



THE OPEN SPACE AND CONSERVATION PLAN

A. INTRODUCTION

This chapter contains the Open Space/Conservation Plan which includes an inventory of natural resources, an inventory of open space land, and an assessment of the various resources contained within Glendale's hillside areas. It is the intent of this chapter to comply with the requirements of the California Government Code in order to assess Glendale's important natural resources and to develop strategies for their preservation and utilization. This chapter provides for the detailed analysis and inventory of open space resources. This information will provide the basis for establishing programs to conserve and preserve Glendale's natural resources. Given the urban form that has developed in the City, this element addresses those resources which are present in the City. Topics such as forests, minerals (i.e., oil), beaches, rivers, and shorelines are not addressed due to their absence within the City. This chapter focuses upon biological resources, visual and scenic resources, air quality, hydrology, geology, ridgelines and topographic resources. In addition, the element briefly addresses mineral and aggregate resources, hazards and cultural and historic resources. This chapter attempts to coordinate the City's natural resource planning efforts with other organizations involved in planning for open space. This plan has been prepared in a manner which reflects the relationship between conservation and open space and

the Land Use, Safety, and Circulation Elements of the General Plan.

This document should be considered a flexible policy guide rather than an exhaustive inventory of all natural and environmental resources within the City. Its preparation is intended to outline key conservation and open space issues and recommend effective public policy for the implementation of strategies in order to maintain a healthy natural environment which reflects a balance between human activities and natural processes.

B. DEFINITION AND CHARACTERISTICS OF OPEN SPACE AND CONSERVATION IN GLENDALE

The California Government Code defines open space as any parcel of land or water that is essentially unimproved and devoted to open space uses (as identified in Section 65560). The Government Code further characterizes open space as land for the preservation of natural resources including plants, animals and fish wildlife species. Open spaces are areas required for ecological and scientific study purposes, such as streams and watershed

lands. Open space can also be land used for the managed production of resources, which could include such things as forest lands, range lands, agricultural lands and areas of economical importance for the production of food or fiber. However, due to the urban nature and mountainous characteristics of Glendale, the use of open space for such managed production is infeasible. Open space can also be areas used for outdoor recreation including but not limited to outstanding scenic, historic and cultural venues, areas particularly suited for parks and recreational purposes, and areas which serve as links to regional recreation and open space reserves. Open space lands also include trails and scenic highway corridors, and can refer to earthquake fault zones, unstable soil areas, flood plains and areas pertaining to high fire risk that have been left undeveloped for reasons of public health and safety. Conservation pertains primarily to the reclamation, protection, regulation and management of natural resources. These resources include the water quality of streams, the erosion of soil, and the protection of water resources. In addition, conservation also pertains to the recognition of important habitats and the protection of rare and endangered species.

In the City of Glendale, open space lands are confined primarily to the San Gabriel Mountains, Verdugo Mountains and San Rafael Hills. These unique areas are comprised of undeveloped properties surrounded by intense urban development, which contain a variety of important resources and provide recreational use and for visual relief. These resources need to be considered in their regional context and association with adjoining open space reserves.



Oakmont Country Club, Private Recreational Use

C. OPEN SPACE INVENTORY

1. Publicly Owned Land

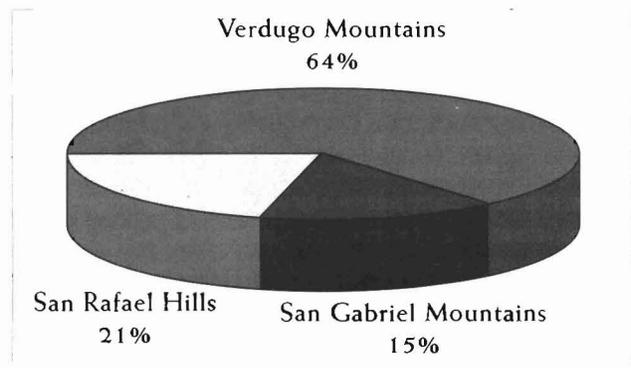
Open space properties in the City of Glendale have been acquired through various means. The majority of the open space property has been obtained by the City of

Glendale. However, other public agencies have acquired properties within the City and these areas increase Glendale's inventory of open space property. In addition, many private properties within the City are utilized for open space purposes such as golf courses, educational facilities or religious functions.

a. Acquisition History of City Owned Open Space

The City of Glendale has acquired 4,782 acres of open space since 1913. The majority of this is 3,077.95 acres in the Verdugo Mountains. In the San Rafael Hills, 1,002.73 acres were acquired and 707.77 acres were acquired in the San Gabriel Mountains. Chart 4-1 illustrates this distribution.

CHART 4-1 DISTRIBUTION OF ACQUIRED OPEN SPACE



The first property acquired was 62.20 acres in the Verdugo Mountains in 1913. In the 1920s, 598.08 acres were acquired, and all but 5.2 acres of this were part of Brand Park. No property was acquired in the 1930s. Scholl Canyon in its undeveloped state accounted for 378 acres acquired in the 1940s, as well as a portion of the Verdugo Mountains (414 acres) and another 90 acres in the San Rafael Hills. The majority of the land acquired in the 1950s was property adjacent to Brand Park (558 acres). Only 42 acres were acquired in the 1960s. There were small portions in the Verdugo Mountains and San Rafael Hills. The 1970s showed the second greatest amount of open space acquisition, with 1,081 acres. This included two large purchases in the Verdugo Mountains: Henderson Canyon (636 acres) and another addition to Brand Park (201 acres). The greatest amount of open space was acquired in the 1980s, when 1,518 acres came into City ownership. The major properties acquired are: Intervalley Ranch, now known as George Dukemejian Wilderness Park, in the San Gabriel Mountains (702 acres); Bank of Commonwealth and a portion of Henderson Canyon in the Verdugo Mountains (463 acres), and "Polygon" in the San Rafael Hills (175 acres).



In 1991, Deadhorse Canyon was purchased in the Verdugo Mountains (35 acres). Chart 4-2 shows the City's acquisition history by decade. The City has most recently (1992) purchased property in the San Rafael Hills between Buckingham Road and Figueroa Street.

Other publicly owned open space exists in the City of Glendale. The owners of such open space include the State of California Department of Transportation (CALTRANS), Los Angeles County, City of Burbank, Southern California Edison Company, and Los Angeles Flood Control District. These properties are primarily undeveloped and function as open space. Map 4-27 identifies these important properties.

b. Privately Held Open Space Properties

Privately held properties include unsubdivided land and developed recreational and educational facilities such as golf courses, youth camps, and religious retreats. Privately held property comprises a total of 1,540 acres.

D. ORGANIZATIONS INVOLVED IN PLANNING FOR OPEN SPACE

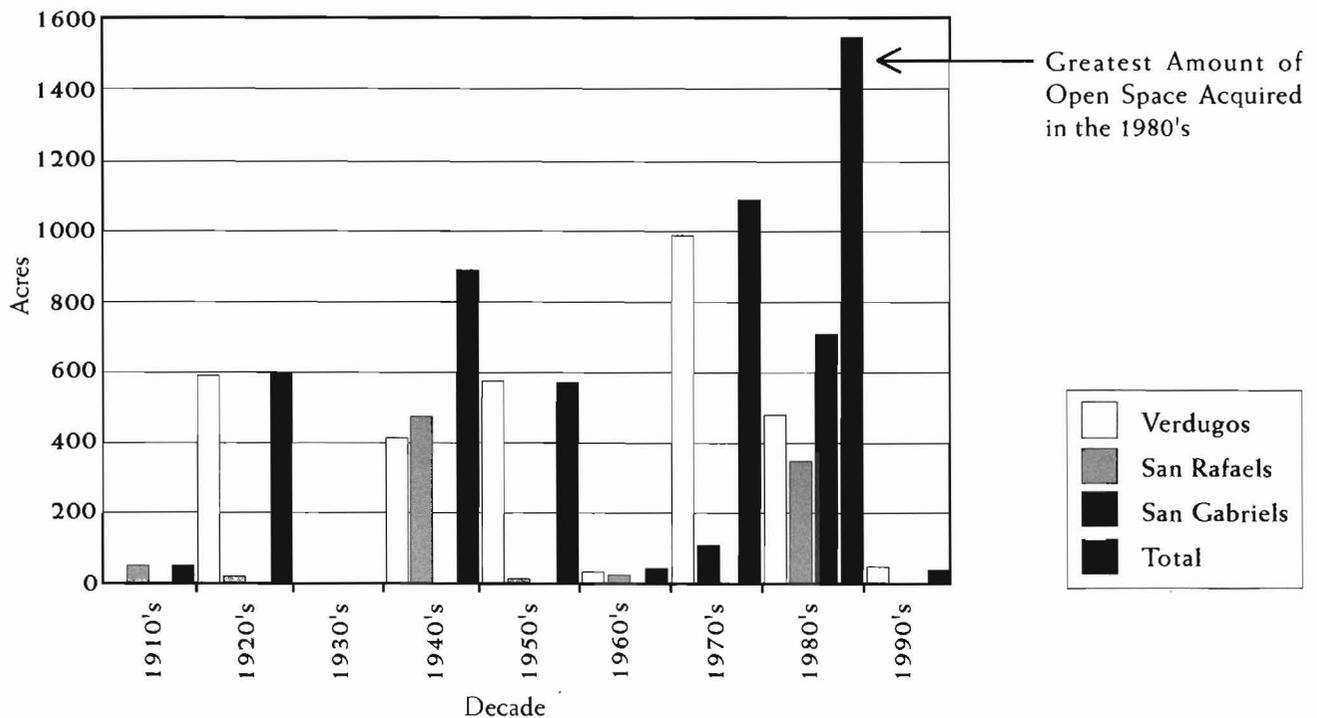
The Santa Monica Mountains Conservancy, Los Angeles County Department of Regional Planning, Small Wil-

derness Area Preservation (SWAP) and other regulatory governmental agencies are involved in the management of open space and other natural resources. It is important that these organizations and agencies be recognized in the development of open space resource planning in the City in order to coordinate management of these resources within a regional context.

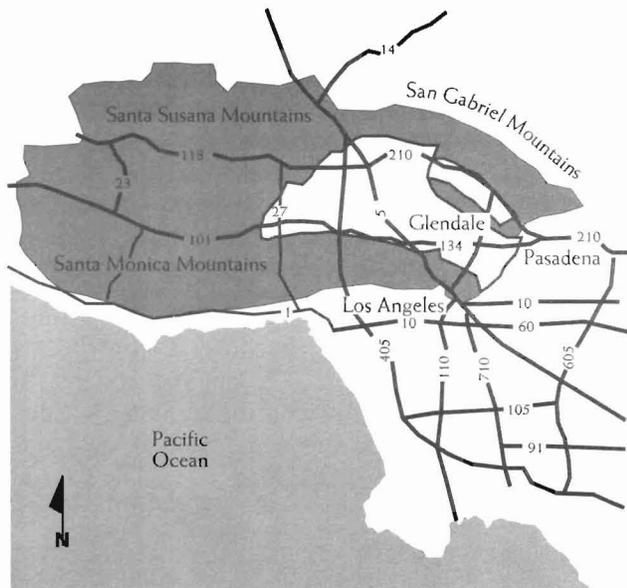
1. Santa Monica Mountains Conservancy

The Santa Monica Mountains Conservancy was established by the California Legislature in 1980 to acquire land and operate programs for conservation, recreation and park purposes in the Santa Monica Mountains Zone, which includes the Santa Monica Mountains and the Rim of the Valley Trail Corridor. The mountainous areas of the City of Glendale fall within the planning jurisdiction of the Santa Monica Mountains Conservancy's Santa Monica Mountains Zone (see Map 4-1). The City of Glendale continues to coordinate its acquisition of new and open space lands with the Santa Monica Mountains Conservancy and to seek grants for the acquisition and development of open space for recreational land. The Santa Monica Mountains Conservancy works closely with the National Park Service, the State parks system and city and county governments in Los Angeles and Ventura Counties to preserve recreational and open space lands and to further opportunities for nature education and recreation.

CHART 4-2 OPEN SPACE ACQUISITION HISTORY BY DECADE



MAP 4-1 SANTA MONICA MOUNTAINS CONSERVANCY ZONE



The Rim of the Valley Trail Corridor (Map 4-6) is a network of parks and trails connecting the Santa Monica Mountains to all the mountains surrounding the San Fernando Valley including the San Rafael Hills, Verdugo Mountains and San Gabriel Mountains. The Intervalley Ranch property forms an important link in the completion of the Rim of the Valley Trail Corridor and provides protection for significant open space resources. In addition to its direct conservation and recreational programs, the Conservancy administers more than 17,000 acres of park land located in Los Angeles and Ventura Counties and awards grants to local governments for park and recreation districts and land acquisition, access improvement, and outdoor educational programs. The City of Glendale has benefitted from the Conservancy grant program with funding for the acquisition of the Intervalley Ranch property in the San Gabriel Mountains.

2. Los Angeles County Department of Regional Planning

In the mid-1970s, the Los Angeles County Department of Regional Planning conducted a survey of the County's biological resources. In 1976, a General Plan Technical Supplement was produced which provided Special Management Areas. In 1980, this information was incorporated into the County wide General Plan which identified Special Management Areas and sixty-one Significant Ecological Areas (SEAs). The SEAs were intended to serve as a guide for prudent development within po-

tentially sensitive areas. The SEAs established boundaries which encroach into incorporated territory. A portion of one SEA is located within the City limits of Glendale—Area 40 in the Verdugo Mountains, which contains chaparral, coastal sage scrub and riparian habitats. Within the SEA Area 40, the County designates medium intensity recreational uses as the development type compatible with the identified habitat (see Map 4-13 Verdugo Mountains Significant Ecological Area (SEA)).

3. Small Wilderness Area Preservation (SWAP) - Verdugo-San Rafael Chapter

Organized in 1976, SWAP has played a significant role in increasing public awareness of the mountains as important open space assets and in the assistance of land acquisition by State and local governments. SWAP was instrumental in the acquisition of 500 acres in the Henderson Canyon area of the Verdugo Mountains. The organization also assisted in the successful preparation of grant applications from State and local sources for the acquisition of property in Glendale and in La Tuna Canyon which is located in the Los Angeles portion of the Verdugo Mountains. SWAP has coordinated land planning recommendations with the Santa Monica Mountains Conservancy which has led to the purchase of an additional 1,000 acres in the Los Angeles portion of the Verdugo Mountains. SWAP is currently active in acquisition efforts for additional acreage in the La Tuna Canyon area and Big Tujunga Wash.

As part of its ongoing open space plan efforts, SWAP prepared a proposal for a Verdugo-San Rafael Wilderness Park. The proposed park envisions an intra-urban mountain park designated for public use in perpetuity. The park would offer the combined attractions of passive and active recreation. Suitable areas are recommended for development as park land and other areas for restricted access such as trails and primitive camping sites. Preservation of prominent ridgelines and peaks are recommended as a third category of use. This use would serve a visual function of providing a backdrop for the urban environment.

E. CONNECTORS

1. Paths and Trails

The California Public Resources Code requires every City to consider demands for trail oriented recreational use and consider such demands in developing specific open space programs. Each City is also required to identify the feasibility of integrating City and County trail routes with appropriate segments of the California Recreational Trails System. Since none of the trail systems



Whiting Woods Trailhead Entrance

within the City of Glendale connect with any trails identified in the California Recreational Trails System, this aspect is not discussed. Emphasis is placed on the local and regional systems.

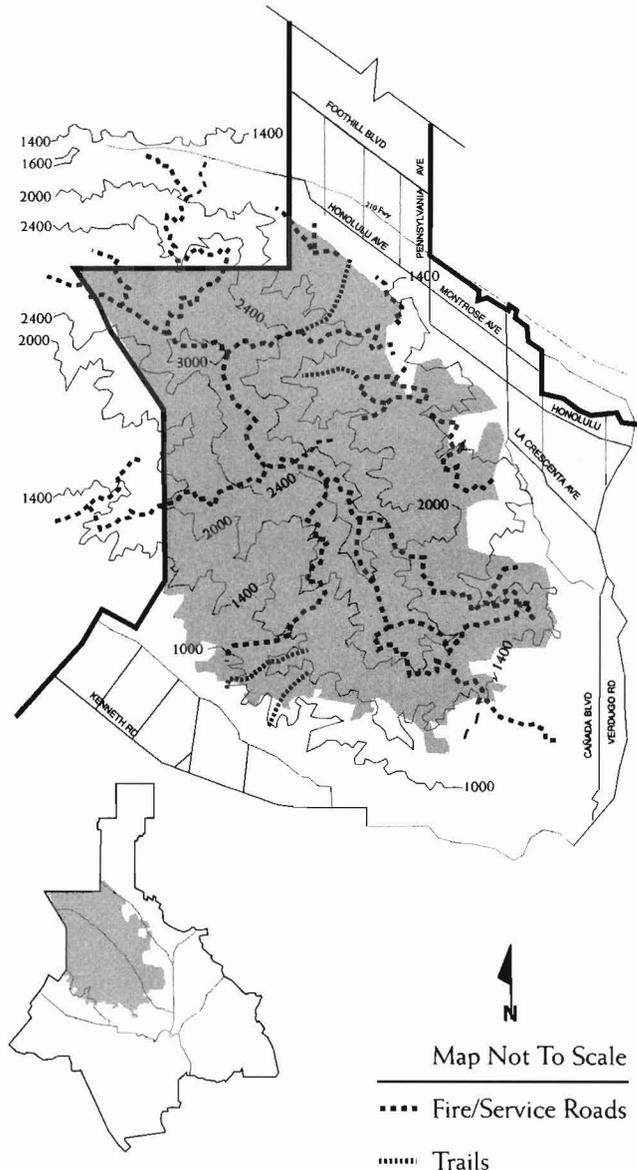
Trails form an important part of the City's overall open space plan in that they provide access to open space lands and serve as an active recreational amenity. Trails can be utilized for hiking, bike riding and equestrian uses. It is important that trails provide linkages to other open space areas and that they are integrated with other trails so that the overall system can be a continuous one of parks, trails and areas of preserved wildlife habitats that thereby provide maximum opportunity for recreation. It is also important to recognize that direct public access should only be established for those areas that can safely withstand human activities and to evaluate the compatibility of the various potential uses.

a. Verdugo Mountains

Because of the high fire hazard posed by the native vegetation in the Verdugo Mountains, a series of fire roads were established in the 1930's. These provide access to the mountainous areas in order to minimize the threat of fire to the surrounding urban areas. This network of wide, smooth fire roads provides a well developed system of interconnecting trails for the Verdugo Mountains. Map 4-2 identifies paths and trails in the Verdugo Mountains. The trail system is composed of the Verdugo, Brand Park, Beaudry North, Beaudry South, Whiting Woods, Skyline and Hostetter Fire Road Trails. The most popular hiking trails include those on the north facing slope of the mountain range including Beaudry and Hostetter. Whiting Woods, due to its steepness, is utilized less than the other trail systems. Within the Verdugo Mountains these roadways serve as a desirable trail system for mountain bike activity. These trails connect to similar systems in the City of Burbank and also connect to those in the City of Los Angeles as shown on

Map 4-3. The Santa Monica Mountains Conservancy has recently constructed the La Tuna Canyon Trail which connects to the Verdugo fire road trail just outside the City of Glendale. Because of this trail development, it is now possible to travel in the Verdugo Mountains on several loop trails. In a recent publication titled Afoot and Afield in Los Angeles County, the Beaudry Fire Road System is noted as a unique loop trail. Also noted is a west side loop utilizing the recently constructed La Tuna Canyon Trail. The views from these trails are spectacular particularly on any cloud-free, smog-free day. The trail systems are accessible by foot, horse or mountain bike, although there is no equestrian access from the Glendale area into the Verdugo Mountains.

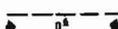
MAP 4-2 PATHS AND TRAILS OF THE VERDUGO MOUNTAINS



MAP 4-3

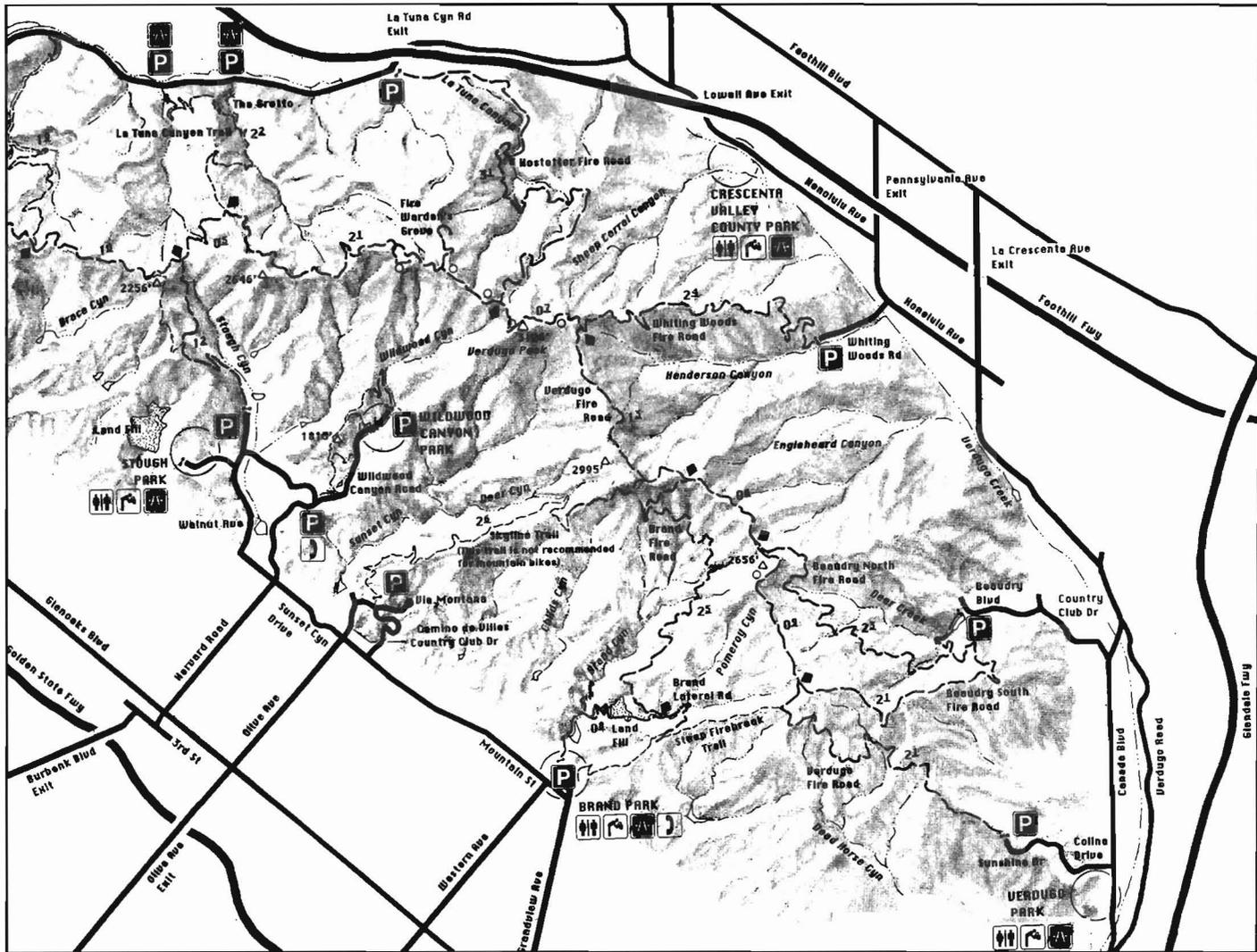
MOUNTAIN BIKE AND HIKING TRAILS OF THE VERDUGO MOUNTAINS
 GLENDALE, BURBANK AND LOS ANGELES, CALIFORNIA

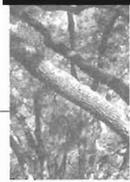
LEGEND

-  Freeways
-  Streets
-  Fire Roads or roads with limited access. Distance between marks in miles and tenths.
-  Trails
-  Locked Gate -- no unauthorized motor vehicles
-  Summit -- elevation in feet
-  Debris Basin & Intermittent Stream
-  Trailhead Parking
-  Restrooms
-  Water
-  Electronic Tower
-  Picnic
-  Phone

Source:

Cartography by Don Cambell with help from the planning departments of the cities of Glendale, Burbank and Los Angeles. Valuable contributions were also made by Instructors and fellow students at California State University, Northridge; and by the Santa Monica Mountain Conservancy.





The only fully developed trailhead for the Verdugos is found in Brand Park. Other trailheads have been established but these only provide for parking facilities. There are numerous other small trail systems in the Verdugo Mountains which have been improved by the Southern California Edison Company for access to their individual towers. However, these trail systems are relatively short and do not connect to major trail systems. Consideration should be given to establishing a new trail system to connect Crescenta Valley Park to the fire road system (via the Whiting Woods Trail) and/or to develop more trailhead facilities for utilization of these trails. Public transportation is provided close to Crescenta Valley Park, thereby providing a greater opportunity for public access to the open space lands.

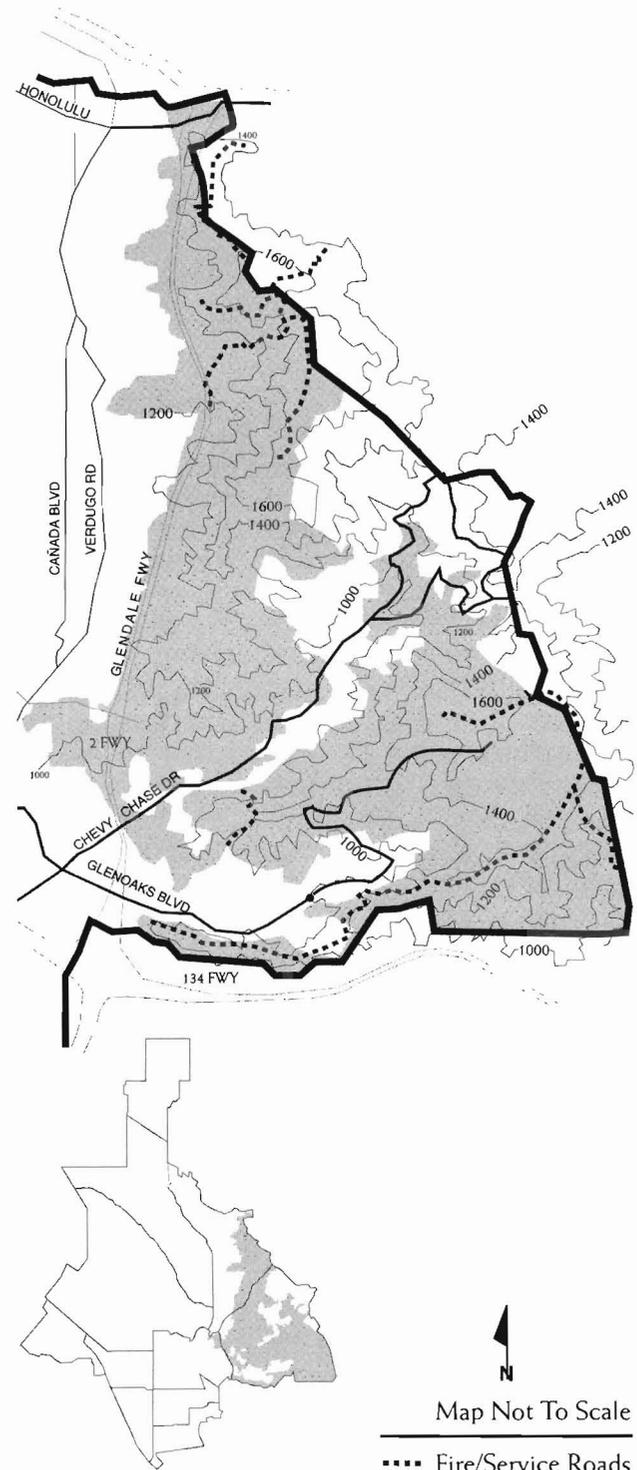
b. San Rafael Hills

Like the Verdugo Mountains, a series of fire roadways were developed in the early 1930's to provide for fire access. Unlike the Verdugo Mountains, however, the San Rafael Hills have undergone a greater amount of development. As a result, many of these fire roads have been bisected and do not serve as major hiking trails in this area. Furthermore, due to the recent development of the San Rafael Hills Estates project, a paved roadway (Camino San Rafael) has been developed from the Glendale Freeway to Emerald Isle Drive. Access to the open space areas in the San Rafael Hills is still available along this roadway to the ridge motor way which provides access to the Cerro Negro lookout tower and along the La Canada-Flintridge border to Cherry Canyon north of Descanso Gardens. Several laterals from this ridge route are available with access under the 2 Freeway at Fern Lane. The trail system in the San Rafael Hills is much smaller in scale and not as well utilized as the system in the Verdugo Mountains. The Cherry Canyon Trail connects to the equestrian trails of La Canada Flintridge and ultimately to the San Gabriel Mountains. Map 4-4 shows trails in the San Rafael Hills.

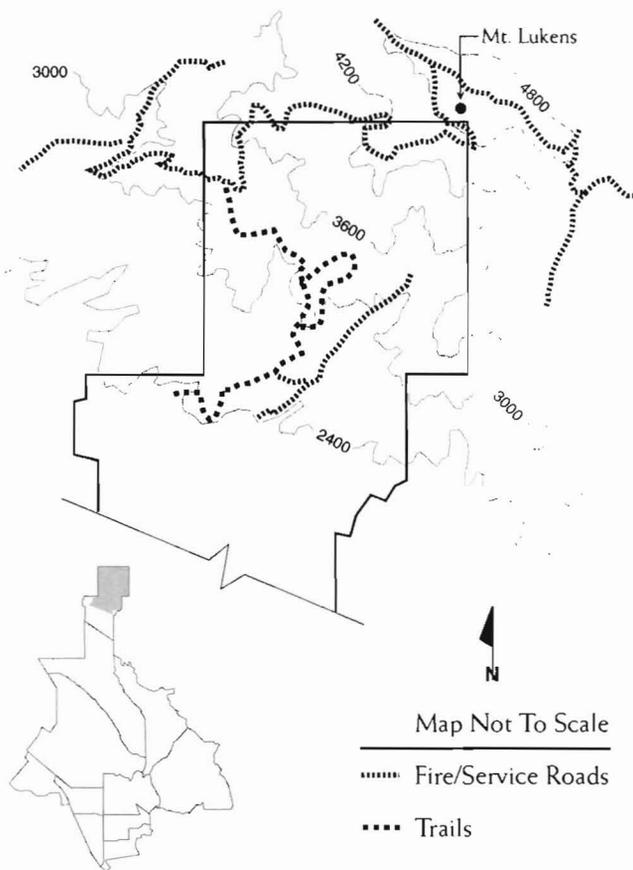
c. San Gabriel Mountains

With the recent purchase of the Deukmejian Wilderness Park, the City of Glendale has provided public access to the San Gabriel Mountains. Proposed development of this facility includes an interpretive center and other activities which will provide for a developed trailhead system to the open space lands (see Map 4-5). The San Gabriel Mountains, in this portion of the range, are extremely precipitous, thereby making hiking quite difficult in the upper reaches of the canyon areas. The Mount Lukens Trail traverses the upper portion of Glendale's corporate boundary and provides a connection to Haines Canyon Trail and Stone Canyon Trail, which ultimately

MAP 4-4 PATHS AND TRAILS OF THE SAN RAFAEL HILLS



MAP 4-5 PATHS AND TRAILS OF THE SAN GABRIEL MOUNTAINS



provide a connection to various trails in the Angeles National Forest (Tujunga district). Connection through Big Tujunga Canyon can be made to the Pacific Crest Trail which is located approximately nine miles north of the City boundary. Due to the steep topography of the San Gabriel Mountains, the development of a trail system would appear to be limited to the lower elevations. Although there may be potential conflicts regarding safety among hikers, equestrians and mountain bike riders, the needs and compatibility of these three groups should be considered in trail design.

d. Rim of the Valley Trail Corridor

In 1983, the California State Legislature recognized the natural and recreational value of the greenbelt surrounding the San Fernando and La Crescenta Valleys by expanding the role of the Santa Monica Mountains Conservancy to plan and develop trails for open space in the Rim of the Valley greenbelt. The Rim of the Valley Corridor is an interlocking system of hiking and equestrian trails that connects parks and open space in the San Fernando and La Crescenta Valleys (see Map 4-6). Its primary purpose is to provide public access to the

outdoor preserves of the Los Angeles area. The Rim of the Valley Trail Corridor does not specifically include the Verdugo Mountains or San Rafael Hills as the primary route. It does recognize the Mount Lukens Trail which passes through the upper portion of the City of Glendale. It is recognized, however, that all trails are important within this area and that their continuity with and connection to other trail systems are important. The Santa Monica Mountains Conservancy recognizes the significance of connectors to this system which traverses Glendale's mountainous area. Development of improved trailheads in order to provide greater access to the public are among the desired goals and objectives of the Santa Monica Mountains Conservancy.

e. Trail Improvements

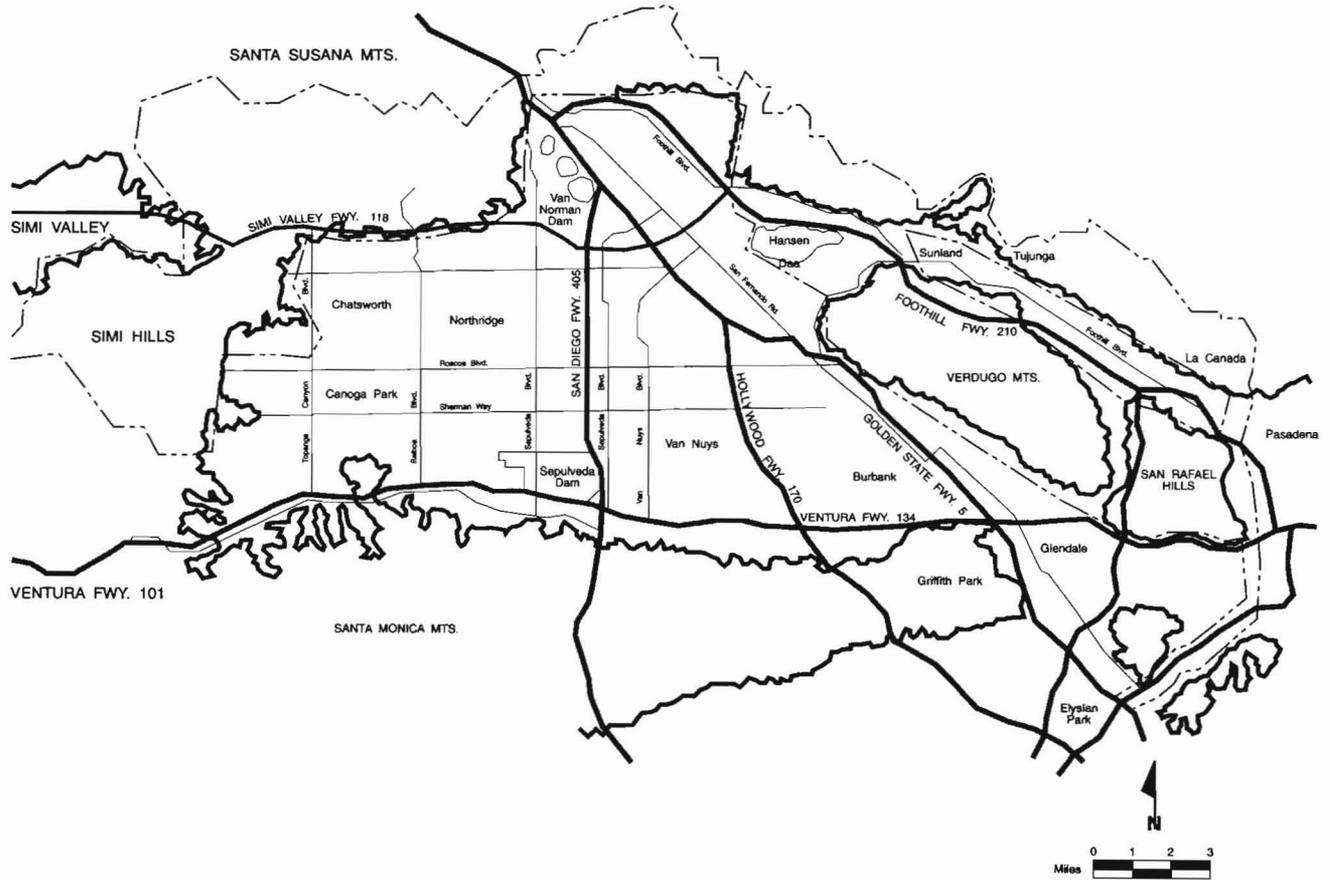
Glendale's trail system should be constructed in a manner that can accommodate hikers, joggers, equestrians and bicyclists as well as individuals with disabilities (where applicable) but still preserve open space values and natural resources. The trail alignment should follow existing paths and natural contours as much as possible. Trailheads or staging areas should be developed to provide adequate services (parking, water, restrooms, picnic facilities), without infringing upon residential neighborhoods or large areas of open space land. The trail system should accommodate a varying degree of difficulty for the hiker. Emphasis should be placed upon existing park facilities as the primary access points to open space lands. Access to public transportation should be considered a desirable design element in developing trailhead facilities. Signs should also be provided only for visitor information, safety and resource protection. Visitor information kiosks utilizing natural earth-tone colors could aid in dissemination of educational information for those using Glendale's natural resources.

2. Urban Hikeway

In addition to the trail system which has been developed for the open space lands of the City, the City has identified several urban hikeways in an effort to provide an opportunity for citizens and visitors to discover Glendale's unique urban form. Three self-guided routes have been established (see Map 4-7), each of which is easily accessible by public transportation. All routes have conveniently located restrooms and provide areas where the urban hiker can sit back and observe the sights of the city and its people. This urban trail system is intended to highlight three of Glendale's unique centers including the Financial/Fremont Park route, Brand Shopping route, and the historic Civic Center route. These routes vary in length between two and three miles and are either developed or proposed to be developed with



MAP 4-6 RIM OF THE VALLEY CORRIDOR



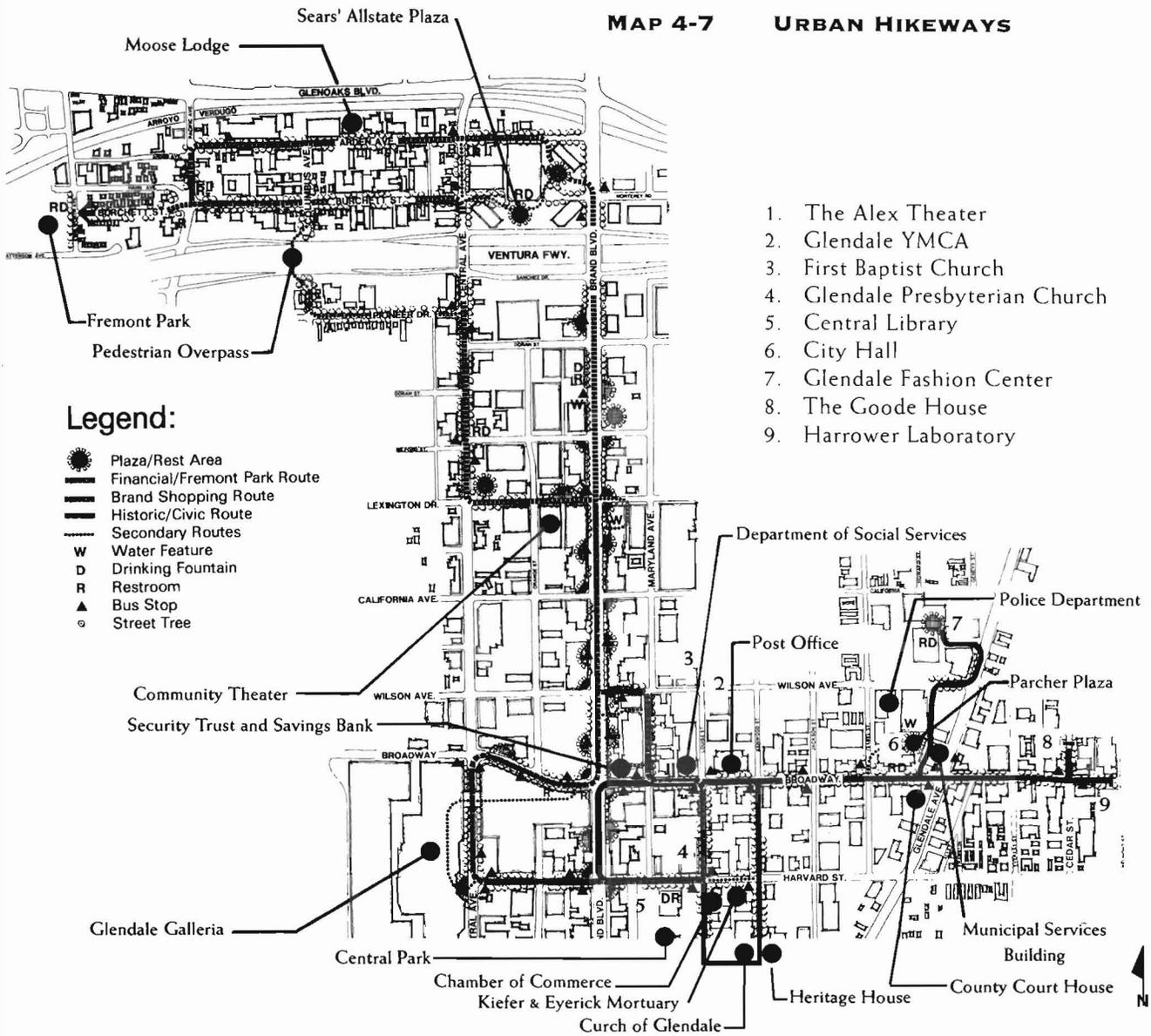
A Part of Glendale's Urban Hikerway Along Brand Boulevard

interesting streetscape features to encourage pedestrian usage. These routes, similar to the other trail systems, are intended to provide connection between activity centers.

3. Bikeways and Scenic Roadways

The Scenic Highways Element has been developed in concert with the Circulation Element of the General Plan and provides for discussion of bikeways and scenic roadways. Map 4-8 identifies Glendale's existing and proposed bikeway routes. The City is in the process of updating its Circulation Element and bikeway plans. Coordination of transportation facilities to important trailheads for the linkage of mountain bike trails to existing and proposed bikeways is recommended.

MAP 4-7 URBAN HIKEWAYS



1. The Alex Theater
2. Glendale YMCA
3. First Baptist Church
4. Glendale Presbyterian Church
5. Central Library
6. City Hall
7. Glendale Fashion Center
8. The Goode House
9. Harrower Laboratory

F. IDENTIFICATION AND EVALUATION OF RESOURCES

1. Air Quality

In addition to its required topics, the Conservation Element may address the protection or improvement of air quality. The following is a synopsis of air quality issues facing Glendale. A separate Air Quality Element has been developed to address air quality issues in detail.

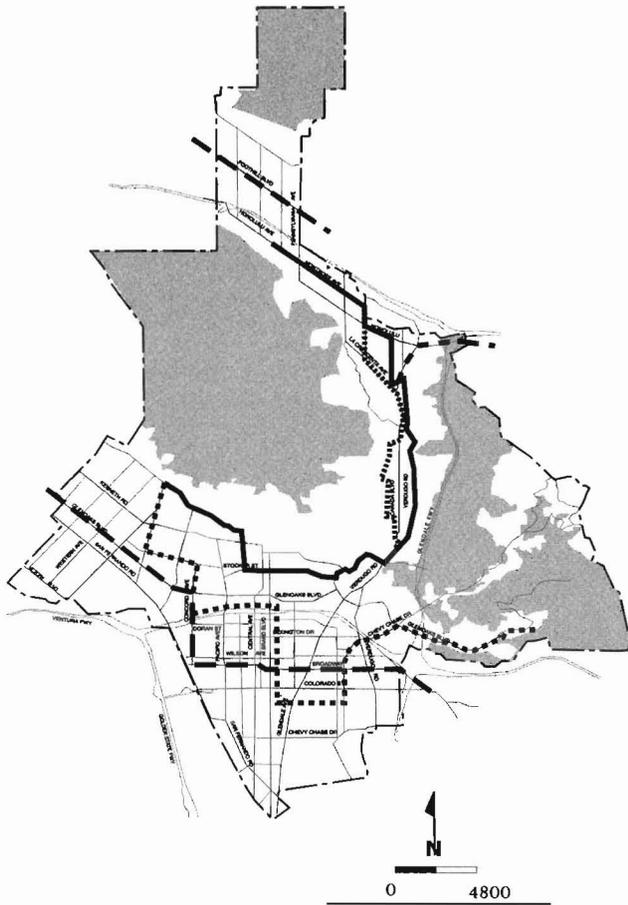
Air pollution is characterized by natural and introduced contaminants in the air which, when concentrated, adversely affect human health, animal health, plant growth, and building material longevity. The main air contami-

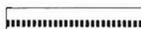
nants found in an urban setting include carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, sulfates and lead. All of these contaminants except ozone are directly emitted from fuel combustion. Ozone is created when certain organic gases are combined with nitrogen dioxide in sunlight. Other pollutants include toxic air contaminants which pose either an acute (short-term exposure) or chronic (long-term exposure) health risk when concentrated. Toxic air contaminants are often released as a result of an industrial accident or improper safety equipment.

Daily air emissions generally remain in the air basin in which they are emitted, usually a geographical region bounded by mountains. Over a longer period, they are



MAP 4-8 EXISTING AND PROPOSED BIKEWAYS



-  Proposed City Designated Route
-  Proposed County Designated Route
-  Existing Route
-  Modifications to Existing Route

dispersed throughout the atmosphere. Glendale is located in the South Coast Air Basin which is composed of the non-desert portions of Los Angeles, San Bernardino and Riverside County, and all of Orange County. As early as the 1940s and 1950s, the Basin began to experience significant air pollution from rapid industrial, population and traffic growth. Ever since, the South Coast Air Basin has been plagued by some of the worst air quality in the country. Light winds, poor vertical mixing, abundant sunshine and surrounding mountains help create the ideal conditions for air pollution. Today, the South Coast Air Basin exceeds federal ambient air quality standards more frequently than any other area in the country.

Air quality in the Basin is regulated at the federal, state and regional level. The following air quality regulations from different government levels affect Glendale.

a. Federal Clean Air Act

The Clean Air Act is the federal law that provides for protection of air quality in the United States. With the exception of abatement of nuisances, essentially all federal, state and local air pollution programs derive directly or indirectly from the Clean Air Act. The Federal Clean Air Act (FCAA) Amendments of 1977 stated that a designated agency in each region of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that would bring the area into compliance with all national standards by December 31, 1987. However, since 1977, additional knowledge and concerns about air quality and exposure to air pollutants have led to substantive amendments. In addition, regions designated as nonattainment were not meeting original compliance standards. For example, the South Coast Air Basin (SCAB) could not meet the attainment deadline for ozone, nitrogen dioxide, carbon monoxide, or particulates.

As a result, the 1990 amendments to the FCAA take the concept of nonattainment areas to a new level of complexity. Congress enacted amendments to the FCAA in October, 1990 which divided the country into five categories of ozone nonattainment areas, ranging from marginal to extreme. Deadlines were based on the severity of the local air pollution problem, ranging from three to 20 years for areas with extremely polluted air. The only section of the country designated "extreme" is the SCAB. Although there is a longer deadline to attain these standards, there are also much stricter control requirements, including offsetting all increases from existing stationary sources, enacting transportation control measures and requiring the use of clean or reformulated fuels. In addition to ozone and carbon monoxide, the FCAA mandates attainment requirements for inhalable particulates (PM10) and nitrogen oxides.

b. California Clean Air Act

In 1988, the California Legislature enacted the California Clean Air Act (CCAA). The CCAA amended the enabling authority for air pollution control districts in the state. The legislature gave these districts, including the South Coast Air Quality Management District (SCAQMD), broad new authority to regulate motor vehicle use with indirect source controls (restrictions on land uses which pollute the air principally through their trip generation) in areas that have not met national or state ambient air quality standards.

The CCAA requires that regional emissions be reduced by five percent annually, averaged over three year periods until attainment is demonstrated. Each area that does not currently meet a national or state ambient air quality standard is required to prepare a plan which demonstrates how reductions will be achieved. Areas with the most heavily degraded air quality are required to reduce emissions 50 percent from 1987 levels by December 31, 2000. Plans must be updated in 1998 if attainment cannot be demonstrated by the year 2000.

c. Air Quality Management Plan of 1991

The SCAQMD adopted the 1991 Air Quality Management Plan (AQMP) to meet CCAA requirements. Although the 1991 AQMP defers the attainment date to 2010, consistent with the 1990 FCAA, it contains fewer Tier III (new technology) control measures than the previous 1989 AQMP, relying on the adoption of new motor vehicle controls by the state which, by the year 2003, will result in cars that are 80 percent cleaner than those sold in 1990. The state control program calls for 10 percent of new vehicles to be electrified by 2003, the 1991 AQMP expands this goal to 50 percent.

The 1991 AQMP also shifts the emphasis from jobs-housing balance (land use policies which are intended to reduce traffic by bringing home and work locations closer together) to equivalent reductions in vehicle miles traveled (VMT). It continues to recommend adoption of Air Quality Elements or Plans as the basis for implementing many of the local government measures, but defers the date for adoption to January, 1993. A variety of options, including jobs-housing balance, can be utilized by local governments to achieve the VMT reductions attributed to growth management. These must be in addition to other measures already required by the plan. In response to the call for local government to regulate certain air quality issues, the City of Glendale, in 1991, joined 15 cities in the West San Gabriel Valley to develop a subregional air quality plan. This plan has identified practical measures from which each city can choose in order to meet the requirements of the 1991 AQMP. The City of Glendale will be using this plan as a base for developing an Air Quality Element as part of its comprehensive General Plan.

2. Archaeological, Paleontological, and Historical Resources

Discoveries of ancient human, animal, and plant remains may provide an important record of life in this area. Historic records and artifacts provide a sense of how this community started and developed culturally as well as physically. These elements provide a sense of continu-

ity for the present and a base from which to plan for the future.

a. Archaeological Resources

In southern California, archaeological finds (remnants of human life and culture in past ages) are usually associated with water sources. Water, quite literally, provided the "life blood" of ancient communities—water for drinking, cooking, farming, and attraction for hunted prey, etc.

Perennial and intermittent watercourses have existed in Glendale through the ages. However, no archaeological sites have been documented. An archival search conducted in February, 1991 has substantiated this conclusion. Sources consulted were the University of California at Los Angeles Archaeological Information Center, the National Register of Historic Places, California Historical Landmarks listing, and all known cultural resource surveys and excavation reports for the Glendale area. Although nineteen archaeological surveys had been completed for projects in the hillside areas of Glendale, no significant archaeological sites have been identified.

This should not be construed as evidence that ancient man did not inhabit this area. Rather, investigation continues, on an individual project basis, through the environmental documentation process. Furthermore, hard surface development over archaeological resources may preserve them for future study. Sites which have not been destroyed or disturbed in past construction may be protected in this way.

b. Paleontological Resources

Paleontological resources, which are the fossilized forms of ancient plant and animal life, are generally found within sedimentary rock formations. Much of Glendale is underlain by igneous and metamorphic rock. The Repetto Hills (Adams Hill area), however, are an area of sedimentary rock deposits.

Adams Hill was one of the first parts of the City to experience development pressure. Because building took place at a time when there was not a keen interest in paleontology, it may be assumed that any unearthed deposits were either removed or destroyed. If any deposits remain they may be preserved by virtue of the hard building and road surfaces above them.

c. Historic Resources

Glendale is firmly committed to identifying and protecting its historic resources. This commitment is demon-



strated in the goals presented in the Historic Preservation Element of this General Plan, which was adopted in 1977:

- Preservation of Glendale's historic sites so that they may be part of the consciousness of present and future generations;
- Preservation of sufficient historic resources in number and type so as to successfully evoke the distinctive character of the significant stages of Glendale's history; and,
- Effectuation of a preservation program that maximizes, insofar as practicable, the effective utilization of the City's significant historic sites.

Currently, the Historic Preservation Element lists 33 significant sites. As part of the dynamic character of the general plan process, this element will experience a continuing update beginning in 1993.

The City is at the forefront of the local preservation movement. It was the first municipality in Los Angeles County to adopt an ordinance which enables owners of qualified historic properties to receive a reduction in their property tax assessment. Such savings must be applied to maintenance, rehabilitation, or restoration as specified in a binding contract. Codification of this program enacted the provisions of the "Mills Act," state enabling legislation passed in 1976.

Local preservation efforts are enhanced through the actions of the Historic Preservation Commission. This body is advisory to the City Council and reviews and makes recommendations on alterations, modifications, and demolitions of all designated historic sites.

City ownership of various historic resources protects their future in perpetuity. These include: El Miradero, the Doctor's House, Miss American Green Cross, the former Southern Pacific Railroad Depot, the Verdugo Adobe, the Casa Adobe de San Rafael, the Alex Theatre, the Goode House, and Deukmejian Wilderness Park (Inter-Valley Ranch). The Casa Adobe de San Rafael is a designated State Historical Landmark. The Glendale Post Office, the Verdugo Adobe, and the Derby House (a Lloyd Wright designed residence) are listed in the National Register of Historic Places, which is maintained for the U.S. Secretary of the Interior by the National Park Service. National Register eligibility has been determined for other sites within the City; nomination and listing on the Register is sought as an ongoing policy.

The Glendale Oral History Program further contributes to local efforts in historic preservation. Interviews with long-time residents, as well as community and political leaders, establishes a unique recorded history of the City. Furthermore, these personal accounts may assist in identifying additional or previously unknown historic resources.

Participation in state and federal historic preservation programs also aid in protecting the historic resources of the community. As a Certified Local Government (CLG), Glendale is able to compete for federal Historic Preservation Funds which are administered and distributed by the State Office of Historic Preservation (SOHP).

City involvement as well as non-profit and volunteer participation ensures the success of historic resource conservation in Glendale.

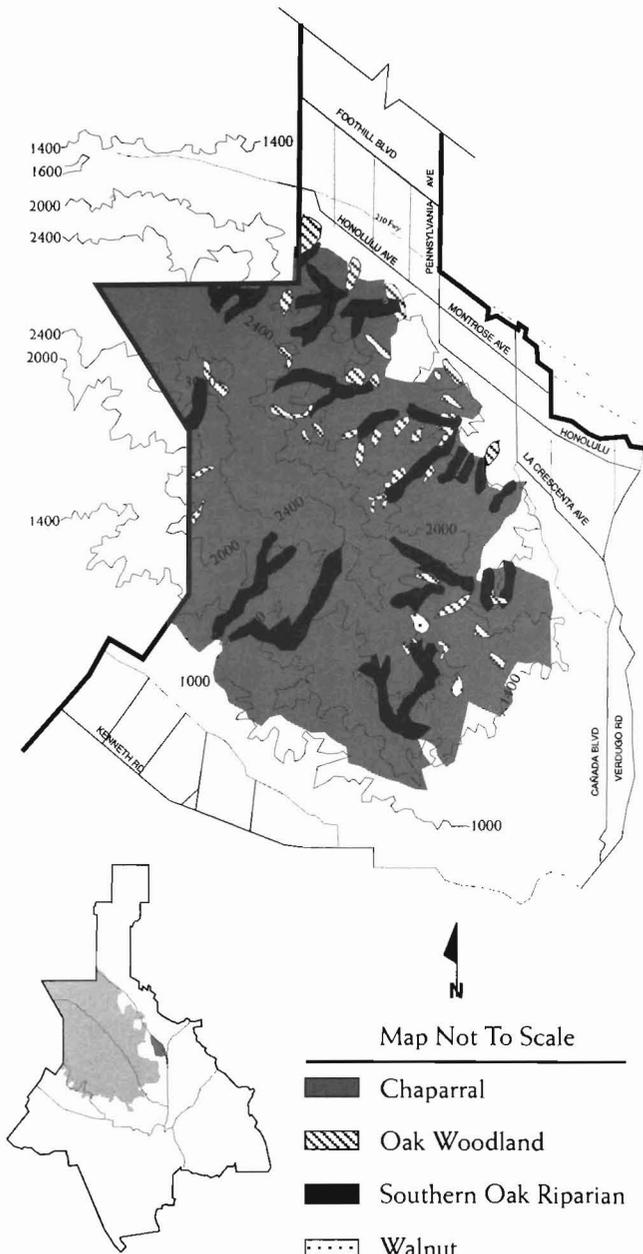
3. Biological Resources

a. Introduction

A survey of publicly owned and un-subdivided privately held parcels in the San Rafael Hills, Verdugo Mountains, and the portion of the San Gabriel Mountains located within the City of Glendale was conducted by biologist Cheryl Swift, Ph.D, in order to characterize the vegetation and the habitat value of open space in the City of Glendale. In order to adequately assess these characteristics, the vegetation of the Verdugo Mountains, San Rafael Hills and the portion of the San Gabriel Mountains within the City of Glendale was mapped, (see Maps 4-9, 4-10, 4-11) and a list of the characteristic species found in each identified vegetation type was developed. This is not a complete survey of all species in the areas previously mentioned. Instead it is an overview of the biological resources identified within these areas.

Also discussed in this section is information on the open space areas within Glendale identified by the California Department of Fish and Game Natural Diversity Data Base and the Los Angeles County Department of Regional Planning "Significant Ecological Area" (SEA) program (see Map 4-12). The Natural Diversity Data Base and the SEA program analyze biotic resources and identify areas with sensitive plant and animal communities. In some cases, these areas overlap with one another and with those areas identified by Swift in her biological assessment. Map 4-13, "Southern Oak Riparian Forest," shows the findings of the Natural Diversity Data Base, and Map 4-12 illustrates the locations of Glendale's Significant Ecological Area (SEA).

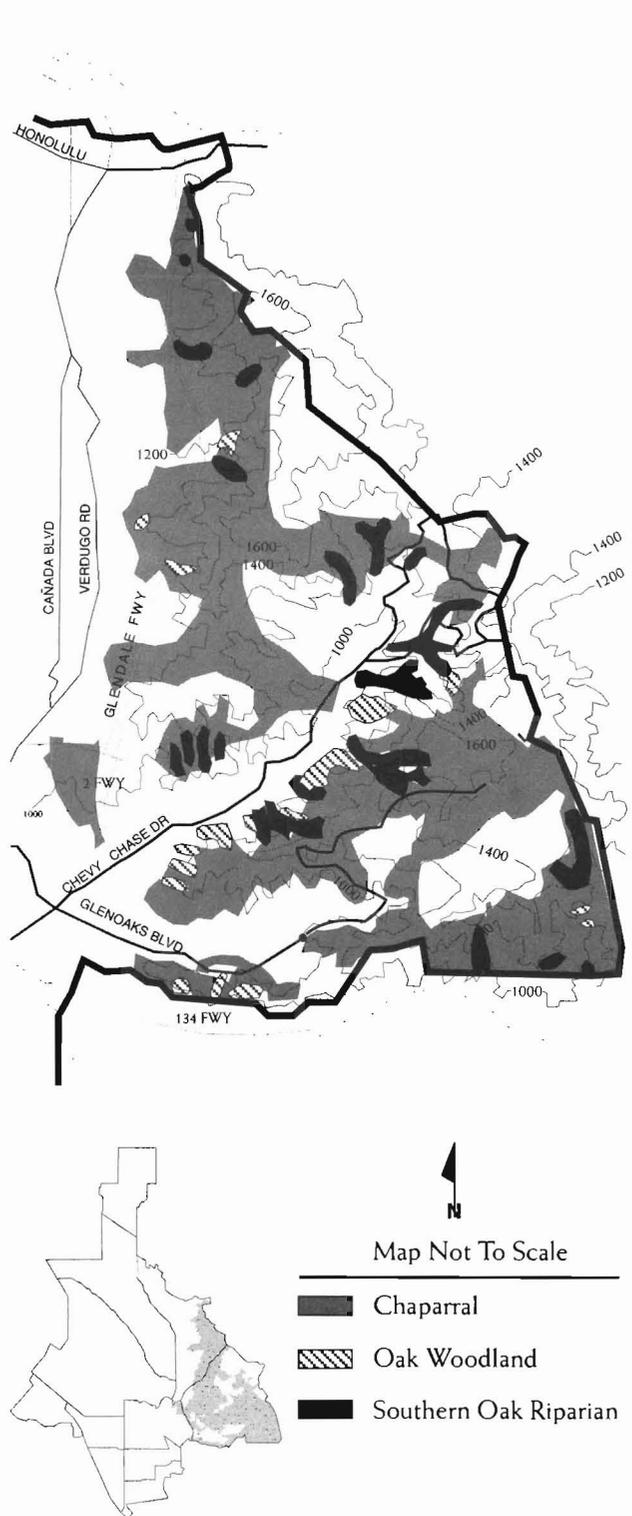
MAP 4-9 VEGETATION COMMUNITIES OF THE VERDUGO MOUNTAINS



b. Existing Conditions

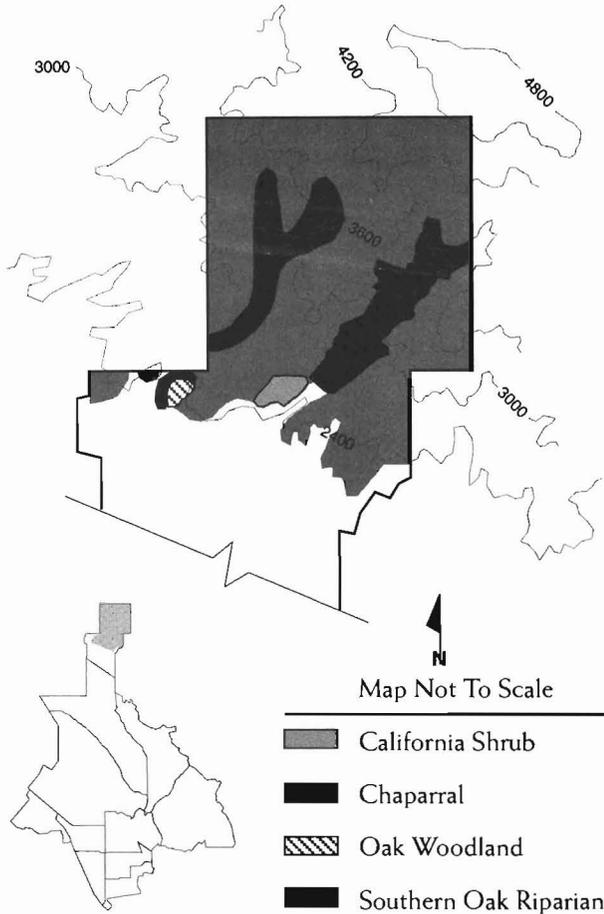
The open space within the City of Glendale is characterized as a series of drainages supporting trees within a matrix of chaparral. The areas studied support five recognizable plant communities (Holland, 1986). They include the chaparral, southern oak woodland, southern oak riparian woodland, coastal sage and alluvial scrub communities. Maps 4-9, 4-10, 4-11 show the vegetation communities present in the Verdugo Mountains, the San Rafael Hills and the San Gabriel Mountains. In

MAP 4-10 VEGETATION COMMUNITIES OF THE SAN RAFAEL HILLS

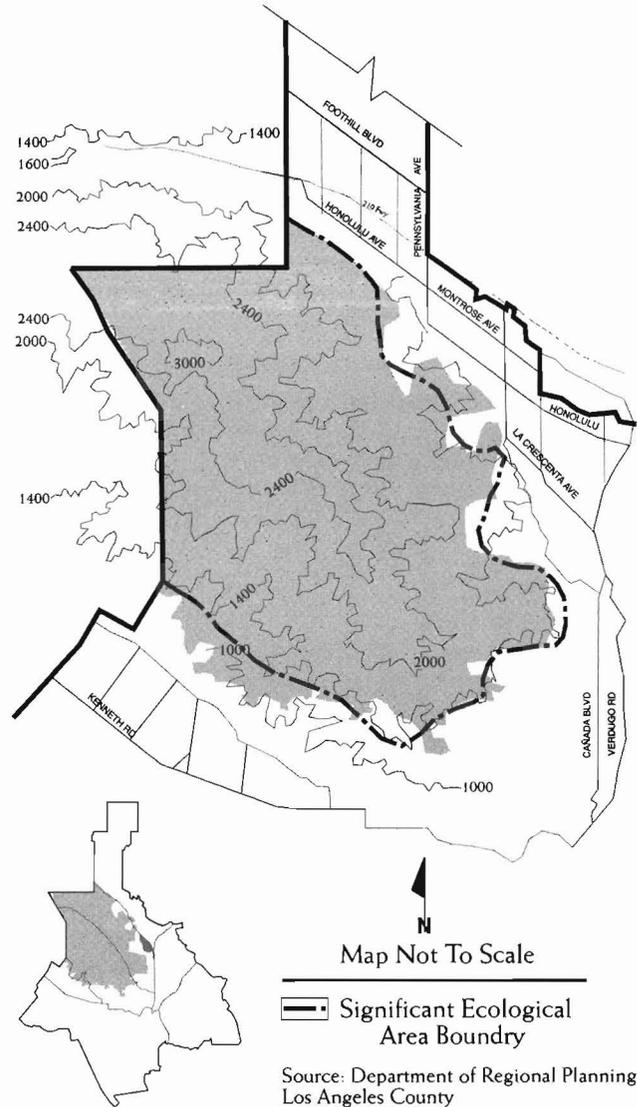




MAP 4-11 VEGETATION COMMUNITIES OF THE SAN GABRIEL MOUNTAINS



MAP 4-12 VERDUGO MOUNTAINS SIGNIFICANT ECOLOGICAL AREAS



addition, isolated patches of two additional plant communities were identified. These are walnut woodland and big cone spruce. The chaparral plant community covers the ridges and the upper slopes of ridges in all of the areas studied. Table 4-1 provides a summary of vegetation types organized by region.

1. Native Plant Communities

a. Chaparral

This community is characterized by shrubs which typically have small thick leaves and deep roots. A number of these shrub species have evolved under a selection process that includes periodic fires. As a result, a number of species are dependent on fire for regeneration by seed (Keeley and Keeley, 1989). The remaining chaparral species regenerate by one of two means. The first is a combination of seedlings and resprouting, an example

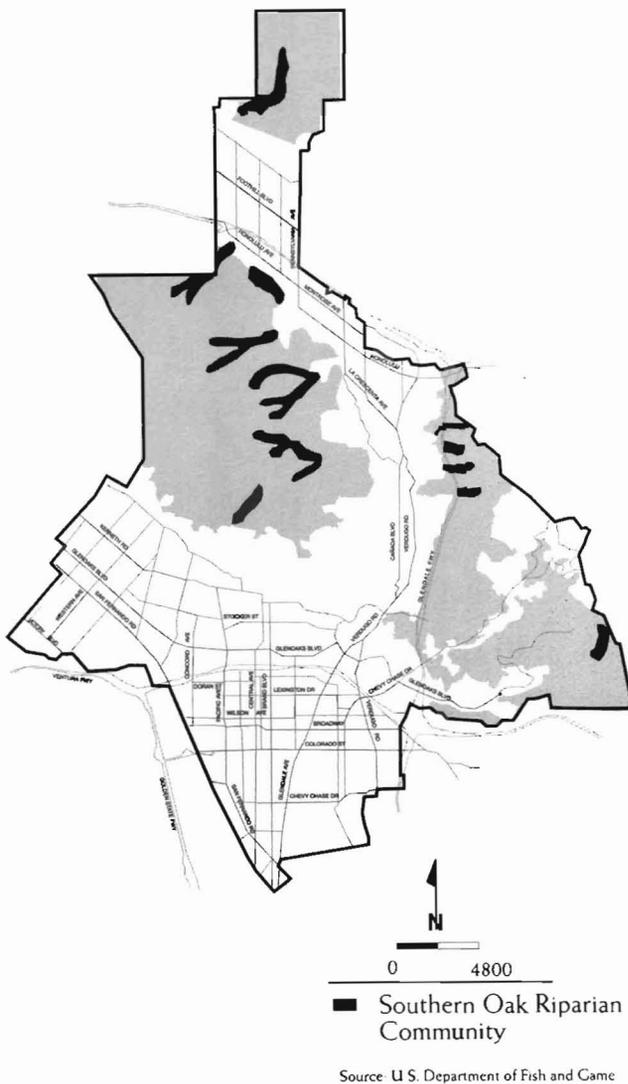


An Example of the Chaparral Plant Community in the Verdugo Mountains

TABLE 4-1 SUMMARY OF VEGETATION TYPES BY REGION

Area	% Total Chaparral	% Total Oak Woodland	% Total Southern Oak Riparian	% Total Coastal Sabe	% Total Alluvial Scrub	% Total Walnut Woodland	% Total Other
San Rafael Hills	37	22	26	0	0	0	83 (Disturbed)
Verdugo Mountains	62	78	74	50	0	0	0
San Gabriel Mountains	1	0	0	50	100	0	18 (Pseudostuga)

MAP 4-13 SOUTHERN OAK RIPARIAN FOREST



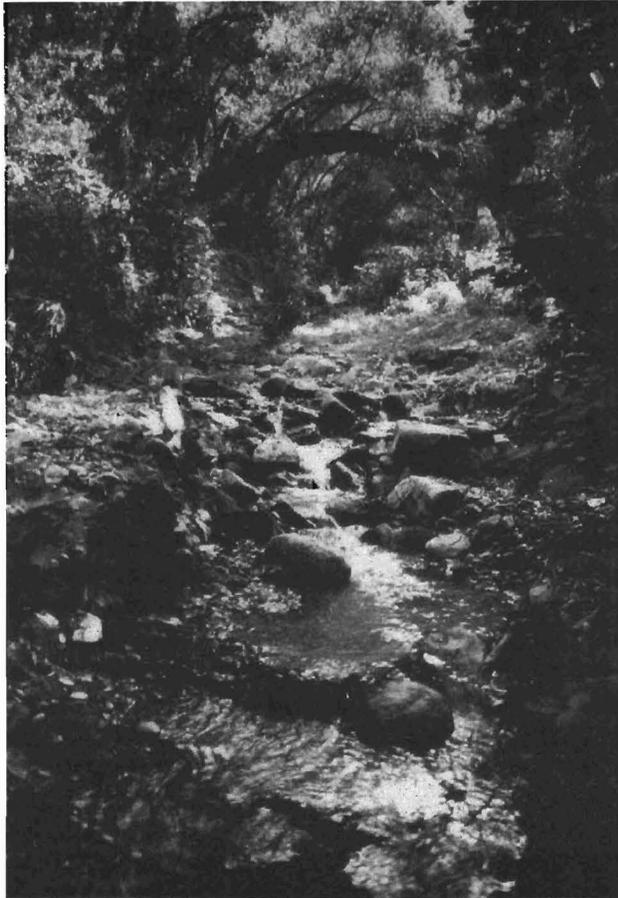
of which is observed in chamise (*Adenostoma fasciculatum*). The second regeneration strategy relies solely on resprouting. Species such as toyon (*Heteromeles arbutifolia*), holly-leaved cherry (*Prunus ilicifolia*), and buckthorn (*Rhamnus* sp.) use the second method and are usually restricted to northern or western exposures where water availability is increased relative to eastern or southern exposures. These species also occur in oak woodland understory. Chaparral covers the ridges and upper slopes of ridges in all areas studied.

b. Southern Oak Woodland

This community is named for the dominant species, the coast live oak (*Quercus agrifolia*). The understory of this community generally supports a number of annual species such as miner's lettuce (*Claytonia perfoliata*) and baby blue eyes (*Nama* sp.). In addition, bentgrass (*Agrostis stolonifera*) along with a number of introduced annual grasses occur in this community. Shrub species include those mentioned above in the chaparral community along with heart-leaved penstemon (*Keckiella cordifolia*). Southern oak woodland borders the uplands of drainages and in the San Rafels and the Verdugos and often forms large expanses on north facing slopes. This community is perceived to be in decline in Los Angeles County largely due to urban expansion. Oak trees are protected by city ordinance.

c. Southern Oak Riparian Woodland

Southern oak woodland gives way to this community when water availability increases. In addition to coast live oaks, sycamores (*Platanus racemosa*), willows (*Salix* sp.), and mulefat (*Baccharis glutinosa*) can be found in this community, which lines most drainages having seasonal surface water. Because of the availability of water and the increased structural complexity resulting from a multi-layered canopy, this community contains a diversity of bird species. This community also forms a vital link for wildlife which remain in cover but seek water.



One of Many Riparian Corridors in the Verdugo Mountains.

d. Coastal Sage

Limited expanses of coastal sage are present in the areas studied. This community differs from chaparral in that characteristic species are dormant in summer. This is an alternative survival strategy to the deep-rooted tactic used by chaparral species to survive southern California's extended summer drought. Coastal sage species usually have leaves that are somewhat large and less thick than those of chaparral shrubs. Coastal sage occurs in a disturbed area above Oakmont Country Club in the Verdugos and in Dukemejian Park. Characteristic species include California sage (*Artemisia californica*), black sage (*Salvia mellifera*), and purple sage (*Salvia apiana*). Although California sage and black sage occur with chaparral species both in the Verdugos and the San Rafael Hills, chamise (*Adenostoma fasciculatum*), the most common chaparral shrub, is always part of the assemblage. As a result, this type of sub-assemblage, which often occurs on drier slopes such as southern exposures, has sometimes been classified as chaparral.

e. Alluvial Scrub

This community occurs in washes at the base of drainages where the streambed widens and the walls defining the canyon disappear. Characteristic species include mulefat (*Baccharis glutinosa*) and scale broom (*Lepidospartum squamatum*) as well as a number of species also found in other communities. The only naturally occurring community of this type in the study area is found at the base of Dunsmore Canyon in Dukemejian Park.

f. Walnut Woodland

Two small patches of this community occur within the chaparral matrix in the Verdugo Mountains just north and just south of the main east-west ridgeline. The dominant species is the California walnut (*Juglans californica*). In addition, California walnuts co-occur with coast live oaks in parts of the oak woodland in the larger privately held parcel adjacent to Glenoaks Boulevard. The range of this community is perceived to be declining in Southern California.

g. Big Cone Spruce (*Pseudotsuga macrocarpa*)

A small patch of big cone spruce (*Pseudotsuga macrocarpa*) occurs on the western wall of Cooks Canyon. Other patches probably also occur further upstream in both Cooks Canyon and Dunsmore Canyon. These majestic trees are characteristic of mid-to lower-elevation (2,000-6,000 foot) dry slopes within the San Gabriel Mountains (Munz, 1974). The individuals in Cooks Canyon are close to the lower elevation limit and are a welcome and unusual sight so close to an urban area.

2. Wildlife

Wildlife observed directly or indirectly include Audubon's cottontail, coyotes, deer, woodrats, western whiptails, San Diego horned lizards, western fence lizards, side-blotch lizards, gopher snakes, and western toad tadpoles. Wildlife expected to occur but not observed include mammals such as raccoons, skunks, opossums, and bobcats. There have been recent reports of mountain lions in the Verdugo Mountains; however, no tracks or scat were observed. Small mammals expected include the San Diego pocket mouse, brush mouse, deer mouse and to a limited extent, the Pacific kangaroo rat. A complete list of birds observed in all study areas is available in the Planning Division office. Reptiles expected but not observed include the southern Pacific rattlesnake, common kingsnake, striped racer, the southern alligator lizard and amphibians such as the Pacific tree frog. The majority of these species occur in all communities with

the exception of the toad and frog which are restricted to riparian areas. Most reptiles observed were seen basking at the edge of road cuts in the chaparral.

With the exception of the amphibians and most of the reptiles, the majority of these species move between the chaparral and woodland communities. Reptiles are largely associated with chaparral. Frogs and toads are restricted to the southern oak riparian community within drainages. Larger mammals move freely between chaparral and woodland in order to gain access to food resources and water. The small mammals listed are distributed throughout the chaparral and woodland communities.

3. Habitat Areas

The three mountain ranges within the City of Glendale were evaluated for their biological resources including an assessment of riparian habitats. Within each mountainous region are water-courses containing seasonal or year round surface water, which are also known as blue-line streams. A detailed discussion of water resources and the location of these blue-line streams are found in the Hydrology section of this document. The following sections discuss the general habitat characteristics of each mountainous region in the city. Table 4-2 summarizes the characteristics of the riparian areas.

San Rafael Hills

The San Rafael Hills are comprised of three parallel ridges oriented north to south. Between these ridges are drainages which are now urban areas; however, remnants of the original canyon vegetation remain as sycamore trees (*Platanus racemosa*) and coast live oaks (*Quercus agrifolia*). In southern California, southern oak woodland communities usually border canyon bottoms, and in the San Rafael Hills this typical arrangement of plant assemblages remains in areas that have not been built out, such as the west facing slopes of the easternmost ridges bordering Glenoaks Boulevard and Chevy Chase Drive. In drainage bottoms with moderately high water tables, sycamore trees and mulefat (*Baccharis glutinosa*) co-occur with the coast live oaks. In drainages with higher water tables, mugwort (*Artemisia dracunculus*), California rose (*Rosa californica*), and willows (*Salix* sp.) occur along with the sycamores. Cattails were observed in drainage bottoms with permanent standing water. Remnants of these communities persist in Sycamore Canyon which runs parallel to Chevy Chase, and in side canyons that drain the ridges and are oriented east to west.

TABLE 4-2 ANALYSIS OF BLUE-LINE STREAMS

Parcel*	Ranking	USGS Canyon Name	Blue-Line Streams
SR 1	N/A		
SR 2	3	None	3
SR 3	1	None	1
SR 4	N/A		
SR 5	N/A		
SR 6	N/A		
SR 7	3		1
SR 8	N/A	None	
SR 9	N/A		
SR 10	N/A		
VER 1	3	None	1
VER 3	4	Hillcrest	1
VER 4	4	Idlewood	1
VER 5	N/A		
VER 6	3	Upper Deer Upper Elmwood Upper Childs	3
VER 7	1	Engleheard	
VER 8	2	None	2
VER 9	2	None	1
SNGB 1	N/A		1

Key to Parcel Abbreviations

SR = San Rafael Hills

VER = Verdugo Mountains

SNGB = San Gabriel Mountains

Key to Stream Rankings

1 = Presence of permanent standing water in drainage

2 = Evidence of permanent standing water in drainage

3 = Evidence of frequent periodic standing water in drainage

4 = Evidence of infrequent periodic standing water in drainage

* See Maps 4-14, 4-15, and 4-16 for location of privately held properties.



Species composition of all communities within the San Rafael Hills was similar to that of the Verdugos; however, the total diversity of each community type was slightly reduced. For example, silk tassel (*Garrya* sp.) was not observed in the chaparral assemblages in the San Rafael Hills but was found in the Verdugos. The extensive fragmentation resulting from conversion of open space to housing in the San Rafael Hills has resulted in disturbance within the assemblages present. For example, much of the chaparral assemblage on southern or eastern exposures is a matrix of introduced grasses and chaparral shrubs. In addition, many of the southern oak riparian patches within the canyon bottoms support an understory of introduced grasses.

Verdugo Mountains

The main ridgeline of the Verdugos is situated southeast to northwest. Side ridges oriented north to south extend from the main ridge. Like the San Rafael, the Verdugo Mountains are characterized by canyon bottoms which support southern oak riparian vegetation. Some of the riparian vegetation within the drainages is quite well developed and includes alder (*Alnus rhombifolia*) in addition to the oaks, sycamores and willows characteristic of this assemblage. These give way to southern oak woodland and then to chaparral as water availability decreases.

San Gabriel Mountains

The portion of the San Gabriel mountains within the City of Glendale consists of a series of north-south oriented ridgelines which extend from a major east-west ridge. These ridges are bisected by two canyons which contain year-round water and support a lush and diverse riparian assemblage. A large section of this area makes up Dukemejian Wilderness Park. The chaparral is fairly diverse but lacks some species found in the Verdugos.

c. Open Space in Private Ownership

In addition to mapping the vegetation of the Verdugo Mountains, San Rafael Hills and the portion of the San Gabriel Mountains within the City of Glendale, the biological study was concerned with characterizing privately held parcels. A set of criteria was developed to allow comparison of these various parcels. The parcels were ranked both in terms of vegetation characteristics and habitat value characters. Criteria included:

Vegetation Characteristics

1. The proportion (percentage) of each community type relative to the total amount of such vegetation within

the study area.

2. The number of different communities represented in a parcel.
3. The species diversity relative to overall species diversity in the study area.

Habitat Character Values

1. Degree of isolation of each parcel represented determined by the number of borders a parcel shared with continuous open space.
2. Parcel size.

The character values shown above are important factors in assessing habitat value since size determines the total number of individuals, both plants and animals, a given area can support, and the degree of isolation determines the probability that animal or plant individuals can move into or out of a parcel. This last point becomes particularly important when considering long term habitat value. If there are no "hallways" connecting a parcel with a larger expanse of open space (such as the San Gabriels), populations of plants and animals run a higher risk of localized extinction as a result of fire or other catastrophic event. In addition, isolated populations of plants and animals usually show lower levels of genetic diversity than their counterparts occupying larger areas. This is presumably due to the lack of genetic exchange which brings new genes into a population. In a study done in San Diego County, the likelihood of extinction of songbirds in habitat fragments was found to increase as fragment size decreases, and the likelihood of localized extinction increased overall with increasing fragmentation (Boulger et. al., 1991; Soule et. al., 1988). In addition, Alberts et. al. (1993) found that larger fragments of habitat in San Diego County supported increased numbers of native plant species and smaller fragments supported increased numbers of introduced weedy species.

The relative proportion within each sub-area of the total extent of coverage of each community type in all areas considered is given in Table 4-3. The majority of the coverage on each site is chaparral. The extent of the disturbed area is not provided in Table 4-3; however, it is approximately five percent of the total existing open space in the San Rafael Hills and less than one percent of the total existing open space in the Verdugo Mountains. The increased disturbance in the San Rafael Hills is the result of an increase in road cuts and urban/open space interfaces relative to the Verdugo Mountains. The majority of both southern oak woodland and southern oak riparian habitats occurs in the Verdugos. In ad-

TABLE 4-3 VEGETATION CHARACTERISTICS OF PRIVATELY OWNED PARCELS IN THE AREAS STUDIED

Parcel	% Oak Wood	% Total Oak Wood	% Sor Wood	% Total Sor Wood	% Chap	% Total Chap	% Rel Div	# Comuty Types	Rank
SR 1	26.47	6.22	0.00	0.00	73.52	2.42	3	2	7
SR 2	6.98	11.35	7.95	12.92	85.06	5.49	4	3	1
SR 3	0.00	0.00	10.75	2.08	89.24	0.72	3	2	4
SR 4	24.92	2.89	0.00	0.00	75.08	0.09	3	2	9
SR 5	0.00	0.00	41.12	1.52	58.87	1.52	2	2	6
SR 6	0.82	0.03	0.00	0.00	99.17	0.47	2	2	12
SR 7	0.00	0.00	16.73	2.29	83.39	0.47	3	2	5
SR 8	0.00	0.00	0.00	0.00	100	0.17	2	1	19
SR 9	0.00	0.00	0.00	0.00	100	0.22	2	1	18
SR 10	0.00	0.00	0.00	0.00	100	0.61	2	1	16
VER 1	17.13	2.12	0.00	0.00	82.86	0.42	2	1	11
VER 3	0.00	0.00	0.00	0.00	1.00	0.71	2	1	14
VER 4	0.00	0.00	0.00	0.00	1.00	0.77	2	1	13
VER 5	0.00	0.00	0.00	0.00	1.00	0.54	2	1	17
VER 6	34.78	2.50	0.00	0.00	65.21	0.19	3	2	8
VER 7	5.04	9.55	5.02	9.52	89.94	7.10	4	3	2
VER 8	20.42	2.36	0.00	0.00	79.57	0.38	3	2	10
VER 9	40.72	9.76	5.21	1.25	54.06	0.54	4	3	3
SNGB 1	0.00	0.00	0.00	0.00	100	2.68	2	1	20

Key to Habitat Types

Oak Wd = Southern Coast Live Oak Woodland
 SOR Wd = Southern Oak Riparian Woodland
 Chap = Chaparral

Key to Diversity Ranking

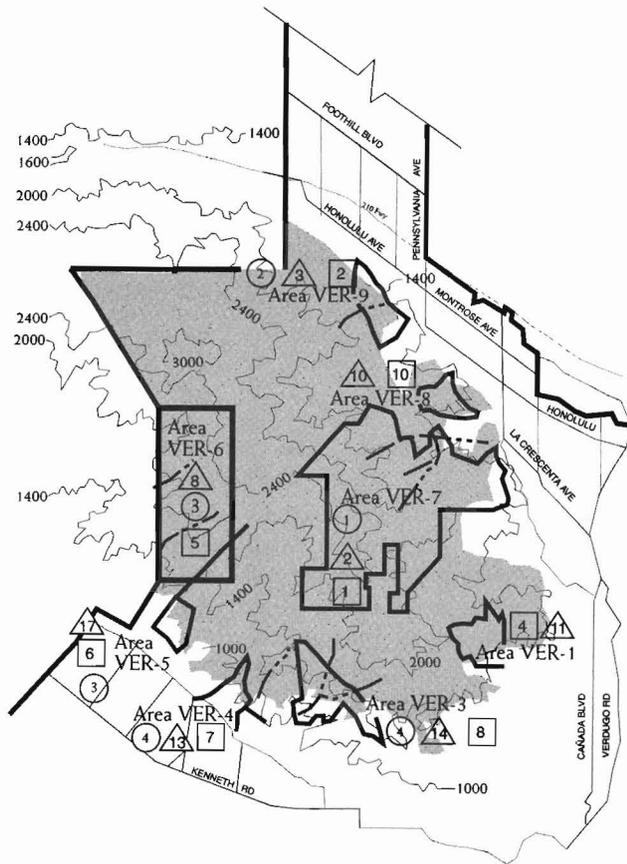
90-100% Possible Species = 4
 70-89% Possible Species = 3
 50-69% Possible Species = 2
 >50% Possible Species = 1

dition, the Verdugo Mountains support four streams with permanent water. These are located in Engleheard Canyon, Henderson Canyon, Brand Canyon and Pomeroy Canyon. A fifth stream with permanent water is Deer Creek (see Map 4-14). Within the San Rafael Hills, only Sycamore Canyon and the Linda Vista area, and the series of drainages off Cascadia Drive (see Map 4-15) hold year-round water, although the drainages along the Pasadena border probably hold water for a majority of the

year. Water availability in the drainages in the San Rafael Hills is increased substantially by run-off from urban areas; this type of water may pose a threat to wildlife since run-off often contains traces of pesticides, herbicides and petroleum products. Most of both Cooks Canyon and Dunsmore Canyon lie within the City of Glendale (see Map 4-16). These major drainages also hold year-round water.



MAP 4-14 BIOLOGICAL RESOURCES OF PRIVATELY HELD PROPERTY VERDUGO MOUNTAINS

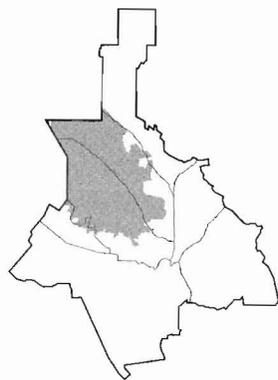


Map Not To Scale

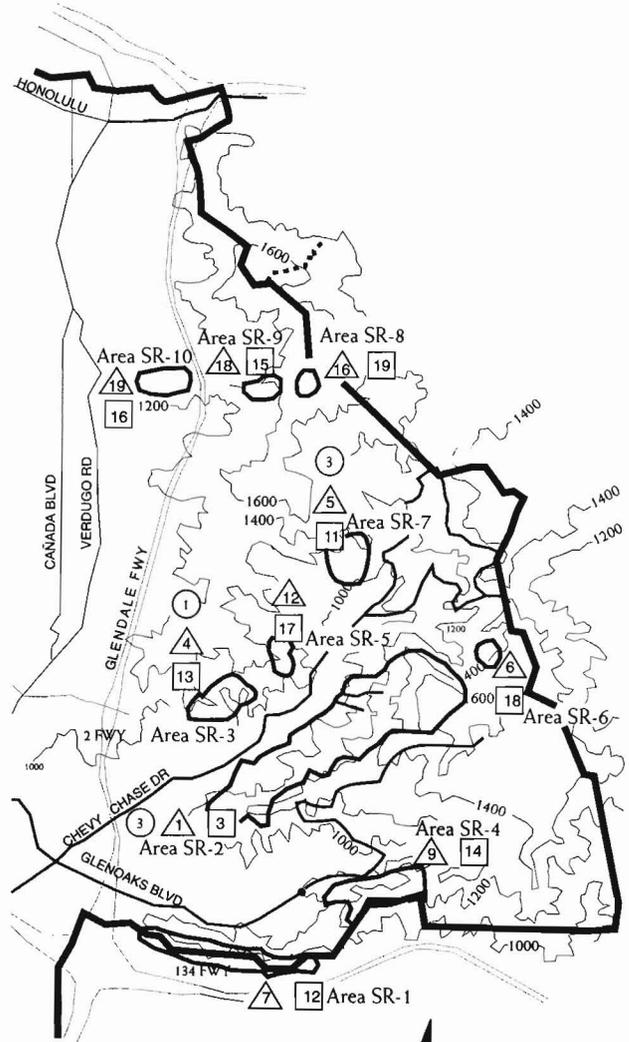
Study Area Value Rankings

- △ Vegetation Character (Privately Held Property)
- Habitat Character
- Blueline Streams

Note: See Tables 4-2, 4-3 and 4-4
 Source: Adapted from field sheets of Dr. Cheryl Swift, Biological Consultant



MAP 4-15 BIOLOGICAL RESOURCES OF PRIVATELY HELD PROPERTY SAN RAFAEL HILLS

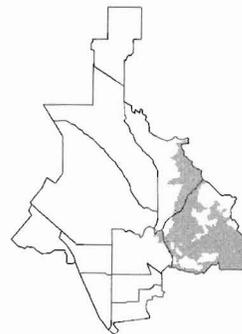


Map Not To Scale

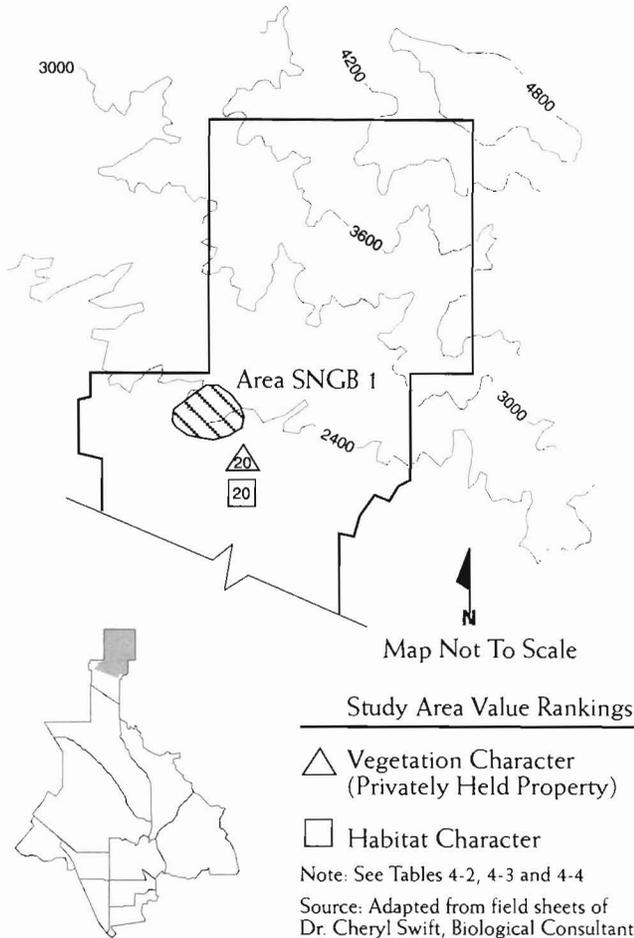
Study Area Value Ranking

- △ Vegetation Character (Privately Held Property)
- Habitat Character
- Blueline Streams

Note: See Tables 4-2, 4-3 and 4-4
 Source: Adapted from field sheets of Dr. Cheryl Swift, Biological Consultant



MAP 4-16 BIOLOGICAL RESOURCES OF PRIVATELY HELD PROPERTY SAN GABRIEL MOUNTAINS



Vegetation "Value"

Vegetation characteristics of each parcel under consideration are also given in Table 4-3. The rankings in Table 4-3 are based on the number of communities present, the percent of total coverage of southern oak woodland and oak woodland in the areas studied and the species diversity ranking. In general, species diversity closely parallels the number of communities present. Little or no difference exists between the parcels evaluated in terms of diversity within community type except that the longer drainages examined in the Verdugos generally had a higher species diversity than the shorter drainages in the San Rafael Hills. However, these differences are a matter of two or three species out of 30 to 40 species. The largest parcel in the San Rafael Hills, parcel #2, ranked highest with respect to these criteria largely because it represented a higher percentage of total oak woodland and southern oak woodland than the large

parcel in the Verdugos, parcel #7, which ranked highest. The third and fourth ranked parcels occurred in the Verdugos and San Rafael Hills respectively. The Verdugo parcel #9 ranked slightly higher because of the increased number of communities present. San Rafael parcels #7 and #5 were ranked fifth and sixth respectively as a result of denser southern oak woodland coverage than San Rafael parcel #1. Southern oak woodland was afforded slightly higher "value" because it indicates a drainage which probably has water available for part of the year and may act as a corridor for wildlife. San Rafael parcels #1 and #4 ranked seventh and eighth ahead of Verdugo parcel #6 on the basis of the extent of southern oak woodland coverage. Verdugo parcels #6 and #8 ranked ninth and tenth.

Habitat "Value"

The rankings for habitat value were derived by including size and relative isolation of the parcels as factors in the vegetation analysis (Table 4-4). The large Verdugo parcel #7 ranks first and the large San Rafael parcel #2 ranks third. This is primarily due to the larger size and increased contiguity with the open space of Verdugo parcel #7. Although the size, community representation, and extent of southern oak woodland and southern riparian woodland merit preservation of San Rafael parcel #2, the value of this parcel as an isolated expanse within a highly fragmented area must be taken into consideration. Verdugo parcel #9 ranks second with respect to these criteria because it is relatively large, diverse and is continuous with open space on two sides. In fact, most of the parcels in the Verdugos ranked much higher than the San Rafael parcels because of the high degree of fragmentation in the San Rafael Hills resulting from urban expansion. In addition, although deer, bobcat, and coyotes are presently found in the San Rafael Hills, as fragmentation continues populations occupying these parcels will be reduced or eliminated, especially in the event of a catastrophic event such as a fire. The lack of a clear corridor of open space with appropriate resources into these isolated parcels will impede re-colonization. Although animals may be moving from the San Gabriel Mountains through the Arroyo Seco and into the San Rafael Hills, there are few records of road kills of large animals moving in these areas. This suggests that the number of animals moving may be small (Swift and Collins, 1992).

In summary, while vegetation features of the larger parcels in the San Rafael Hills, particularly parcels SR #1, #2 and #3 merit preservation, the better habitat overall exists in the Verdugo Mountains. Verdugo parcel #7 is by far the most attractive, with respect to both habitat value and vegetation value, of the parcels studied.



TABLE 4-4 HABITAT VALUE OF PRIVATELY OWNED PARCELS IN THE SAN RAFAEL HILLS / VERDUGO MOUNTAINS / SAN GABRIEL MOUNTAINS

Parcel	% Oak Wood	% Total Oak Wood	% SOR Wood	% Total SOR Wood	% Chap	% Total Chap	% Rel Div	# Comuty Types	Rank
SR 1	26.47	6.22	0.00	0.00	73.52	2.42	3	2	12
SR 2	6.98	11.35	7.95	12.92	85.06	5.49	4	3	3
SR 3	0.00	0.00	10.75	2.08	89.24	0.72	3	2	13
SR 4	27.92	2.89	0.00	0.00	75.08	0.09	3	2	14
SR 5	0.00	0.00	41.12	1.52	58.87	1.52	2	2	18
SR 6	0.82	0.03	0.00	0.00	99.17	0.47	2	2	17
SR 7	0.00	0.00	16.73	2.29	83.39	0.47	3	2	11
SR 8	0.00	0.00	0.00	0.00	100.00	0.17	2	1	16
SR 9	0.00	0.00	0.00	0.00	100.00	0.22	2	1	15
SR 10	0.00	0.00	0.00	0.00	100.00	0.61	2	1	19
VER 1	17.13	2.12	0.00	0.00	82.86	0.42	2	2	4
VER 3	0.00	0.00	0.00	0.00	1.00	0.71	2	1	8
VER 4	0.00	0.00	0.00	0.00	1.00	0.77	2	1	7
VER 5	0.00	0.00	0.00	0.00	1.00	0.54	2	1	6
VER 6	34.78	2.50	0.00	0.00	65.21	0.196	3	2	5
VER 7	5.04	9.55	5.02	9.52	89.94	7.10	4	3	1
VER 8	20.42	2.36	0.00	0.00	79.57	0.28	3	2	10
VER 9	40.72	9.76	5.21	1.25	54.06	0.54	4	3	2
SNGB 1	0.00	0.00	0.00	0.00	100.00	2.62	2	1	20

Key to Habitat Types

Oak Wd = Southern Coast Live Oak Woodland
 SOR Wd = Southern Oak Riparian Woodland
 Chap = Chaparral

Key to Diversity Ranking

90-100% Possible Species = 4
 70-89% Possible Species = 3
 50-69% Possible Species = 2
 >50% Possible Species = 1

d. Rare and Endangered Species

The locations of plant assemblages were mapped in 1992 in the field using topographic maps at a 1:400 scale. Areas of different vegetation types were determined for each parcel under consideration and for the remainder of the area under investigation. The percentage cover

of total cover in all three areas (Verdugo Mountains, San Rafael Hills and San Gabriel Mountains) of each plant assemblage, the size of the parcel, and the relative species diversity were calculated for each parcel.

The characteristic species composition of all plant assemblages identified was determined in the field. A species diversity ranking was developed and provides an assessment of the relative species diversity of each parcel based on field observations and the number of community types present in each parcel (see Table 4-4).

The Natural Diversity Data Base maintained by the California Department of Fish and Game provided information about possible rare species present in the areas under investigation. In addition, the California Native Plant Society Inventory of Rare and Endangered Vascular Plants was consulted to identify plant species potentially occurring that are not yet listed by the State or Federal governments. The following section includes an annotated list of species which are reported from nearby areas and for which habitat exists within the study area.

1. Flora

Greata's Aster (*Aster greatai*)

This species is reported from the Verdugos and from the San Gabriels and is likely to occur in southern oak woodland or southern oak riparian woodland

- Nevin's Barberry (*Mahonia nevinii*)

The species is reported from the Arroyo Seco and prefers sandy, gravelly places within the chaparral community on the edges of washes. Appropriate habitat for this species is present in the Verdugos and Dukemejian Park. This species is listed as endangered by the state of California and is a candidate for federal listing.

- Nevin's Bricklebush (*Brickellia nevinii*)

This species was observed in the San Gabriel Mountains study area and prefers drier areas, particular road cuts or dry canyon walls. It is on a watch list of plants maintained by the California Native Plant Society because populations within California are perceived to be in decline.

- Braunton's Rattleweed (*Astragalus brauntonii*)

This California endemic prefers recently burned areas and has been reported from the Mt. Wilson area; however, it is unlikely to occur at this time in the study area. It is listed by the California Native Plant Society as 1B, which indicates that the species is considered rare enough to warrant listing. However, it is not listed by the Federal government at this time.

- Davidson's Bush Mallow (*Malacothamnus davidsonii*)

This species is a candidate for Federal listing, and it is found primarily in washes in the area. Appropriate habitat exists for this species in the San Gabriel Mountain study area and on the south slope of the Verdugo Mountains at the bases of the larger streams. This species was not observed during field surveys.

- San Gabriel Mountains Dudleya (*Dudleya densiflora*)

This species is a candidate for Federal listing, but has not been reported from the area. It is primarily found on canyon walls. Appropriate habitat exists in Cooks Canyon in the San Gabriel Mountains study area.

- Slender Horned Centrostegia (*Centrostegia leptoceras*)

This species is listed by both State and Federal agencies and is fully protected. A population was recently discovered in Tujung Wash. The species appears to prefer the benches above the washes. There is limited potential habitat for this species in the San Gabriel Mountains area of study and on the south slope of the Verdugos.

- San Fernando Valley Spineflower (*Chorizanthe parryi fernandina*)

This species was reported in the vicinity, but is now presumed extirpated in these areas. It is a candidate for federal listing. It prefers sandy, gravelly places at the edges of washes. Limited appropriate habitat is present on the south slope of the Verdugos and in the San Gabriel Mountains area of the study.

2. Fauna

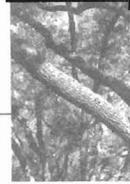
- California Gnatcatcher (*Poliophtila californica*)

This small bird prefers coastal sage scrub with a high coverage of California sage (*Artemesia californica*).

There is a small patch of appropriate habitat at the southern edge of Dukemejian Park. However, it is unlikely that this area supports a population of these birds as a result of limited size and degree of isolation.

- Least Bell's Vireo (*Vireo bellii pusillus*)

This bird requires dense willow thickets, which are not present in the study area, for nesting and is not reported from the area.



- Golden Eagle (*Aquila chrysaetos*)

This species is fully protected and is likely to occur within the study area although it was not observed.

- Cooper's Hawk (*Accipiter cooperi*)

This species is on a list of species considered threatened and declining in number in California. It is usually associated with riparian habitat and was observed in the Verdugo Hills.

- Southwestern Pond Turtle (*Clemmys marmota pallida*)

This species is reported from the immediate area, and appropriate habitat exists in the Verdugos. In an effort to eliminate illegal collecting, exact locations of pond turtle populations are not available from the California Department of Fish and Game. Illegal collection of these turtles is a secondary factor influencing abundance of the species. These animals require large standing pools with basking areas.

- San Diego Horned Lizard (*Phrynosoma coronatum blainvelli*)

This species was observed on the ridge which forms the western wall of Henderson Canyon. This lizard is a candidate for Federal listing, and is reported from the immediate vicinity. Appropriate habitat exists all along the major ridges in the Verdugos where vegetation is less dense.

3. Sensitive Plant Communities

a. Riversidian Alluvial Fan Sage Scrub

The Haines Canyon expanse of this sensitive community is listed by the Natural Diversity Data Base.

b. Southern Oak Riparian Forest/Southern Sycamore Alder Riparian Woodland

These community types are both referred to as southern oak riparian forest in this study. A number of locations within the study area are reported by the Natural Diversity Data Base including Engleheard Canyon, Deer Creek, Sheep Corral Canyon, Henderson Canyon, Dead Horse Canyon, Cooks Canyon, Sycamore Canyon (only San Rafael occurrence), Pomeroy Canyon, Wildwood Canyon, Stough Canyon and Sunset Canyon. Maps 4-13 show sensitive native plant communities in the Verdugo Mountains, the San Rafael Hills and the San Gabriel Mountains.

c. Significant Ecological Areas

In the mid 1970s, as part of its mandate to revise the Environmental Development Guide (the 1970 Los Angeles County General Plan), the Los Angeles County Regional Planning Department conducted a survey of the County's biotic resources. Environmental Research Systems Incorporated (ERSI) in conjunction with Englund and Nelson were contracted to complete this survey and subsequently submitted a background report to the County. In 1976 a General Plan technical supplement was produced which identified Special Management Areas. The 1980 Countywide General Plan identified 61 of these as Significant Ecological Areas (SEAs).

The Significant Ecological Areas were not intended to be a barrier to development. Rather, they provide a guide for prudent development within potentially sensitive areas. Furthermore, because natural habitats establish the SEA boundaries, several SEAs encroach into incorporated territory. This was the case throughout Los Angeles County in 1980, and, numerous annexations and incorporations by cities countywide since 1980 have further contributed to this situation. Los Angeles County has jurisdiction over those portions of SEAs within unincorporated areas. Documentation on SEAs, in whole or in part, lying within incorporated municipalities is offered as information only.

A portion of one SEA is within the city limits of Glendale. Significant Ecological Area 40, Verdugo Mountains, (see Map 4-12) contains chaparral, coastal sage scrub and riparian habitats. The County identified medium intensity recreational uses as compatible development.

4. Geologic Resources and Seismology

a. Soils and Geology

The City of Glendale includes portions of six geomorphic and geologic units: 1) the central part of the City is adjacent to the San Fernando Valley and Los Angeles River Basin; 2) the Verdugo Mountains bound the central part of the City on the north; 3) the San Rafael Hills bound the City on the east; 4) the northwestern portion of the Repetto Hills extend into the southeastern portion of the City; 5) a portion of the Crescenta Valley is in the northern part of the City; and, 6) the San Gabriel Mountains occupy the northernmost portion of the City and its boundary.

The mountainous areas are underlain by relatively hard types of igneous and metamorphic bedrock including quartz diorite, granodiorite and gneiss. Their composi-

tion dates from original sedimentary deposits, initial fault development and related upthrusting of rock formations and subsequent erosion and secondary fault activity. The older metamorphosed sedimentary rock (metasediments), known as the Placerita Formation, dates from the ancient ocean floor which existed in this area prior to the subsidence of the water and rising of the younger rock formation. This material was altered and shaped by a long history of lifting, deformation, fracture and erosion. This dynamic process has resulted in the upward thrust fault blocks which give the Verdugo, San Rafael and San Gabriel systems much of their characteristic ruggedness. Some parts of these features are relatively distinct, others have been fractured and broken by secondary joints and are, consequently, difficult to discern or map. Although some surficial material is easily eroded where fractured and broken, slopes are considered stable against landslides.

Top soil on the steeper slopes is generally absent or extremely thin with greater depth occurring in those areas which are less steep and where the roots of vegetation provide retention. In the canyons, bedrock is overlain by alluvium consisting of unconsolidated rocks, gravel and sand.

The small area of the Repetto Hills lying within the southeastern portion of the City is an exception to the composition of the other mountainous areas within the City in that they are primarily composed of conglomerate, sandstone and siltstone of the Topanga Formation with some granitic rocks present in the Forest Lawn area. The only known area of moderate slope instability within the City is located in a portion of the Forest Lawn Cemetery.

The central part of the City is underlain by the alluvium of the eastern San Fernando Valley with thicknesses varying from zero along the edge of the valley up to about 1,000 feet in the area near City Hall. This alluvium is underlain by tertiary materials similar to those in the Repetto Hills.

The Crescenta Valley lies principally on alluvial fan surfaces originating from the San Gabriel Mountains, sloping southeasterly toward and down Verdugo Canyon. The thickness varies from zero at the edges of the valley to about 500 feet along the northeast flank of the Verdugo Mountains near the head of Verdugo Canyon. The alluvium is underlain by granitic and metamorphic rocks similar to those in the Verdugo and San Gabriel Mountains (see Map 4-17).

b. Seismicity

The City of Glendale is located in a seismically active area. The most important fault within the City is the active Sierra Madre fault. The fault, located near the base of the San Gabriel Mountains in the extreme northern part of the City, is the eastward extension of the fault on which the 1971 San Fernando earthquake originated. Other faults of importance in Glendale are as follows: the Verdugo fault located near the southwest edge of the Verdugo Mountains, and its branches to the east (potentially active); the Sycamore Canyon fault (potentially active); the Verdugo Canyon fault (inactive); Scholl Canyon fault (inactive); the Eagle Rock fault (inactive); and the San Rafael fault (inactive). The York Boulevard fault also is important in that it may be a western extension of the Raymond Hill fault for which there is evidence of activity. Map 4-18 describes the seismic hazard zones within the City.

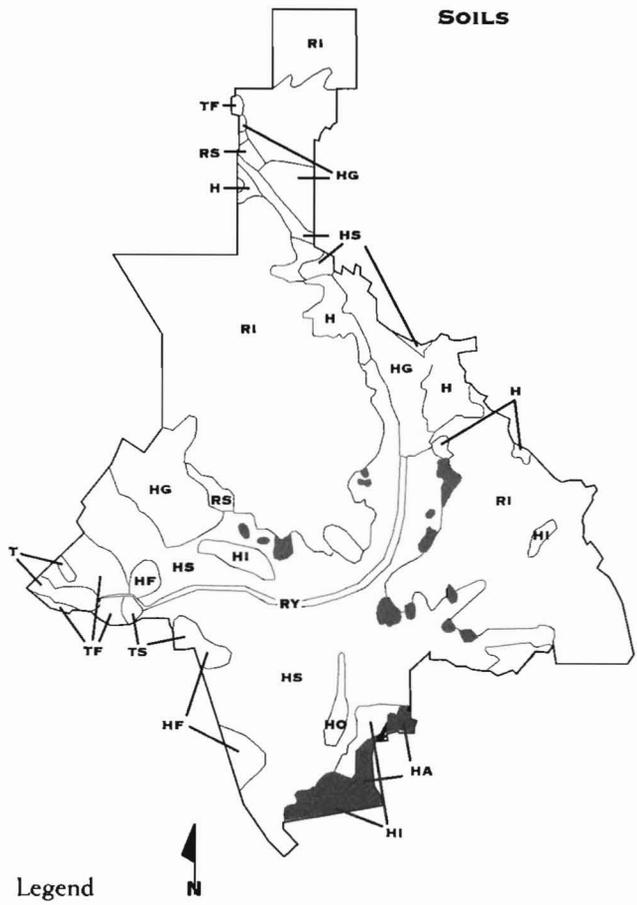
The San Andreas fault, located 22 miles northwest of the City, is a hazard in Glendale as a potential source of strong earthquake shaking and is interpreted as presenting a greater hazard than any of the faults located within the City's corporate limits. The area of particular interest is that segment of the fault between San Bernardino and Parkfield. Since the Parkfield break of 1857, this area has not moved and has been storing energy. There is probably enough energy stored in this segment of the San Andreas fault to generate an 8.5 earthquake at any time. This is the reason for the often quoted prediction of a "great earthquake" on the San Andreas fault during this century. Recent seismic activity from the Lander's quake in 1992 is also thought to have increased stress on the San Andreas fault in the San Bernardino area.

There are two major conclusions concerning faulting that can be drawn from the technical report of the Seismic Element: the primary seismic hazards to the City are the Sierra Madre, San Andreas and Raymond Hill faults; available data indicate that surface rupture associated with fault movement can be anticipated on the Sierra Madre, Verdugo and Sycamore Canyon fault zones.

With respect to open space planning, the Seismic Safety Element states "Areas which should be considered for open space zoning include lands designated as active landslides as well as active traces of the Sierra Madre, Verdugo and Sycamore Canyon Faults." With respect to housing, the element recommends restrictions on housing construction in at least the areas of moderate slope instability as well as astride or atop traces of the Sierra Madre, Verdugo and Sycamore Canyon Faults.



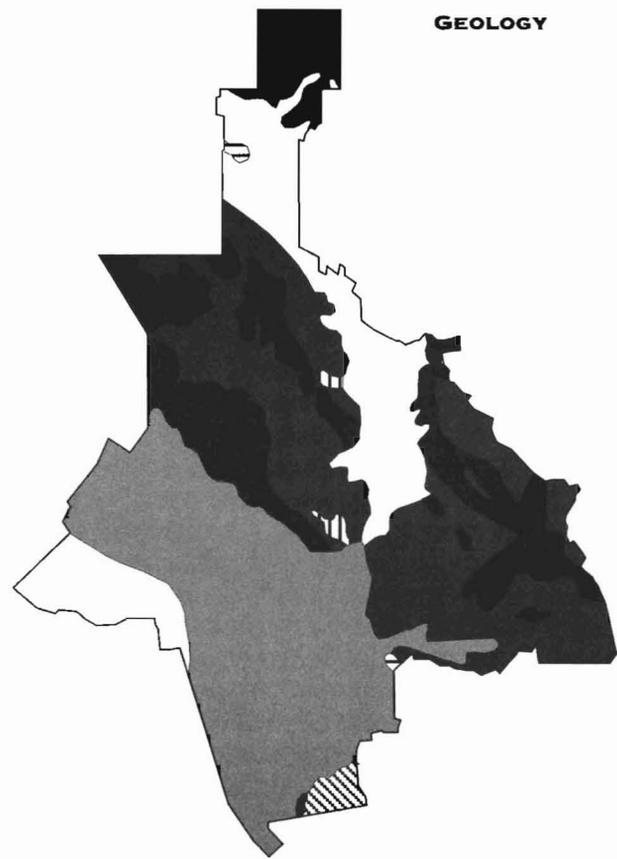
MAP 4-17 SOILS AND GEOLOGY



Legend

- HI Hanford Loam
- HO Hanford Sand
- HS Hanford Sandy Loam
- HF Hanford Fine Sandy Loam
- HG Hanford Gravelly Sandy Loam
- H Holland Loam
- HA Holland Sandy Loam
- RY Riverwash
- T Tujunga Sand
- TS Tujunga Fine Sand
- TF Tujunga Fine Sandy Loam
- RS Ramona Sandy Loam
- RO Ramona Loam
- RI Rough Broken Land
- MI Madera Fine Sandy Loam

Source: John W. Byer City of Glendale, 1969

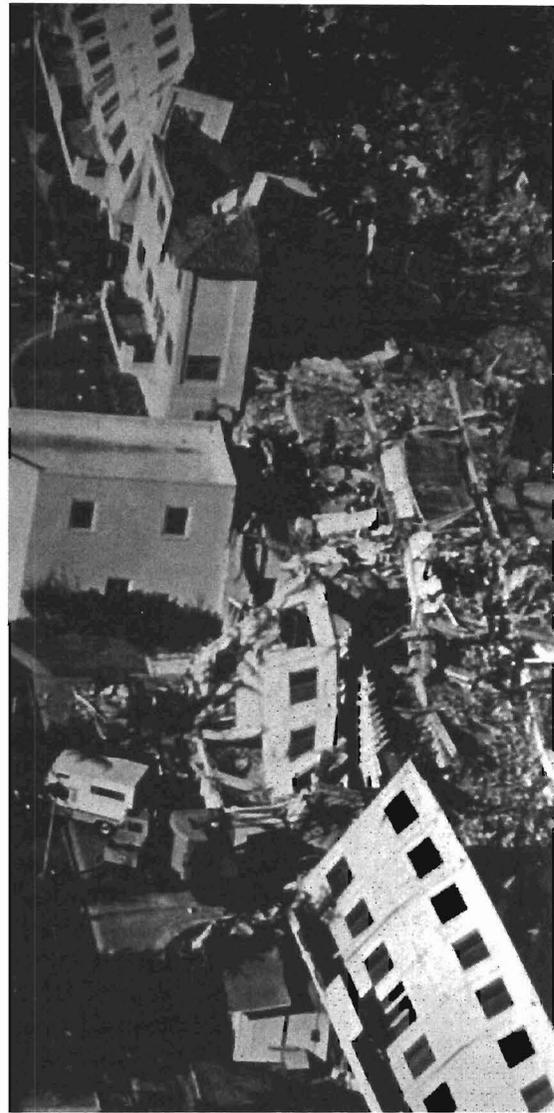
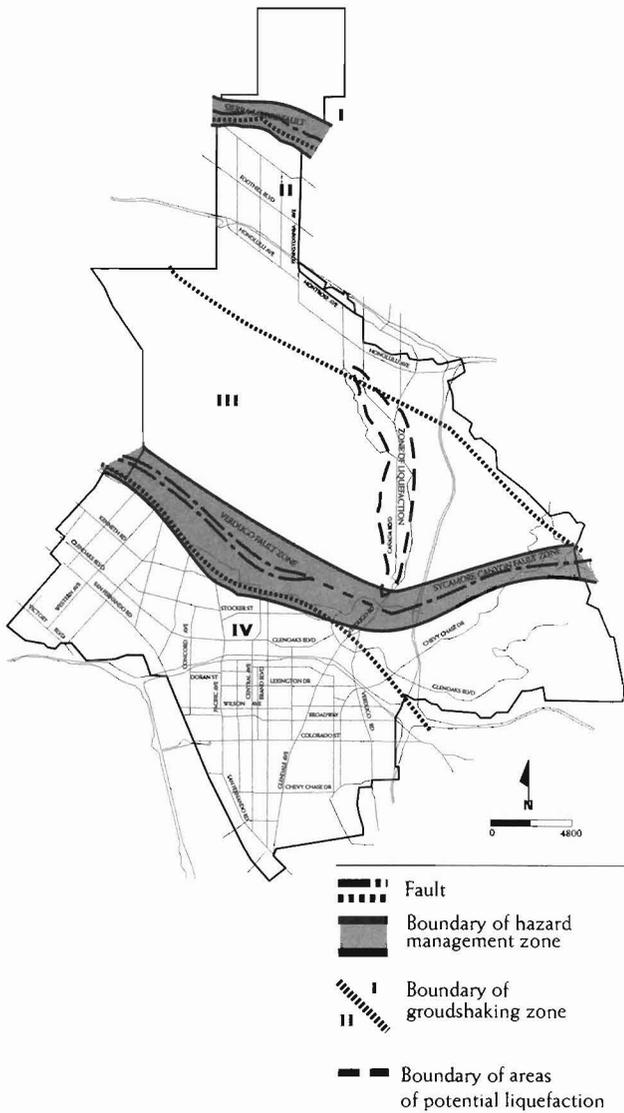


Legend

- Alluvium
- Pleistocene Non-Marine
- Mesozoic Granitic Rocks
- Undivided Precambrian Metamorphic Rocks
- ▨ Quarternary Non-Marine Terrace Deposits
- ▨ Mesozoic Basic Intrusive Rocks
- ▨ Pre-Cenozoic Granitic and Metamorphic Rock

Source: California Division of Mines and Geology

MAP 4-18 SEISMIC HAZARDS



Olive View Hospital, February 9, 1971 San Fernando Earthquake

The only known area of moderate slope instability within the City of Glendale is located in a portion of the Forest Lawn Cemetery area where no housing exists. The cemetery land itself represents a quasi-open space use.

c. Special Study Zones

In 1972, the State of California enacted the Alquist-Priolo Act which was intended to provide policies and criteria to assist City, County and State agencies in the exercise of their responsibilities to provide for public safety in hazardous fault zones. This legislation requires the State Geologist to delineate appropriate study zones to encompass all potentially and recent active faults. The only Special Study Zone in Glendale is along the Markridge Road area at the extreme northerly portion

of the City. The State Geologist has not completely mapped the Sierra Madre Fault within the City boundary, therefore, the Alquist-Priolo Act is applicable to only a portion of the City. This particular area is zoned R1 and is nearly completely developed. The City complies with all aspects of the Alquist-Priolo Act with regard to requirements for geologic reports, improved building requirements, and the establishment of special setback areas for active faults in new subdivisions.

5. Hazards

a. Introduction

The California Government Code suggests that open space planning assess the use of open space for public



health and safety including, but not limited to, areas which require special management or regulation because of hazardous or special conditions such as earthquake faults, unstable soil areas, flood plains, watersheds, areas containing high fire risk, areas required for the protection of water quality, and enhancement of air quality. The purpose of this section, therefore, is to assess the presence of these hazards within the City of Glendale.

b. Fire

The Safety Element of the General Plan provides for a detailed assessment of natural and urban fire hazards within the City. Several factors govern the potential hazards from wildland fires. The primary determinants are vegetation, wind direction and strength, slopes, human proximity and access. Glendale contains a variety of vegetation types, all of which are relatively flammable. However, the chamise-chaparral plant community is the most hazardous since these plants contain a large percentage of volatile oil within their tissues which can ignite very quickly. Although Glendale has a predominantly westerly breeze flow, the bulk of local fire outbreaks accompany the warm, off-shore, dry wind conditions commonly termed "Santa Anas." As a result, location is important in the assessment of fire risk. Finally, slope, human proximity and access are other factors which influence the degree of fire hazard.

Map 4-19 shows the brush areas within the city with the highest fire risk. The classification system utilized for the preparation of this map is included in Table 4-5.

The most fire prone area for the City is in the Verdugo Mountains due to the abundant availability of fuel in the form of chamise-chaparral and steep topography. High and medium fire risks also occur in the San Rafael Hills and the San Gabriel Mountains.

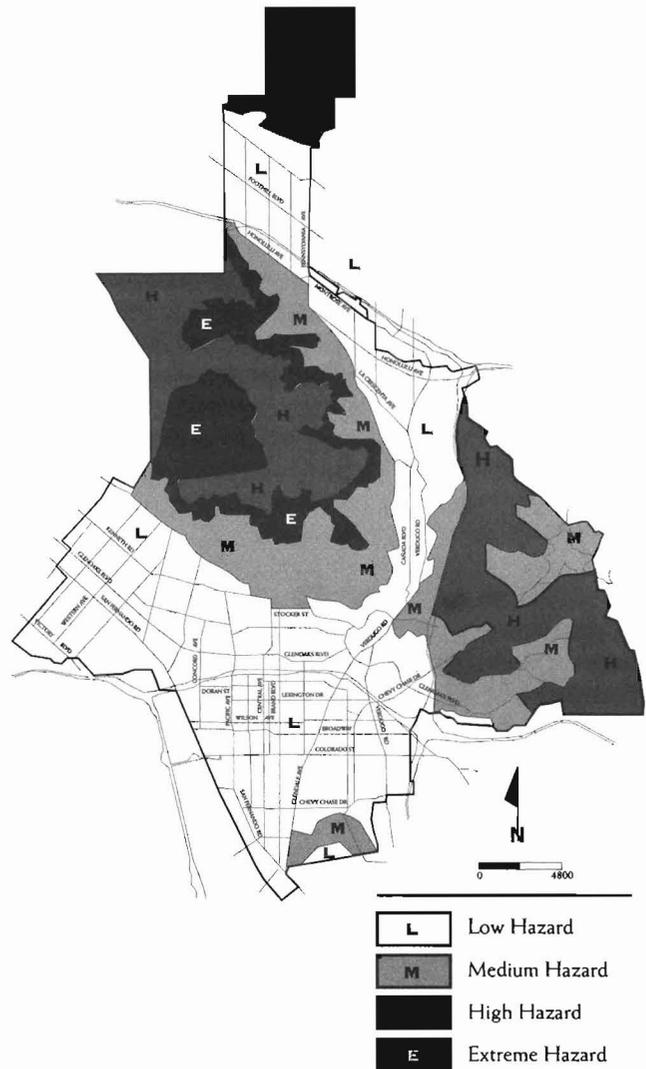
c. Flood Inundation

Flood hazards due to heavy precipitation can result in inundation of developed areas due to overflow of nearby stream courses or from inadequate local storm drain facilities. The City of Glendale is fortunate that a flood control system has been developed and has provided protection for its residents. The United States Department of Housing and Urban Development has not mapped any flood hazards for the City of Glendale.

d. Dam Inundation

Dam inundation hazards will result if a major structural failure occurs such as from seismic events or slope instability. Due to the various elevations which require wa-

MAP 4-19 BRUSH AREA FIRE HAZARD CLASSIFICATION MAP



Flooding was a problem before a flood control system was developed (La Crescenta area, 1934)

TABLE 4-5 FIRE HAZARD CLASSIFICATION SYSTEM

Hazardous Classification	Environmental Characteristics
Extreme Risk	Vegetation: Chamise Costal Chapparral Proximity: Fronting developed areas and/or west of fire prone vegetation communities Access: Very limited, topography extremely variable Slope: Very steep (40%+)
High Risk	Vegetation: Costal Chapparral, coastal sagewoodland Proximity: Near developed areas Access: Smoewhat limited Slope: Steep (20% to 40%)
Medium Risk	Vegetation: Lesser developed scrub Proximity: Developed areas lying near wildlands Access: Available Slope: Gental to moderate (0% to 20%)
Low Risk	Vegetation: Vacant lots and landscaping Proximity: Urban areas Access: Available Slope: Gentle (0% to 10%)



Home and garage near Legion Hall on Rosemont Avenue (1934).

e. Mud and Debris Flows

Mud and debris flows are potential hazards to lives and property in hilly portions of the City of Glendale. The removal of vegetation by fire lowers the stability of exposed soils and lessens the water holding capability of the local watershed. Because of the speed with which they move, mud flows can be quite destructive, especially along the bottom and at mouths of canyons. Although efforts to control flow has greatly mitigated the potential of mud flow hazards, Glendale is still susceptible to minor mud flows particularly for developments which were built under previous engineering design standards.

f. Noise

The Noise Element of the General Plan provides a noise assessment for the City. This element identifies major noise sources throughout the community and establishes policies and standards for a healthful noise environment. As related to open space planning, the Noise Element establishes an exterior noise level requirement of 60 Ldn for usable areas for housing. The element suggests that the normally acceptable range for playgrounds and neighborhood parks be established at less than 70 decibels. Major noise sources in the community include freeways, roadways and railroads. Open space can be utilized to buffer residential uses from major noise sources. The recent purchase of surplus freeway properties has helped reduce exposure of noise to future residents. Consideration, however, must also be given to the development of parks and active recreational facilities to ensure that an enjoyable noise environment is experienced by those users.

ter service in the City of Glendale (from elevations of 430 feet to more than 2,400 feet above sea level), the Public Service Division maintains a number of water storage reservoirs in hillside areas as part of its water supply system. Table 4-6 lists the largest reservoirs which are also classified as dams by the State of California. In addition to the seven reservoirs listed, the City also maintains 20 smaller water reservoirs for both domestic service and fire protection in hillside areas. The total capacity of all the reservoirs in the City is 540 acre feet.

The City of Glendale Public Service Division has completed, for the Office of Emergency Services (OEC), an inundation map of all reservoirs in the City. Should a structural failure occur in any of the reservoirs, the extent of potential inundation is recognized and evacuation limits have been established.



g. Composite Hazards

Composite hazards provide a risk to residents whenever one or more of the individual hazards occurs in one location. Usually this is associated with some type of disaster such as during a seismic event where risk is associated with numerous hazards such as liquefaction, landslides, fire, etc. It is very difficult to predict the extent of composite hazards that may occur in the City. However, to provide for the safety of residents, the City has established a comprehensive emergency operations program. The City maintains an Emergency Operations Center on a full time basis and has contracted with numerous other public agencies to provide mutual aid in the event of a disaster. No specific recommendations with regard to open space lands can be identified with this particular hazard.

6. Hydrology and Water Resources

a. Introduction

Because water resources contribute significantly to the environmental quality of natural areas and the community as a whole, the California Government Code requires that all cities include in their General Plan a Conservation Element and an Open Space Element that specifically address issues of identification and conservation of water resources. The water resource issues and requirements of the Conservation Element are:

- The protection, use and development of water courses and reservoirs,
- The analysis of the type and intensity of development in or adjacent to water bodies or courses,
- The protection of and development in watersheds and aquifer recharge areas,
- The protection or improvement of water quality, and
- The conservation of ground water.

For the Open Space Element the issues are:

- The designation of open space for the preservation of streams, stream banks and watershed lands.
- The acquisition of areas required for the recharge of aquifers and ground water basins,
- Access to streams and stream banks and their linkage to other recreation and open space areas, and

- The management of watersheds and water reservoirs requiring management for the public health and safety.

The open space areas of the City include many drainage courses and tributary streams. These natural water systems normally flow during the winter rainy season and for a short time in the spring. They are the source for both permanent streams and water areas and, via percolation into the permeable soils and fractured bedrock areas, the water table in general. Perennial springs in the deep canyon bottoms are fed by the water, which accumulate in the fractured rock and is slowly released into natural water courses.

Much of this natural water system has been altered at lower elevations and in canyon mouths by development. As a consequence, preservation and management efforts need to focus on maintaining or improving the conditions that allow these water resources to function. New development should continue to be evaluated in light of its impact on the natural flow of water. Enhancement of existing water management programs can ensure the long-term viability of plant and wildlife communities and the total water system.

b. Precipitation

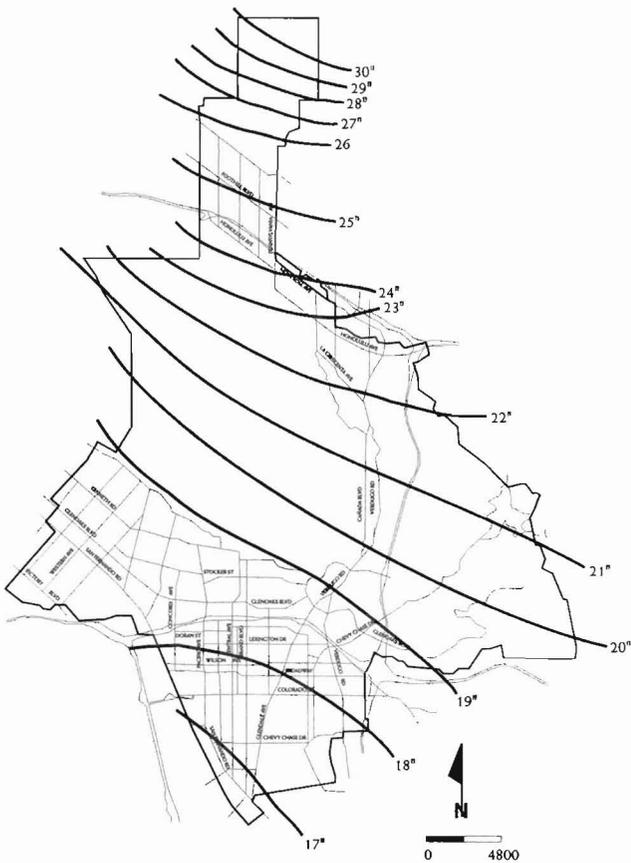
The variation of topography and elevation in the Los Angeles region influences the movement of rain clouds and resultant precipitation amounts. As shown on Map 4-20 annual rainfall generally increases with distance from the ocean and with proximity to the mountains. The average annual precipitation in Glendale ranges from 17.3 inches in the southern part of the city to 23.3 inches in the north. This range is primarily due to the change in elevation near the mountains. Rainfall is seasonal with the greatest amounts occurring during January and February. Eighty-five percent of Glendale's rainfall occurs from November through March.

c. Natural Water

1. Watersheds

The north and easterly facing slopes of the Verdugo Mountains drain into the Arroyo Verdugo drainage basin and directly feed aquifers, underground water basins and wells reserved exclusively for Glendale. The south-facing slopes of these mountains drain into the Los Angeles River basin which feed aquifers, ground water basins and wells shared by Glendale, Burbank and the City of Los Angeles.

MAP 4-20 AVERAGE ANNUAL PRECIPITATION (IN INCHES)



The watersheds of the San Rafael Hills drain into Chevy Chase Canyon, Glenoaks Canyon and Verdugo Canyon in Glendale. The easternmost and southernmost ridges drain to Pasadena and Eagle Rock, respectively.

The San Gabriel Mountains watershed drains into Glendale and the Arroyo Verdugo ground water basins. Groundwater basins recharged from the San Gabriels are shared by Glendale and the Crescenta Valley County Water District.

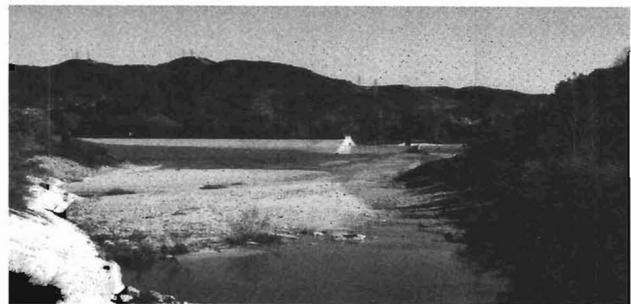
The distribution of annual runoff in the City varies between 0.5 inches in the southern part of the community to over 2.5 inches in the higher elevations including the San Gabriel Mountains and the Verdugo Mountains. Protection of these watersheds through conservation and open space measures are vital for the maintenance of Glendale's dwindling natural water resources.

2. Water courses

a. Natural stream channels

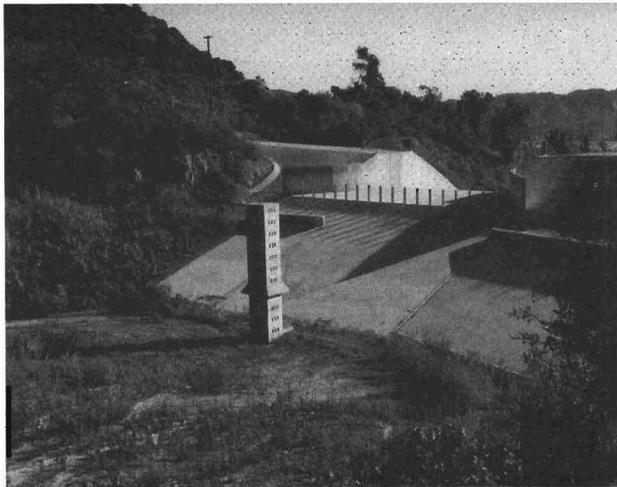
Stream channels shown on maps prepared by the U.S. Geological Survey as perennial or intermittent are referred to as "blue-line" streams. Any modifications to these blue-line streams are regulated by the State of California Department of Fish and Game. The U.S. Army Corps of Engineers also may have regulatory control of these channels. In Glendale, these streams (see Maps 4-25, 4-26, 4-27) are designated in most of the major canyons and stream channels whether or not they contain year-round water. These streams should be protected for their value as natural habitat as well as for their ability to absorb surface or spring waters for the ground water recharging process.

b. Flood Control Channels



Verdugo Basin near the Oakmont Country Club.

As the result of major floods that occurred in Glendale during the 1930s, a network of flood control channels were constructed. The channels funnel run off from the San Gabriel mountains and across the flat areas of the city to the Los Angeles River. The Arroyo Verdugo channel is the main channel carrying storm and run-off water through Glendale. This major channel begins near Lowell Avenue in north Glendale and leaves Glendale at the Los Angeles River near San Fernando Road and the Ventura Freeway. In the western part of the city near Paula Avenue and the Golden State Freeway, a portion of the Los Angeles River passes through Glendale. The Cooks Canyon, Blanchard Canyon, Dunsmore Canyon, Eagle Canyon, Goss Canyon, Pickens Canyon, Shields Canyon, Ward Canyon and Halls Canyon channels feed into the Arroyo Verdugo from the San Gabriel Mountains in the northern portion of Glendale. The flood control channels and the numerous debris basins and dams in the City of Glendale are maintained by the Los Angeles County Flood Control District and are shown in Maps 4-21 and 4-22.



Brand Park Basin in the Verdugo Mountains.

c. Flood Hazard Management Zones

The United States Department of Housing and Urban Development has established a nationwide program for the identification of flood hazards. This agency prepares specific maps for use by the public for the disclosure of flood hazards and for flood hazard insurance purposes. The Department of Housing and Urban Development has not mapped any flood hazards for property within the corporate boundary of the City of Glendale.

d. Ground Water

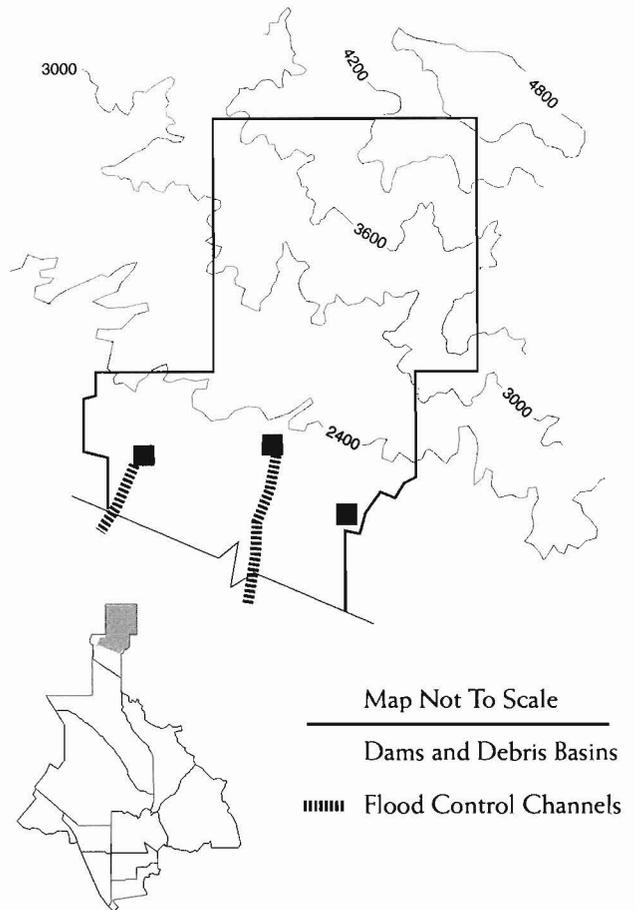
1. Water Basins

a. Location

The sandy porous soils of Glendale's unlined flood control basins act as aquifers to replenish the ground water table. The largest flood control basin and aquifer is the Verdugo basin located adjacent to the Oakmont Country Club in the northern portion of Glendale. Maps 4-21 and 4-22 show this and other basins. Some of the more important basins include Verdugo, Dunsmuir, Golf Club Drive, Linda Vista Drive, Beaudry, Hillcrest, Cooks, Child's, Brand, and Greenbriar.

Equally important to the recharge capability of Glendale's groundwater basins are stream channels in canyon bottoms and the porous fractured materials of Glendale's watersheds. The fractured condition of the rock understructure provides seepage which replenishes many springs at the upper elevations of stream channels. Map 4-27 shows there are nearly 30 such springs in the Verdugo Mountains that provide year round water flow to many stream channels. In turn, the porous gravel and sand of the stream bottom contribute to the recharge of ground water basins.

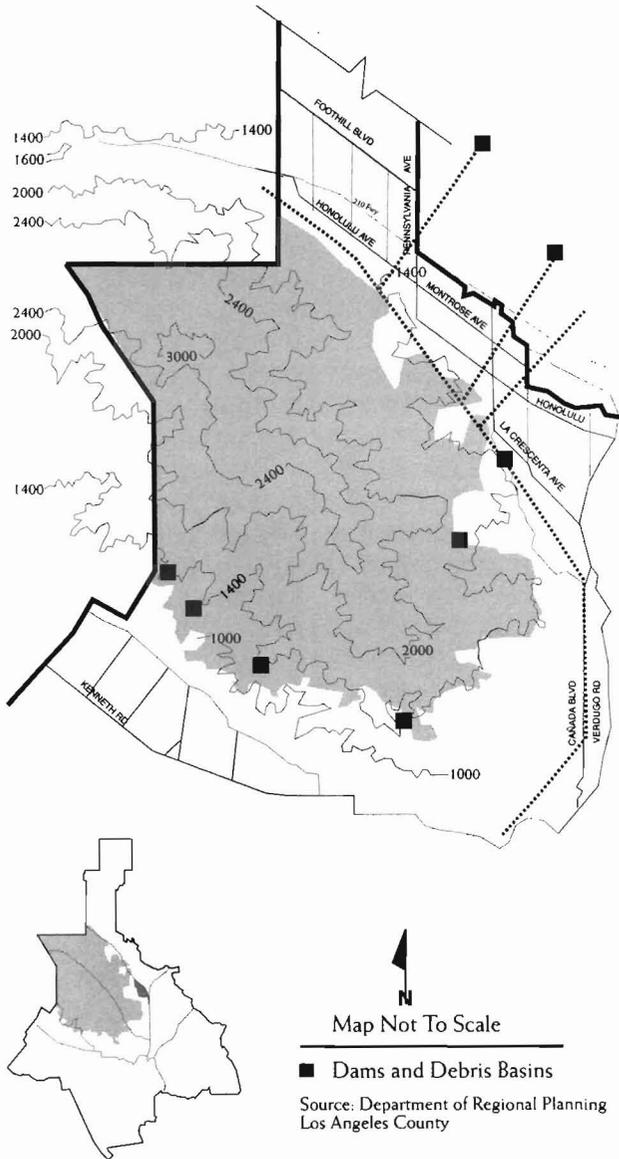
MAP 4-21 DAMS AND DEBRIS BASINS IN THE SAN GABRIEL MOUNTAINS



b. Open Space for Water Recharge

Ground water recharge is a complex process beginning in the upper reaches of watersheds, where water filters through the porous underlying fractured rock into springs and streams, is absorbed into stream channel bottoms and aquifers in the various flood control basins and dams, and, ultimately, into the underground water basins themselves. It is therefore important that these recharge areas be protected and preserved to ensure Glendale's water resources for the present and future. The use of open space preserves for ground water recharge should focus on the watershed surfaces of the upper canyon areas, stream channel bottoms, banks of streams, mouths of streams and aquifer basins.

MAP 4-22 DAMS AND DEBRIS BASINS IN THE VERDUGO MOUNTAINS



the capacities of the City's domestic and fire protection supplies.

The City's water distribution system is comprised of underground pipes, reservoirs and above ground tanks. There are no open reservoirs or lakes which provide the opportunity for recreation or which function as a habitat resource. The City has developed traditional parks above or on many of its underground reservoirs. The visual impacts of many of the recently constructed water supply tanks to serve hillside development have become a significant community concern.

Approximately 85 percent of the City's water needs are met with water from the Metropolitan Water District (MWD) of Southern California. This water is imported via the Colorado River Aqueduct or the California Aqueduct. The remaining 15 percent of the City's water demand is supplied by the City's Grandview Wells in the San Fernando groundwater basin and from the Glorietta Wells in the Verdugo Basin. The implementation of the Central Arizona Project on the Colorado River in 1985

TABLE 4-6 WATER RESERVOIRS

Reservoir	Elevation (in feet)	Gallons (in millions)
Markridge	1,993	3.5
New York	1,666	2.9
Verdugo	1,666	3.9
Park Department	1570	0.5
Chevy Chase West*	1,290	5.4
Rossmoyne	1,290	7.5
Park Manor	1,200	3.5
Brand Park*	968	10.2
Cevy Chase*	968	14.5
Glenoaks*	968	9.1
Glorietta*	968	35.7
Melwood	968	1.8
Diederich*	724	57.0
Western*	724	15.0

e. Water Management

1. Domestic Water Distribution System

a. Reservoirs and Dams

The City of Glendale furnishes water for domestic consumption, irrigation and fire protection purposes. The City operates its own wells, reservoirs and storage tanks, pump stations, treatment plants and distribution systems. Table 4-6 describes the location of these facilities and

*Reservoirs Classified as Dams by the State of California



resulted in more water being delivered to Arizona and less to California. In response to this event, MWD customers now receive additional supplies from the State Water Project. Currently, and notwithstanding the short term effects of the existing drought, there are no problems in meeting the City's water requirements. Future water supplies to the City will continue to be provided by the MWD, with augmentation from local groundwater wells. The City's system is capable of serving every household and business and a projected population of 225,000 people.

The impacts of future growth on Glendale's water supplies are, however, of concern in terms of total numbers and reference to the geographical distribution of that growth. Growth, in general, places additional demands upon water supplies and other natural resources. However, future growth in hillside areas of the city may have the effect of diminishing open space areas, which will in turn reduce percolation areas and the City's potential water supply.

f. Water Quality

In order to provide its residents with a safe and potable water supply and to meet all State water quality standards, the City has enacted an Urban Water Management Plan in compliance with Sections 10610-10656 of the California Water Code. The City also plans to increase the use of local supplies in the San Fernando and Verdugo ground water basins. This will reduce the City's demand on Metropolitan Water District (MWD) supplies.

The City's water supply consistently meets or exceeds the water quality standards established by State agencies and by the County Department of Health. Water quality is continuously monitored by the City and tested by private and County Health Department laboratories.

1. Sources of Pollution and Pollution Control

Traditionally the City's major source of ground water pollution has come in the form of nitrates from unsewered areas in the La Crescenta and La Canada Flintridge valleys. However, with the installation of sewer systems in this area during the 1980s, this pollution source is now under control. Other sources of pollution include direct ground water contamination from industrial and commercial uses as well as contaminants from paved surfaces and from construction site storm water runoff.

In late 1979, as a result of the passage of Assembly Bill 1803, the California Department of Health Services required all water agencies using groundwater to conduct

tests for the presence of certain industrial solvents. These tests indicated that substances such as trichloroethylene and perchloroethylene were present in the San Fernando Basin in concentrations exceeding State Maximum Contaminant Levels. As a result, the City decided to limit its use of local supplies and rely more heavily on imported supplies pending the decontamination of these water resources. Efforts are now underway to decontaminate the basin under Federal Superfund law.

In the Verdugo Basin, high nitrate levels were found. This, however, did not limit groundwater production in the Basin, since its water supplies are blended with water from the Metropolitan water delivery system. This blending provides water to the consumer that meets all state and federal drinking water quality standards.

The City is actively working with federal, state, and local agencies to correct the water quality problems in the San Fernando and Verdugo Basins. It is anticipated that, within the next few years, water treatment facilities will be constructed to remove contaminants from the groundwater. The water from this source will then meet federal and state drinking standards and be delivered to Glendale for use by its residents.

The City maintains an inspection staff to monitor the potential sources of ground water pollution. Storm water runoff is monitored through application of the National Pollutant Discharge Elimination System (NPDES) permit process as administered by the City of Glendale and the County of Los Angeles in accord with the guidelines of the California State Water Resources Control Board (SWRCB). The NPDES permit process applies to runoff from construction sites of five or more acres as well as businesses and industrial uses. The implementation of the permit system is an evolving process and involves the use and on-going revision of the best management practices (BMP) to control water pollution from these varied sources.

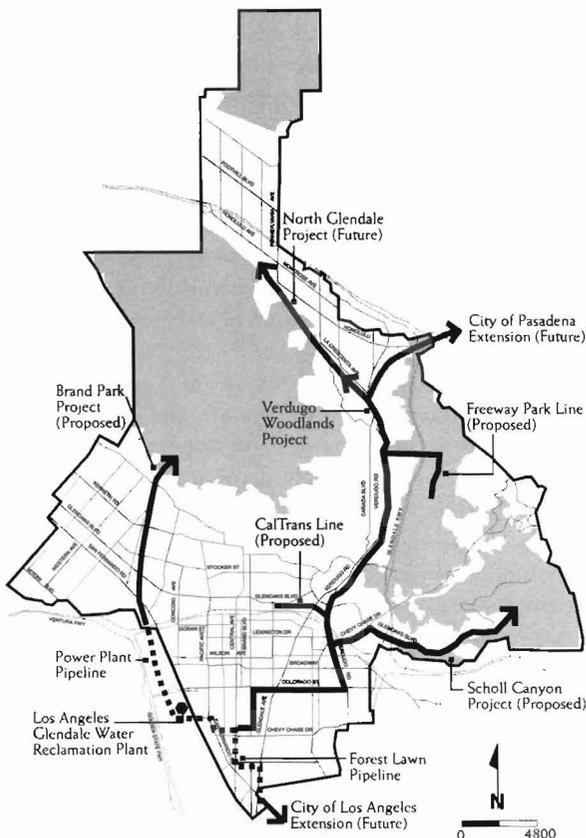
The City operates a hazardous materials collection facility. This program provides the opportunity for residents and businesses to safely dispose of toxic and hazardous materials. This program minimizes the illegal dumping or disposal of these hazardous materials in landfills, which provides protection against their introduction into underground water supplies. The City has also incorporated the County Hazardous Waste Management Plan into its Safety Element, setting policy for the proper siting and design of private and public hazardous waste facilities. The availability of sites locally would help reduce illegal disposal and the resulting groundwater pollution. A separate Household Hazardous Waste Element of the County Integrated Waste Management Plan

is under development by the Fire Division to provide a comprehensive approach to the proper separation and handling of household hazardous waste.

g. Water Reclamation

Glendale has become a leader in water reclamation and maintains a major water treatment and reclamation facility in partnership with the City of Los Angeles. The City has been delivering reclaimed waste water from the Los Angeles/Glendale Water Reclamation Plant to the Glendale Power Plant for use in the cooling towers and to Forest Lawn Memorial Park and CalTrans for irrigation. The City has a \$16 million program to construct a "back-bone" reclaimed water system to deliver reclaimed water to many other use sites in the City for irrigation of landscaped areas. By using reclaimed water for irrigation, there will be a reduction in demands on the drinking water supplies. By the year 2000, the City anticipates meeting 10 percent of its water demand through the use of reclaimed water. This program plus other local water resource programs are designed to reduce the City's dependence on imported water to improve the reliability of water supplies, and to reduce the extent of future water rate increases. Map 4-23 shows the City's reclaimed water system.

MAP 4-23 RECLAIMED WATER DELIVERY SYSTEM



h. Water Conservation

The City has implemented a broad range of water conservation and distribution management programs in coordination with programs at Federal, State and regional levels. These include the dissemination of information to consumers by means of a speaker's bureau, audio-visual presentations, literature handouts, newsletters, billing inserts and messages, exhibits, workshops, tours, advertising and coordination with local nurseries. In addition, the City encourages the use of drought tolerant vegetation and native gardens and has established a drought tolerant demonstration garden.

Water consumption also has been reduced by means of conservation audits to multi- and single-family residential as well as commercial customers, the distribution of conservation kits and the encouragement of the use of low-water use shower heads and plumbing fixtures. Lastly, the City is attempting to reduce system losses by means of leak detection, water main replacement, water meter testing, installation of pressure regulators and valve maintenance.

i. Water Programs Coordinated with Other Water Agencies

Much of Glendale's water comes from the Colorado River through participation in the Southern California Metropolitan Water District (MWD). This major water supply agency provides water to most southern California cities. Glendale is a charter member of this agency and enjoys continued use of its resources for domestic needs.

The Crescenta Valley County Water District provides some limited resources to selected areas of north Glendale. This district is also a member of the MWD. Its water resources are the Colorado River and springs in the San Gabriel Mountains. Its maintenance facilities are located in the Verdugo City area of Glendale.

7. Visual and Scenic Resources

a. Scenic Resources

1. Introduction

The characteristics of scenic or aesthetic resources can be categorized into a variety of components or functions. Some of the important aesthetic functions of open space are as follows:

- Scenic beauty, such as landscapes that contain lush or colorful vegetation or other features that are visually attractive on the basis of their appearance.



- Prominent stature, such as topographical relief features that are bold, highly visible or distinctive.
- Uniqueness such as physical features that are unusual or uncommon.
- Contrast or symmetry, such as landscapes with component features of high diversification or a consistently occurring pattern with an interesting visual effect.
- Identity and form, such as neighborhoods and historic resources, reflecting a sense of time and place within the history of the community.

2. Existing Urban Conditions

Glendale contains numerous landscaped medians, parkways, neighborhood open space and historic and cultural resources which contribute to the City's identity and character. In addition to these aesthetic resources, Glendale contains numerous park lands. The landscape treatment in these parks includes a variety of both introduced and exotic species as well as California native plants. Crescenta Valley Park and Verdugo Park are examples of facilities which display native plant species in their natural environment. In addition to publicly owned properties containing significant aesthetic resources, specimen trees are also found on private property. The City has established an indigenous tree protection ordinance which provides regulation of oaks and sycamores and other native species. It is important, however, to consider other significant trees for inclusion in this ordinance to ensure their protection. Examples of important specimen trees may include Moreton Bay figs and several varieties of non-indigenous palms found in both public parkways and on private property. As a result of Glendale's streetscape efforts, the City has been recognized as a "Tree City USA."

In summary, Glendale contains numerous important aesthetic and scenic resources in the developed portion of the community. These resources provide visual relief to Glendale's residents from urban activity and help link the built environment to Glendale's natural resources. It is important to encourage the retention of these features and to ensure that development is compatible with these resources. The City should continue to implement its streetscape program, design review program, create additional park facilities and recognize the importance of urban plazas and other open space features within the built environment.

b. Landforms/Topographical Resources

1. Introduction

The rugged ridges and canyons of the Verdugo Mountains, the San Rafael Hills and the San Gabriel Mountains are significant physiographical features within the City of Glendale. Encircled by an urban environment, these mountains provide islands of substantially untouched scenic landscape of near wilderness character. These landforms are important in that they create a dominant visual and physical resource that can be seen throughout the community. These open spaces provide a dramatic scenic backdrop for the community, helping to contribute to the city's image, character and identity. In addition, these expanses of open space contain important ecologically sensitive habitats also recognized as important resources to the community.

The City of Glendale, with the aid of other agencies, continues to recognize the importance of these resources as reflected in the accomplishment of an effective acquisition program. This commitment has also been made by the surrounding communities of Burbank, Los Angeles, and La Canada Flintridge. The Santa Monica Mountains Conservancy, established in 1980 and expanded in 1983 to include the Verdugo Mountains, San Rafael Hills and the San Gabriel Mountains as part of their planning jurisdiction, recognizes the scenic and recreational opportunities that these land forms provide the area. This organization, in concert with the National Park Service, is committed to fulfill its mandate to preserve the open space resources of the region. Los Angeles County also recognizes the Verdugo Mountains as an important resource through its identification of this area as a Significant Ecological Area (SEA). The California Department of Fish and Game also has identified these mountainous areas as containing significant biological resources and lists them in their Natural Diversity Data Base program.

Table 4-7 summarizes the amount of open space in Glendale which has been acquired by the City. More than 5,800 acres of land are now in public ownership. Only 1,540 acres remain in private ownership, available for future development (see Map 4-24). Although a substantial effort has been made to acquire and protect these lands, the remaining private properties are highly visible and contain sensitive ecological habitats including important stream channels and ridgeline areas. The biological investigation prepared for this report further stresses the importance of these remaining areas particularly in terms of their regional value to the overall ecological environment of the mountain system that surrounds the Los Angeles urban area.

**TABLE 4-7 OPEN SPACE ACQUIRED
BY CITY**

Open Space Acreage	
Developed Park Land	246 acres
Undeveloped Park Land	4,565 acres
Undeveloped Non-City Owned Open Space	1,296 acres
Undeveloped Privately Owned Open Space	1,540 acres
Total	7,647 acres

2. Existing Conditions

The Verdugo Mountains are a northwest-southwest trending lens-shaped series of ridges approximately nine miles long and varying from three to four miles in width. The mountains are separated on the north and northeast from the main body of the San Gabriel Mountains by extensive alluvial fans of the Sunland-Tujunga and La Crescenta areas. Bordering the Verdugo Mountains on the north is Big Tujunga Wash; on the south-southwest, the San Fernando Valley. On the east, the Verdugo Wash separates the Verdugo Mountains from the San Rafael Hills.

The San Rafael Hills are located east of the Verdugo Mountains and are bordered on the west by Verdugo Canyon and on the east by the Arroyo Seco. The alluvial fans of the La Canada Flintridge area separate the San Rafael Hills from the San Gabriel Mountains. The San Rafael Hills are approximately three and one-half miles wide and are nearly four and one-half miles long on their north-south axis. These hills are dissected by two distinct canyon areas: Scholl and Sycamore canyons. The Route 2 Freeway was constructed along the westerly edge of the San Rafael Hills. Development in the San Rafael Hills has been more extensive than that which has occurred in the Verdugo Mountains.

The City of Glendale includes approximately one square mile of land on the south face of the San Gabriel Mountains. This mountain range creates a dramatic backdrop for the entire Los Angeles region and is primarily occupied by National Forest lands. The City of Glendale boundary extends to just below Mount Lukens, which has an elevation of 5,074 feet.

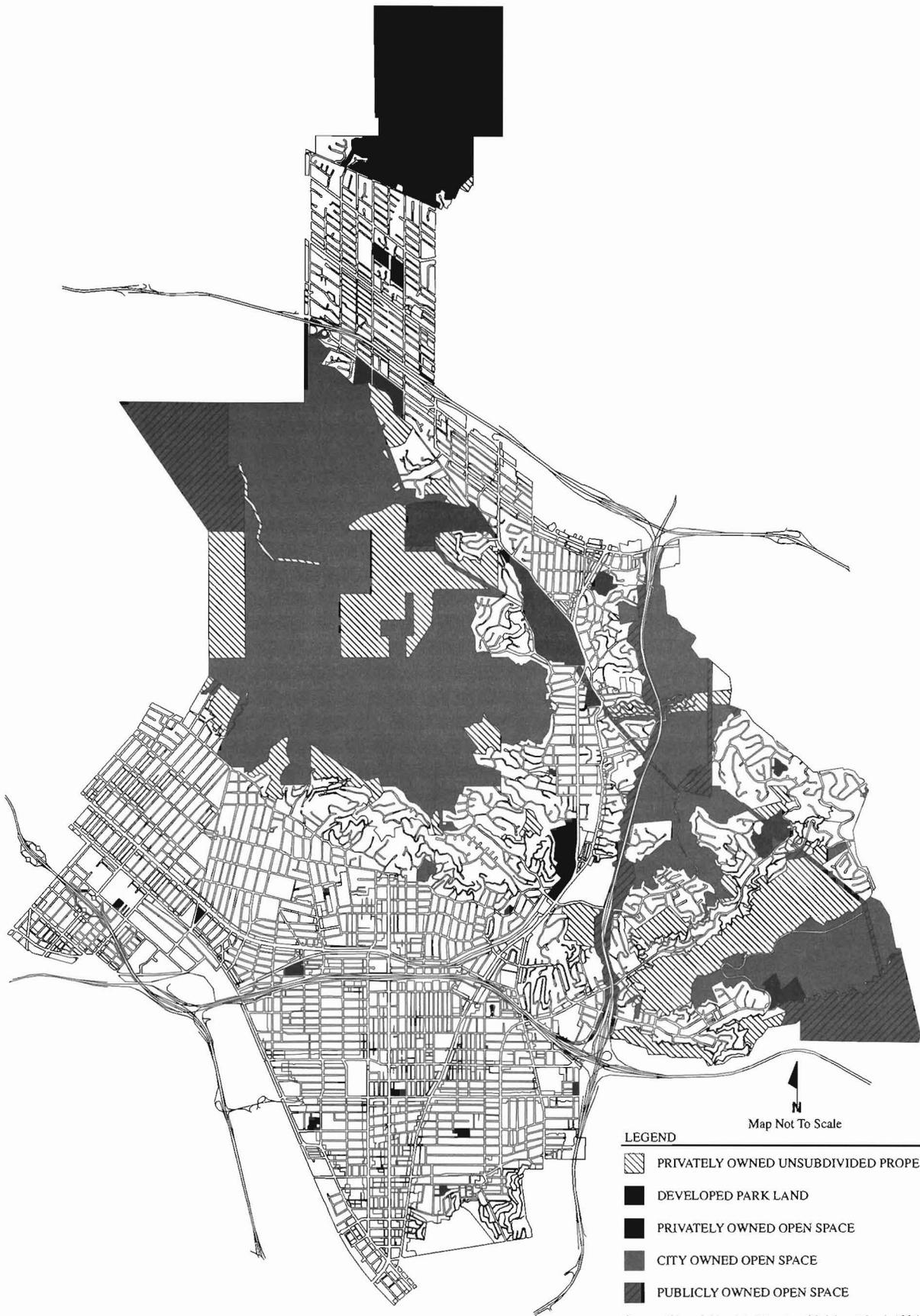
The topography of these mountainous areas is steep and well dissected by intermittent stream channels. The lowest elevation of these mountainous areas range from approximately 700 feet on the southerly portion to approximately 1,200 to 2,000 feet on the alluvial fan surfaces in the La Crescenta area. In the Verdugo Mountains, the highest elevation is Mount Verdugo (3,126 feet). Flint Peak rises to 1,887 feet, the highest elevation in the San Rafael Hills. The highest elevation of the portion of the San Gabriel Mountains located within the city is 4,774 feet above sea level. These wide ranges in elevation produce landforms that are unique in both variety and relief.

The most prominent physical features associated with these mountainous landforms are the ridgelines. These features provide a significant backdrop to the urban form and create an unique identity for the community. Ridgelines, by definition, are simply boundaries between drainage basins. They separate the direction of water flow during and following rain storms. They function, on a smaller scale, the same as continental divides which separate water sheds for large regions. In analyzing ridgelines it is important to establish a classification system that takes into account the degree of significance of each ridgeline. In the Verdugo Mountains the primary ridge and corresponding secondary ridges can be easily identified along the northwest-southeast trending axis. This, in a fundamental sense, represents the primary ridgeline feature of this landform. This ridgeline separates the water shed boundary of the San Fernando Valley from that of the La Crescenta Valley. This mountain range, however, is composed of numerous other ridgelines which provide separation between water sheds on smaller scales. The hydrologic section of the element provides further detail concerning the water resources of this area.

In the San Rafael Hills the overall ridgeline form is less definitive in that it is separated by numerous, well developed canyon areas such as Scholl Canyon and Sycamore Canyon. Within this area, however, the ridgelines can be readily identified. In the San Gabriel Mountains the primary trend of the landform is east-west and is located just outside the city boundary. Each of the major landform features within the City of Glendale portion are north-south trending ridgelines stemming from this main overall feature.

3. Ridgeline Definition

Ridgelines are the linear tops or crests of major hills that form a continuous horizon line against the sky or against other hillside features. The visual resources of ridgelines are represented by the aesthetic quality of these areas as



LEGEND

-  PRIVATELY OWNED UNSUBDIVIDED PROPERTY
-  DEVELOPED PARK LAND
-  PRIVATELY OWNED OPEN SPACE
-  CITY OWNED OPEN SPACE
-  PUBLICLY OWNED OPEN SPACE

Source: City of Glendale Planning Division, March 1996

a component of the region's viewshed as seen from off-site locations.

The major ridgelines can be further classified as either primary or secondary, as follows:

Primary Ridgeline: The highest undeveloped and visually dominant ridgeline in a viewshed, recognized by the continuous horizon line formed against the sky.

Secondary Ridgeline: Lower "branches" or "fingers" of the primary ridgelines which extend in different directions, or separate lower ridgelines that provide a visual foreground feature for primary ridgelines or form the boundary of a watershed.

Terrain, in general, can also be categorized based upon its visual sensitivity as follows:

- Areas of low visual sensitivity are defined as those areas screened or nearly screened from view from vantage points and/or without features of special visual interest. These areas are generally located in the low-lying interior of the city, in canyons and watersheds where local east-west and north-south ridges or existing development blocks views.
- Areas of moderate visual sensitivity include areas where local views are partially blocked by secondary ridgelines, middle and distant views are unobstructed and there are points of some visual interest. Such areas include foothill areas and steep slopes within watersheds and ridge faces.
- Areas of high visual sensitivity include areas that are in plain view of local, middle and distant viewsheds audiences. A majority of the areas included in the undeveloped areas of the City are within this sensitivity classification due to the high elevations of the mountains and hills. These areas are identified as major peaks, primary and secondary ridgelines and upper slopes.

4. Methodology

The visual resources of the mountainous areas were assessed through field investigation, topographical map review, and photographic interpretation analysis including low and high oblique aerial photography and at grade photography. These processes led to identification of site views, off-site viewsheds, and on-site points of visual interest. Various other resources were also reviewed including the biological investigation report and materials prepared by State, regional and other regulatory and planning agencies.

5. History of Ridgeline Preservation

In 1981, the City of Glendale established a ridgeline preservation ordinance (Ord. 4533) which prohibited development in conjunction with subdivisions on significant ridgelines. Maps 4-25, 4-26, 4-27 identify the generalized location of these ridgelines. The ordinance regulates development within these areas and provides an exception for public roadways and utilities subject to adoption of findings at a public hearing by City Council if found necessary for project implementation. Since 1981, numerous subdivisions have been developed involving landforms not identified by this ordinance. The community has indicated, during the processing of these subdivisions, that there is a need to recognize additional landform features in the community.

6. Proposed Ridgeline Identification

Maps 4-25, 4-26, and 4-27 identify the conclusions of the ridgeline analysis prepared by the Planning Division. Primary ridges are those that were previously identified and protected by City Council in 1981. The extensions of these ridgelines are classified as secondary ridgelines.

The areas identified within this ridgeline analysis represent important visual resources for the City of Glendale. The majority of this property is within public ownership and will be preserved in the future. There are areas, however, which contain privately held unsubdivided property and some subdivided property (see Map 4-24). Within those areas it is important that development proposals recognize these significant features and promote their preservation.

8. Mineral Resources and Aggregate Resources

a. SMARA Compliance

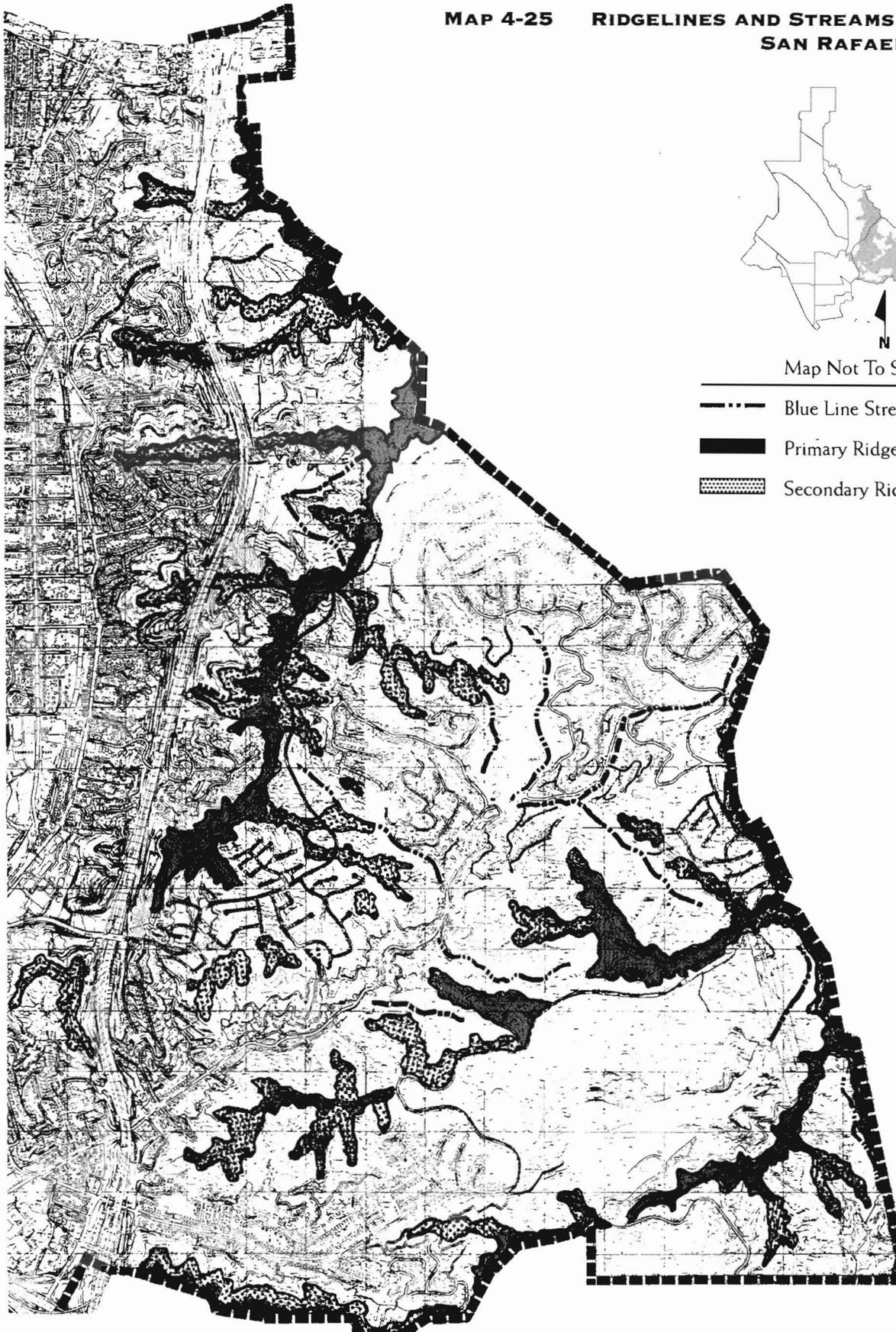
The Conservation Element is required to provide for the conservation, development and utilization of mineral resources. In addition, under the State's Surface Mining



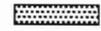
Ridgelines of the Verdugo Mountains as seen from MarkRidge Development



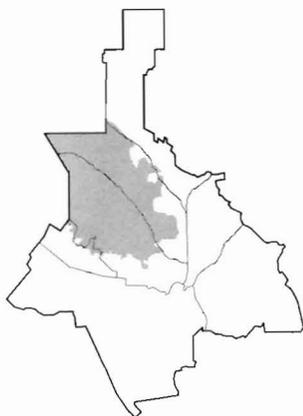
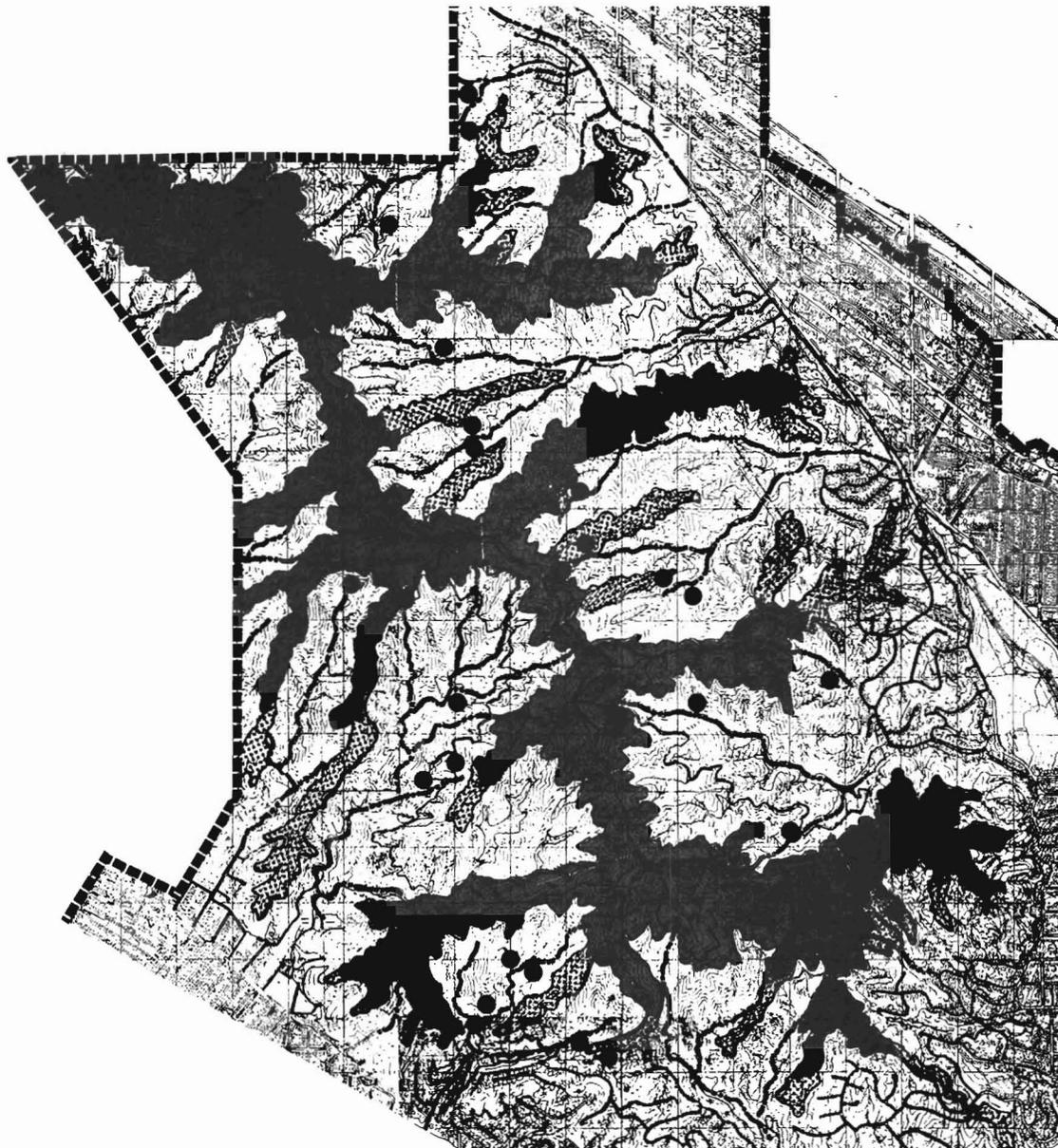
MAP 4-25 RIDGELINES AND STREAMS OF THE SAN RAFAEL HILLS



Map Not To Scale

-  Blue Line Streams
-  Primary Ridgelines
-  Secondary Ridgelines

RIDGELINES, STREAMS, AND SPRINGS OF THE VERDUGO MOUNTAINS

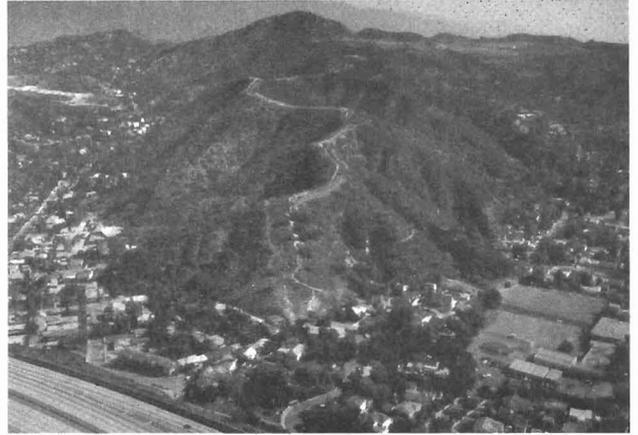
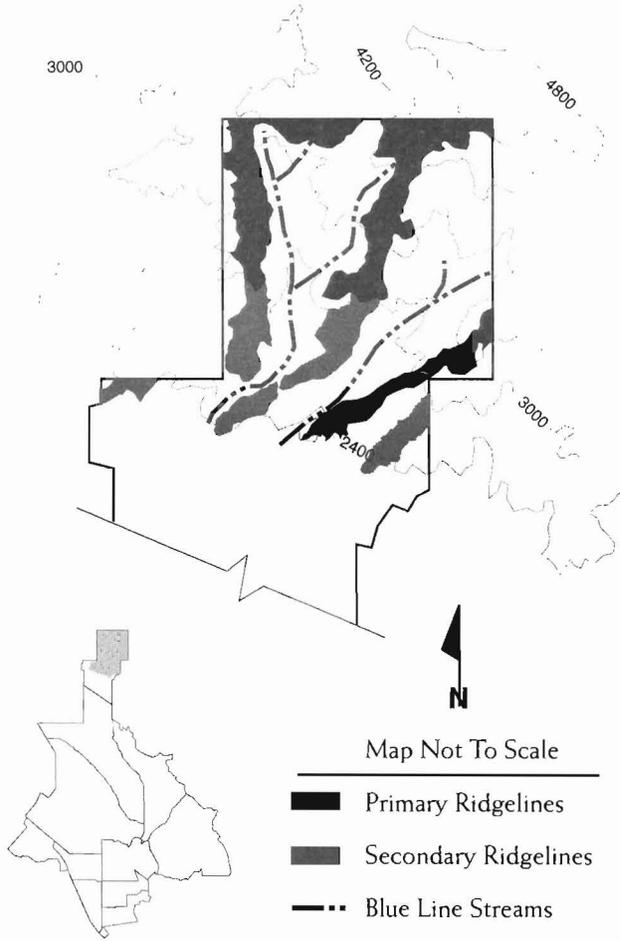


Map Not To Scale

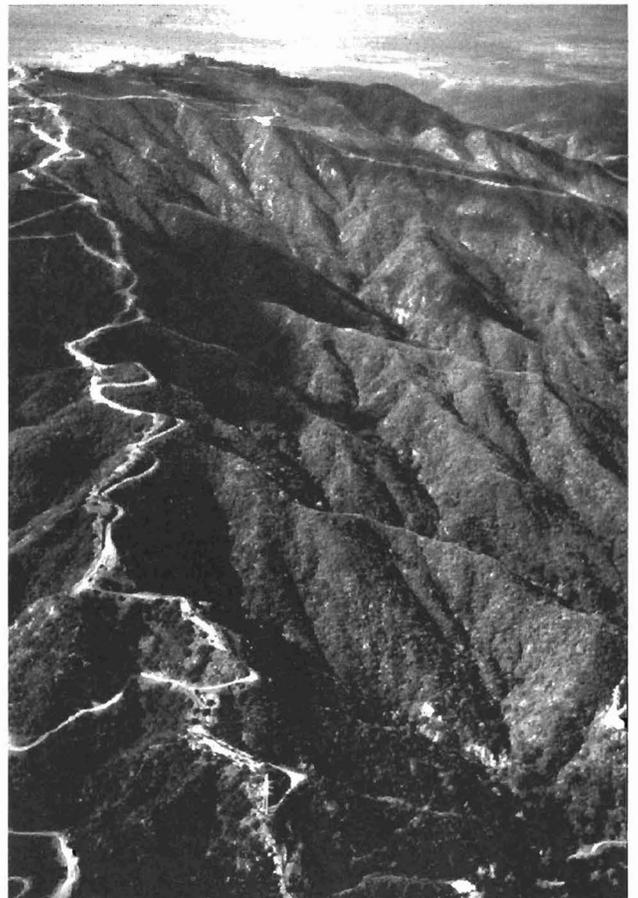
-  Blue Line Streams
-  Springs
-  Primary Ridgelines
-  Secondary Ridgelines



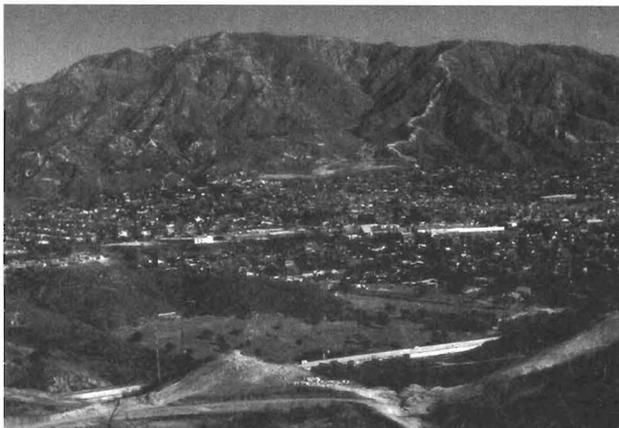
MAP 4-27 RIDGELINES AND STREAMS OF THE SAN GABRIELS MOUNTAINS



Ridgelines of the San Rafael Hills



Ridgelines of the Verdugo Mountains



Ridgelines of the San Gabriel Mountains

and Reclamation Act of 1975 (SMARA), each local agency is required to establish mineral resource management policies to be incorporated in its General Plan which will:

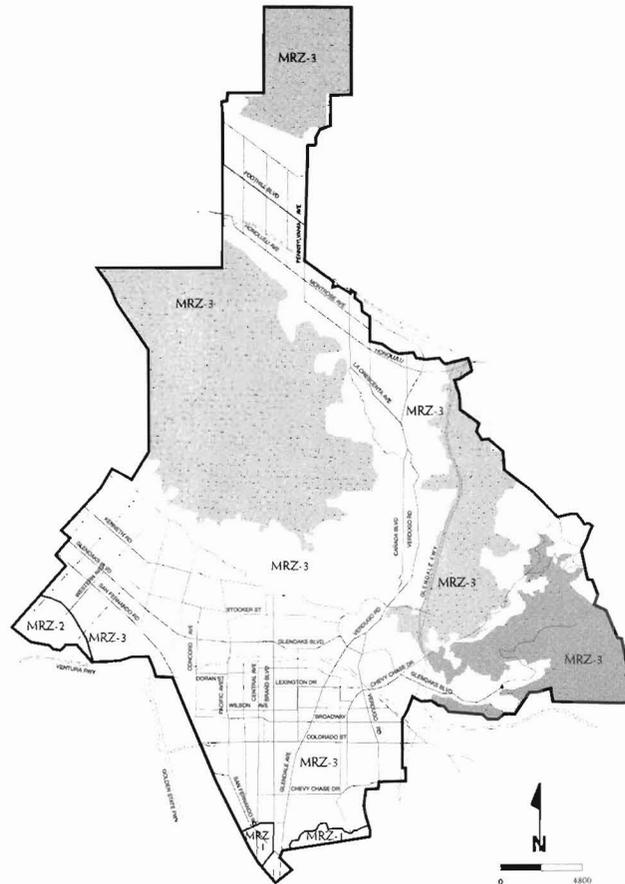
- (1) Recognize mineral information classified by the State Geologist and transmitted by the State Mining and Geology Board.
- (2) Assist in the management of land use which affects areas with mineral deposits of statewide and regional significance.
- (3) Emphasize the conservation and development of identified mineral deposits.

A mineral is defined in Public Resources Code Section 2005 as any naturally occurring chemical element or compound, or groups of elements and compounds, formed in inorganic processes and organic substances, including, but not limited to, coal, peat and bituminous rock, but excluding geothermal resources, natural gas and petroleum. Gold, sand, gravel, clay, crushed stone, limestone, diatomite, salt, borate, potash, etc. are examples of minerals.

The State Geologist has mapped the Glendale area for aggregate resources. Aggregate includes rock, sand and gravel. It is primarily used for construction and the manufacturing of concrete. Map 4-28 indicates mineral resource zones within Glendale as mapped by the State. As shown, no mineral resource zones in Glendale are of statewide or regional significance. An area along the Los Angeles River flood plain has been identified as containing a high likelihood for the presence of aggregate resources. The remainder of the City has not had sufficient information developed to determine the significance of any aggregate deposits.

Map 4-28 also shows the designated urbanized and urbanizing boundaries under SMARA. The area in Glendale with a high likelihood of aggregate resources is urbanized, thereby precluding resource development. Most other parts of Glendale are also urbanized. Aggregate resource development in areas of the City which are not urbanized or urbanizing would be visually detrimental. It would also be incompatible with the goals of the Open Space Element and the Land Use Element of the City's General Plan, which call for preservation of the visual character of Glendale's hillsides. Since aggregate is readily available and currently mined nearby in Lake View Terrace, Sun Valley and Irwindale, it does not appear likely that Glendale will have a need to develop its potential mineral resources.

MAP 4-28 AGGREGATE RESOURCES



Legend

- MRZ-1 Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that little likelihood exists for their presence
- MRZ-2 Areas where adequate information indicates that significant mineral deposits are present or where it is judged that a high likelihood of their presence exist
- MRZ-3 Areas containing mineral deposits the significance of which cannot be evaluated from available data

Source: California Division of Mines and Geology, Mineral Land Classification of the Greater Los Angeles Area Special Report 143, 1979

9. Source Reduction and Recycling

Two solid waste landfills are located within Glendale; Scholl Canyon Sanitary Landfill and Brand Park Landfill. The City owns 90 percent of Scholl Canyon Landfill with the remaining 10 percent owned by Los Angeles County. The landfill currently accepts approximately 2,300 tons of Class III (non-hazardous) refuse daily. It is expected to reach capacity by the year 2010. Cities and unincorporated areas that use the landfill for mu-



municipal waste disposal include Glendale, Pasadena, South Pasadena, Sierra Madre, La Canada Flintridge, San Marino, East Pasadena, Altadena and Montrose.

Brand Park Landfill is owned and operated by the City of Glendale. It accepts about 70 tons per day of asphalt, concrete, dirt, forestry and gardening waste, and street cleaning debris all from City operations. It is expected to reach capacity by 1995, unless the site is expanded as planned.

In an effort to extend the life of its landfills and comply with State law, the City adopted a Source Reduction and Recycling Element as part of the Los Angeles County Integrated Waste Management Plan. The element lists programs necessary to reduce solid waste by 25 percent by the year 1995 and by 50 percent by the year 2000. The programs include household and commercial refuse separation, materials recovery facilities, composting and other programs to meet the goals of the element. The Source Reduction and Recycling Element has been endorsed by the County. It awaits review and approval by the State Integrated Waste Management Board. This will take place when all cities within the County and the County have completed their individual elements and a Countywide Siting Element has been prepared.

