogen in surface waters can lead to excess aquatic growth and can contribute to elevated levels of NO3 in groundwater. Waters shall not exceed 10 mg/l nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO3-N + NO2-N), 45 mg/l as nitrate (NO3), 10 mg/l as nitrate-

nitrogen (NO3-N) or 1 mg/l as nitrite-nitrogen (NO2-N).

Oil and Grease

Oil and grease are not readily soluble in water and form a film on the water surface. Oily films can coat birds and aquatic organisms, impacting respiration and thermal regulation, and cause death. Oil and grease can also cause nuisance conditions (odors), are aesthetically unpleasant, and can restrict a wide range of beneficial uses.

Dissolved Oxygen (DO)

Adequate DO levels are required to support aquatic life. Depression of DO can lead to anaerobic conditions resulting in odors, or in extreme cases, in fish kills. As a minimum, the mean annual DO concentration of all waters shall be greater than 7 milligrams per liter (mg/l), and no single determination shall be less than 5.0 mg/l, except when natural conditions cause lesser concentrations.

pH

The hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. While a pH of "pure" water at 25°C is 7.0, the pH of natural waters is usually slightly basic due to the solubility of carbon dioxide from the atmosphere. Minor changes from natural conditions can harm aquatic life.

Solid, Suspended, or Settleable Materials

Surface waters carry various amounts of suspended and settleable materials from both natural and human sources. Suspended sediments limit the passage of sunlight into waters, which in turn inhibits growth of aquatic plants. Excessive deposition of sediments can destroy spawning habitat, blanket benthic organisms, and abrade the gills of larval fish. Waters shall not contain suspended or settleable material in concentrations that cause nuisance or adversely affect beneficial uses.

Turbidity

Turbidity is an expression of the optical property that causes light to be scattered in water due to particulate matter such as clay, silt, organic matter, and microscopic organisms. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed an increase of 20% when the natural turbidity is 0 to 50 nephelometric turbidity units (NTUs).

Wetland Objectives

In addition to the regional objectives for inland surface waters (including wetlands), the following objectives apply for the protection of wetlands in the region.

Hydrology

Natural hydrologic conditions necessary to support the physical, chemical, and biological characteristics present in wetlands shall be protected to prevent significant adverse effects on:

- Natural temperature, pH, DO, and other natural physical/chemical conditions;
- Movement of aquatic fauna;
- Survival and reproduction of aquatic flora and fauna; and
- Water levels.

Habitat

Existing habitats and associated populations of wetland fauna and flora shall be maintained by:

- Maintaining substrate characteristics necessary to support flora and fauna that would be present naturally,
- Protecting food supplies for fish and wildlife,
- Protecting reproductive and nursery areas, and
- Protecting wildlife corridors.

2.4.1.3 Storm Water Requirements

Discharge and runoff into inland surface and ocean waters in the Los Angeles Region are controlled by a number of quality standards and implementation plans. These include permitting and waste discharge requirement programs that address point source pollutants as well as storm water and nonpoint source programs that address urban runoff. The City of Calabasas is subject to the urban runoff requirements described in Order No. 01-182, NPDES Permit No. CAS004001 – Waste Discharge Requirements for Municipal Storm Water and Urban Runoff Discharges within the County of Los Angeles, and the Incorporated Cities Therein, Except the City of Long Beach, which was issued by the RWQCB-LA, in 2001. Permittees include the Los Angeles

County Flood Control District, the County of Los Angeles, and 84 incorporated cites within the Los Angeles County Flood Control District. The Regional Board finds in the permit that the Permittees' proposed Storm Water Quality Management Plan (SQMP) incorporating the additional and/or revised provisions contained in the Order would meet the minimum requirements of federal regulations.

The objective of the order is to protect the beneficial uses of receiving waters in Los Angeles County. To accomplish this, permittees are required to:

- Ensure that the discharge of non-storm water to the municipal separate storm sewer system (MS4) has been effectively prohibited except in specified allowable instances.
- Ensure that storm water discharges from the MS4 neither cause nor contribute to the exceedance of water quality standards and objectives, nor create conditions of nuisance in the receiving waters.
- Specify BMPs in the SQMP that will be implemented to reduce the discharge of pollutants in storm water to the maximum extent practicable (MEP).
- Coordinate with the Principal Permittee (the Los Angeles County Flood Control District) to implement a Public Information and Participation Program (PIPP).
- Implement programs to minimize storm water pollution impacts from industrial and commercial facilities, development and redevelopment projects, construction sites, and public agencies.
- Eliminate all illicit connections and illicit discharges to the storm drain system.

Total Maximum Daily Loads

Under section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. These impaired waters do not meet water quality standards that states, territories, and authorized tribes have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop Total Maximum Daily Loads (TMDLs) for these waters.

A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and allocates pollutant loadings among point and nonpoint pollutant sources. By law, EPA must approve or disapprove lists and TMDLs established by states, territories, and authorized tribes. If a state, territory, or authorized tribe submission is inadequate, EPA must establish the list or the TMDL. EPA issued regulations in 1985 and 1992

that implement section 303(d) of the Clean Water Act - the TMDL provisions.

In February 2003, the RWQCB-LA approved the 2002 Clean Water Act Section 303(d) list of impaired waterbodies, which identifies seven pollutants for Las Virgenes Creek, including high coliform count, nutrients (algae), organic enrichment/low dissolved oxygen, scum/foam-unnatural, sedimentation/siltation selenium, and trash.

The EPA is developing TMDLs in 2003 for coliform count and nutrients in Malibu Creek, which are scheduled to be adopted by the RWQCB-LA within a year. A trash TMDL is expected to be developed for the Malibu Creek watershed by 2004 (Table 2.7).

Table 2.7. TMDLs for Las Virgenes, McCoy, and Dry Canyon Creeks

Creek	303(d) Listing	TMDL Schedule	EPA Priority
Las Virgenes	High coliform count	2003 (draft under review)	High
	Nutrients (algae)	2003	High
	Organic enrichment/low dissolved oxygen	2002 (but not completed yet)	High
	Scum/foam-unnatural	2002 (but not completed yet)	High
	Sedimentation/siltation	No date	Low
	Selenium	2004	High
	Trash	2004	Medium
McCoy	Fecal coliform	Not specified	Low
	Nitrate	Not specified	Low
	Nitrate as nitrogen	Not specified	Low
	Selenium, total	Not specified	Low
Dry Canyon	Fecal coliform	Not specified	Low
	Selenium, total	Not specified	Low

McCoy Creek and Dry Canyon Creek were both identified on the 2002 impaired water body list (303(d) list). Both drainages have been identified as impaired for fecal coliform and total selenium, which can impact warm freshwater and wildlife habitat beneficial uses. In addition, McCoy Creek has been listed as impaired for nitrate, and nitrate as nitrogen, which can impact groundwater recharge beneficial uses.

2.4.1.4 Pollutant Sources

The NPDES Permit No. CAS004001 identifies development and urbanization as causing an increase in pollutant load, volume, and discharge velocity due to two main factors: conversion of pervious ground cover to impervious surfaces such as paved highways, streets, rooftops and parking lots; and creation of new pollution sources as the increased density of human population brings proportionately higher levels of vehicle emissions, vehicle maintenance wastes, pet wastes, trash, and other anthropogenic pollutants.

The Permit cites the seven highest priority industrial and commercial critical source types as identified by the County of Los Angeles: wholesale trade (scrap recycling, auto dismantling), automotive repair/parking, fabricated metal products, motor freight, chemical and allied products, automotive dealers/gas stations, and primary metal products. In addition, automotive service facilities and food service facilities sometimes discharge polluted washwaters to the MS4 and have been identified as a major cause of widespread contamination and water quality problems.

Local Sources of Pollutants

Based on information provided by public agencies, published values from prior studies, and field observations the main source of pollutants in the local watersheds is non-point source related. These sources include; over irrigation of landscaping, erosion of native soils, septic systems, livestock, pet and yard waste and other human related activities (Table 2.8).

Table 2.8. Local Sources of TMDL Pollutants

Pollutant	Pollutant Source
Coliform	Septic system failure Livestock waste Pet waste Decomposition of organic debris Trash
Nutrients	Livestock waste Reclaimed water irrigation Septic system failure Landscape and yard waste Atmospheric deposition
Organic enrichment/low dissolved oxygen	Decomposition of organic debris Trash
Scum/foam-unnatural	Numerous potential sources
Sedimentation/siltation	Erosion of native soil
Selenium	Erosion of native soil
Trash	Human activities

2.4.1.5 Best Management Practices

The Permit requires that the SQMP specify BMPs that will be implemented to reduce the discharge of pollutants in storm water to the maximum extent practicable. For example, Landscape and Recreational Facilities Management requirements include implementation of procedures to encourage retention and planting of native vegetation and to reduce water, fertilizer, and pesticide needs.

The Permit includes provisions that promote customized initiatives, both on a countywide and watershed basis, in developing and implementing cost-effective measures to minimize discharge of pollutants. For example, if a Permittee identifies a need to implement additional or different controls than described in the countywide SQMP, a Permittee may develop and request RWQCB approval for implementation of a Local SQMP that is customized to reflect the conditions in the area under the Permittee's jurisdication. A Permittee group can also apply to substitute a regional or subregional storm water mitigation program to substitute in part or wholly for the Standard Urban Stormwater Mitigation Plan (SUSMP) requirements set forth in the Development Planning Program of the Permit. The proposed substitute program will be considered for approval by the RWQCB if its implementation will result in equivalent or improved storm water quality, protect stream habitat, promote cooperative problem solving by diverse interests, be fiscally sustainable and include secure funding, and be completed in 5 years including the construction and start-up of treatment facilities.

Existing City Programs

Storm water BMPs are implemented on both public and private land throughout the City of Calabasas. Pursuant to Title 17, Land Use and Development, Chapter 17.56 and Title 8, Health and Safety Chapter 8.28 of the Calabasas Municipal Code relating to the control of pollutants carried by storm water runoff, all new developments are conditioned to include BMPs as applicable per the SUSMP requirements. The Environmental Services Manager in the Public Works Department has the primary responsibility for ensuring that the requirements are implemented. In addition, Chapter 17.26 of the Land Use and Development Code requires a percentage of property to remain pervious depending on the zoning of the property proposed for development. For example, thirty percent of pervious area is required for all new parking lots, with runoff either being directed to those pervious areas or media filtration or like BMP installed to remove oil and grease from storm water flowing over parking lots, with the developer required to submit proof of ongoing maintenance of the media filtration or like device prior to issuance of building permits. These requirements are implemented during the Development Review Committee (DRC) for all development priority projects.

In addition to BMPs implemented on new developments, the City has also implemented structural BMPs in certain priority locations around the City. To date, the City has installed 41 catch basin filter inserts and two in-line gross solids removal units in the municipal storm drain system, with an additional gross solids removal unit to be installed in the near future. Based on the results of this study and subsequent project-specific investigations, the City will continue to seek funding for and implement additional storm water BMPs designed to reduce pollutant loading to the receiving waters to the maximum extent practicable.