TECOLOTE CANYON NATURAL PARK

NATURAL RESOURCE MANAGEMENT PLAN

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CITY OF SAN DIEGO
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ACRONYMS AND ABBREVIATIONS

Basin Plan	Water Quality Control Plan for the San Diego Basin
BMI	Benthic macroinvertebrate
BMPs	Best management practices
CAC	Citizens' Advisory Committee
CalIPC	California Invasive Plant Council
Canyon	Tecolote Canyon
CDFG	California Department of Fish and Game
CDMG	California Division of Mines and Geology
CDP/SDP	Coastal Development Permit/Site Development Permit
CEQA	California Environmental Quality Act
cfs	Cubic feet per second
CGS	California Geological Survey
City	City of San Diego
CNDDB	California Natural Diversity Database
Corps	U.S. Army Corps of Engineers
CRMP	Cultural Resource Management Plan
CWA	Clean Water Act
Dudek	Dudek & Associates, Inc.
DWR	California Department of Water Resources
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
General Plan	City of San Diego's Progress Guide and General Plan
HA	Hydrologic Area
HELIX	HELIX Environmental Planning, Inc.
HU	Hydrologic Unit

I-5	Interstate 5
Master Plan	Tecolote Canyon Natural Park Master Plan
MEC	MEC Analytical Systems, Inc.
MHPA	Multi-habitat Planning Area
MLS	mass loading station
MMRP	Mitigation, Monitoring and Reporting Plan
MSCP	Multiple Species Conservation Program
NCCP	California Natural Communities Conservation Planning
NPDES	National Pollutant Discharge Elimination System
NRMP	Natural Resource Management Plan
Park	Tecolote Canyon Natural Park
Program EIR	Final Program Environmental Impact Report for a Proposed Canyon Sewer Cleaning Program and Long-Term Sewer Maintenance Program
RWQCB	San Diego Regional Water Quality Control Board
SCS	U.S. Soil Conservation Service
SDCWA	San Diego County Water Authority
SDG&E	San Diego Gas and Electric
SWRCB	State Water Resources Control Board
TCNP	Tecolote Canyon Natural Park
Tierra	Tierra Environmental Services
TMDL	Total maximum daily load
USD	University of San Diego
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

1.1 Setting

Tecolote Canyon Natural Park (Park) is an open space area located within a narrow coastal valley in the City of San Diego (City), 0.5 mile to the east of Interstate 5 (I-5) and 0.8 mile to the east of the Pacific Ocean (Figure 1, *Location Map*). The approximately 950-acre Park is 5.0 miles long in a generally north-south direction and up to 0.5 mile in width. It has about 6.5 miles of trails that can be used for jogging, walking and mountain biking, as well as passive recreational activities such as wildlife viewing. The Tecolote Canyon Golf Course (an 18-hole public golf course, which is currently under lease from the City until 2022) is situated in the central portion of the Park. The majority of the Park is located in the community of Clairemont Mesa, with the southeastern portion of the Park in the community of Linda Vista.

The mouth of the canyon is located at Tecolote Community Park, south of Tecolote Road. Tecolote Nature Center and main entrance into the Park are located near the mouth of the canyon. The University of San Diego (USD) is located adjacent to the southern boundary of the Park. The northern tip of the canyon is located at North Clairemont Recreation Center, south of Bannock Avenue. Genesee Avenue and Linda Vista Road form the Park's eastern boundary. The top of the steep slope parallel to Clairemont Drive and Cowley Way forms the western boundary of the Park.

The vast majority of the Park (approximately 926 acres) is owned by the City. San Diego Gas and Electric (SDG&E) owns approximately 24 acres (the remainder) of the Park. An SDG&E right-of-way running north-south bisects the southern portion of the Park. As part of the development of the Tecolote Canyon Natural Park Master Plan, SDG&E had no objections to designating the SDG&E right-of-way through the Park planning area as 'Natural Park', as long as the designation does not restrict SDG&E's ability to develop and maintain the facilities within the right-of-way (Tecolote Canyon Citizens' Advisory Committee [CAC] 1982). Several roads also divide the Park including Mount Acadia Boulevard, Snead Avenue (which leads to the golf course), Boyd Avenue and Balboa Avenue (Route 274). Mount Acadia Boulevard and Balboa Avenue both cross the Canyon on fill material, with large culverts allowing for drainage. Snead Avenue is located along the floor of the Canyon, and Boyd Avenue is cut into the Canyon slope. Although the Park is divided by an SDG&E right-of way and roads, the study area for the Tecolote Canyon Natural Park Natural Resource Management Plan (TCNP NRMP) includes these rights-of-way.

1.2 Purpose

The purpose of the TCNP NRMP is to provide guidance for the management, maintenance, utilization and development of the Park while preserving the Park's natural and cultural resources. This TCNP NRMP is intended not only to make provisions for the protection and preservation of natural and cultural resources, especially sensitive resources, but also to allow safe and accessible use of the Park to meet the needs of the surrounding communities. The TCNP NRMP provides for the maintenance and preservation of the Park's natural environment and associated visual enjoyment of the Park's open space.

A major goal of this TCNP NRMP is to demonstrate the recognition by the City and the public of the biological and cultural resources existing in the Park. This Plan is intended as a tool to protect resources while accommodating certain human activities in the Park. This TCNP NRMP highlights

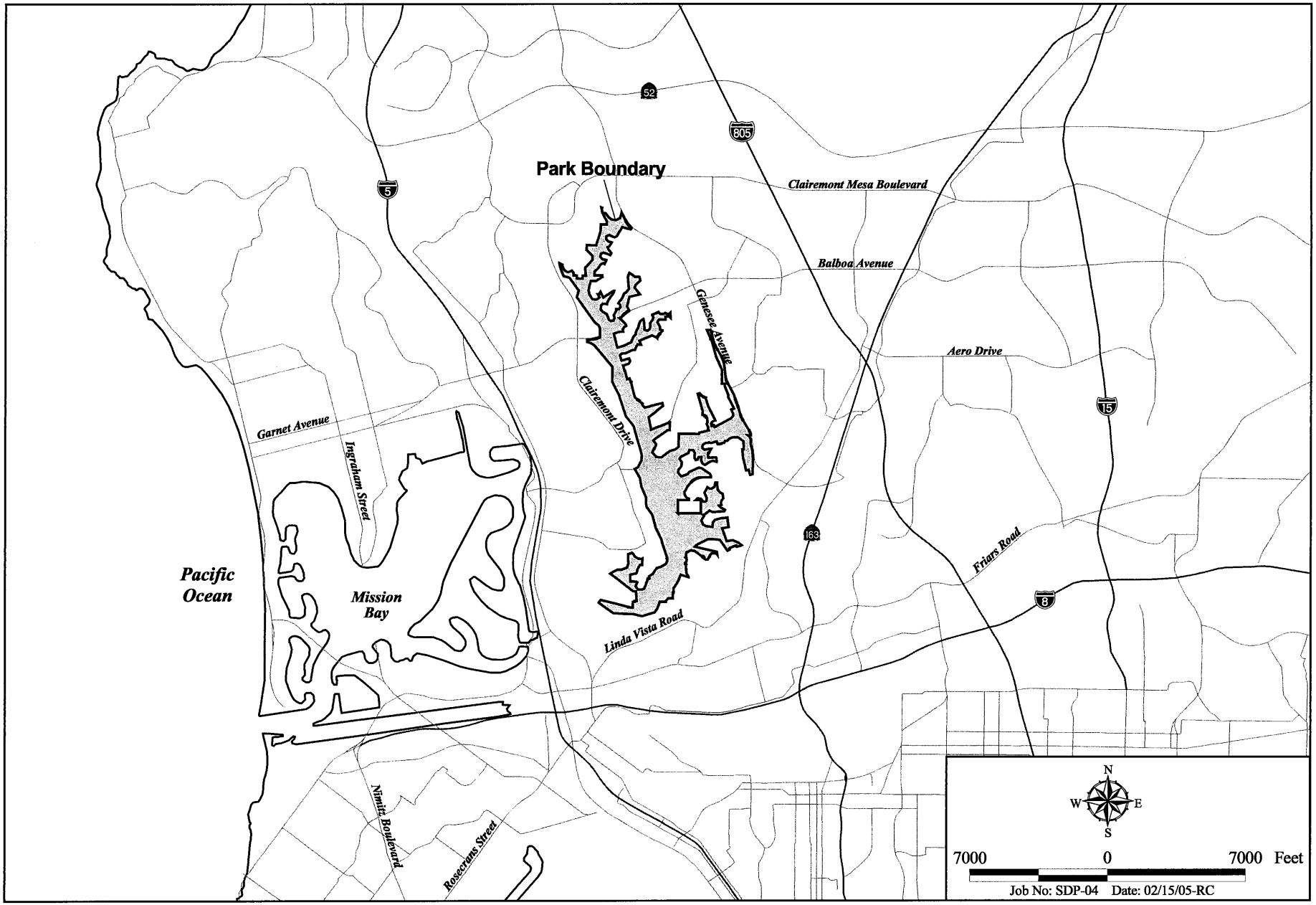
the hiking, bird-watching, educational and aesthetic enjoyment provided by these resources and recognizes them as an integral part of the regional open space system.

The purpose, goals and objectives of the TCNP NRMP are established as long-range, 100-year goals with periodic reviews. The guidelines outlined in the TCNP NRMP are intended to be updated at least every ten years, or as needed, with input from the City, Tecolote Canyon CAC, Friends of Tecolote Canyon, San Diego County Archaeological Society and applicable resource agencies as identified in Section 2.1.

1.3 Objectives

The objectives of the TCNP NRMP are:

1. To establish management practices and means for implementation that will foster preservation and protection of cultural and biological resources while providing for ongoing passive and active recreational use, maintenance and land use in the Park;
2. To enhance and restore native habitats in the Park;
3. To manage native plant and wildlife species for their survival;
4. To identify and maintain important wildlife corridors and the connectivity between open space areas;
5. To ameliorate the effects of past, and control future, erosion and sedimentation throughout the Park and protect the watershed;
6. To protect and maintain paleontological and archaeological resources;
7. To protect, restore and maintain historical resources;
8. To conduct education, outreach and research programs that increase public awareness of the unique natural and cultural resources within the Park;
9. To facilitate public use in the Park that is compatible with the protection and preservation of the natural and cultural resources, such as multi-use trails and other low-intensity recreational activities;
10. To develop and implement measures that ensure compatibility of existing land uses within and/or adjacent to the Park with natural resources;
11. To enhance and maintain the quality of water resources in the Park;
12. To ensure all individual projects proposed within the Park meet federal, state and local environmental standards and requirements;
13. To minimize illegal and unauthorized activities through enforcement actions and procedures and cultural resource management;
14. To develop a reporting and enforcement procedure for preventing encroachment into Park property;
15. To develop and maintain facilities that are compatible with the natural character of the Park;
16. To develop procedures for City facility and utility siting, maintenance and repair that are sensitive to species, habitat and aesthetics;



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Location Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 1

17. To develop response procedures for unexpected public health and safety emergencies that safeguard sensitive species and habitat; and
18. To ensure that all improvements and maintenance activities consider and provide for public safety.

1.4 Park History/Background

The Park was established to provide and protect an open natural area, in perpetuity, near the geographic center of the City. As a resource-based park, Tecolote Canyon exhibits distinctive natural and cultural resources and is intended for regional use. Due to its location, it affords a unique opportunity for visitors to experience a relatively natural environment in an urban setting.

Tecolote Canyon has been designated as a cartographic feature on area maps since 1845, when the first map was made for the pueblo of San Diego. The word "tecolote," meaning owl, is still used in the Spanish language today and scholars hold that it has an Aztec root. The Canyon is said to have been named after the flourishing owl population that used to inhabit the Canyon; however, one researcher suggested that the name may have referred to certain vines that grew in abundance in the Canyon (Davidson 1936).

Indications of early Kumeyaay Indian occupation at the mouth of the Canyon reportedly date back 2,500 years. It is believed that the first European settler in Tecolote Canyon was Judge Hyde, who built a house about 1.5 miles from the mouth of the Canyon and began farming in the Canyon around 1872. Farming and ranching within the Canyon continued through World War II, and cattle continued to graze in the Canyon as late as 1953.

From the first settlements in San Diego, Tecolote Canyon had remained in private ownership and was generally undeveloped, except for the farm buildings on the broad plain at the month of the Canyon. In the 1940s, the City of San Diego began expanding northward and housing was built on the mesas and along the Canyon rim, forming the communities of Clairemont Mesa and Linda Vista. In 1957, the residents of these communities protested the City's plans to open a sanitary landfill in Tecolote Canyon and the plan was subsequently abandoned.

In the 1960s, as land for development became scarce within the City, builders proposed housing and a major four-lane road on the floor of the Canyon, which was zoned for single-family residences. The Fireside Park Homeowners Association successfully defeated a plan to build high-density multiple residential units that would have stair-stepped down the Canyon slopes.

Tecolote Canyon Golf Course was constructed in the central portion of the Canyon in 1964. In the mid-1960s, community planning groups were formed throughout the City as a vehicle for citizen input as required for Housing and Urban Development programs. The Kearny Vista Planning Committee (now called Linda Vista Community Planning Organization) and Clairemont Mesa Development Committee (now called Clairemont Mesa Planning Committee) agreed from the outset that Tecolote Canyon, their common community boundary, should be preserved as open space. Representatives from these planning groups formed a Joint Advisory Board and launched a movement to persuade the City Council to enact legislation enabling the formation of a park district to preserve Tecolote Canyon as an open space park. In 1969, the City Council adopted the Park Procedural Ordinance. The initiation of the Park District was pursued for several years by the planning groups,

the Joint Advisory Board for Open Space and several allied "ad hoc" groups, including Citizens to Save Open Space, Georgetown Homeowners Association and Tecolote Canyon Protective Association.

The intense lobbying resulted in the initiation of the Park District by a unanimous vote of the City Council in January 1971. Two finger canyons were deleted from the original district and a borrow pit permit was allowed to stand. The District was formed in July 1974. A legal challenge to the Park Procedural Ordinance was filed but the ordinance was upheld by the courts. Land within the District was acquired and the Dedication Ordinance was adopted in November 1977. A dedication ceremony was held on April 1, 1978, where the park was officially named Tecolote Canyon Natural Park and the first members of the Tecolote Canyon CAC were sworn in. The duties of the Tecolote Canyon CAC included the preparation of the *Tecolote Canyon Natural Park Master Plan* (Master Plan) for the Park, which was completed in December 1982. On May 24, 1983, the City adopted the Master Plan, which currently serves as the primary planning document for the Park.

The Tecolote Canyon Nature Center was constructed near the mouth of the Canyon and was opened in July 1994. The Nature Center serves as the main entrance into the Park. Ground was broken for expansion of the Nature Center on September 29, 2003 and work was completed about a year later. The expanded Nature Center includes exhibits featuring the biological and cultural resources of the Park, a classroom for school field trips and lectures, and staff offices. A native plant garden and Kumeyaay Village currently are under construction adjacent to the Nature Center. These facilities offer visitors educational opportunities in addition to the recreational opportunities available within the Park.

2.0 AGENCY JURISDICTION AND APPLICABLE PLANS

2.1 Agency Jurisdiction

A number of agencies have direct or indirect involvement with land use planning, resource protection and permit approvals for the Park. The primary agencies and their degrees of involvement with activities in the Park are as follows:

City of San Diego

The day-to-day management of the Park is the responsibility of the Park and Recreation Department, operating under the authority of the City Manager. The Park presently is managed through the Park Ranger Program. The Open Space Division of the Department performs tasks such as trash removal, maintenance of physical structures (i.e., fences, restrooms, signs and trails) and brush management. Additionally, this division provides park rangers, whose primary responsibilities include enforcement of City and State regulations; oversight of enhancement and restoration efforts and interpretive activities; and coordination with volunteers. The Park and Recreation Department also has a Natural Resources Management Section, whose primary purpose is the protection and management of environmental resources within the City's natural parks and open space.

The Development Services Department's involvement is focused on the permitting and environmental review process. Any individual project proposed within or adjacent to the Park is required to meet the regulations outlined in the following applicable plans, ordinances and laws: Master Plan, Land Development Code, *City of San Diego Multiple Species Conservation Program Subarea Plan* (MSCP Subarea Plan), applicable community plans, *City of San Diego Progress Guide and General Plan* and City environmental and construction standards and requirements. Agencies and the public become involved with individual project proposals during this process. For projects requiring permitting, the Development Services Department serves as a liaison between the City, public and agencies. The MSCP Division of the Planning Department is also responsible for collecting and monitoring data on target species and coordinating with the Park and Recreation Department on activities related to those target species. Other City departments involved in the Park include the Police, Fire-Rescue, Engineering and Capital Projects, Water, General Services (Streets Division) and Metropolitan Wastewater departments. The Streets Division is responsible for maintaining concrete-lined channels and 10 feet from the outlet of all storm drains.

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (Corps) exercises permit authority for projects that require permits under Section 404 of the Clean Water Act. Projects that involve the discharge of fill or dredge material into waters of the United States must secure a Section 404 permit. Some activities within the Park may require an individual or nationwide 404 permit. The Corps would need to be consulted for a determination on an individual project's need for a Corps permit.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) acts in an advisory role with projects requiring a Corps or City permit. The USFWS also serves other permitting agencies in an advisory capacity. Of particular

importance to the USFWS is the status of plants and animals on the List of Endangered and Threatened Species, which are protected under the federal Endangered Species Act of 1973. The USFWS is also concerned with protecting bird species covered by the Federal Migratory Bird Treaty Act of 1916, as amended in 1994. The USFWS has signed an Implementing Agreement with the City for the MSCP Subarea Plan.

California Department of Fish and Game

Involvement of the California Department of Fish and Game (CDFG) can occur in three ways. For projects involving alteration of a streambed, a permit must be issued pursuant to Section 1602 of the State Fish and Game Code. The second type of involvement would occur when the CDFG serves in an advisory capacity to the City. The third area of involvement relates to plants and animals on the California List of Endangered or Threatened Species, which are protected under the California Endangered Species Act. The CDFG is a signatory of the MSCP Implementing Agreement for the MSCP Subarea Plan.

State Water Resources Control Board/Regional Water Quality Control Board

Activities proposed within the Park may be subject to one or more National Pollutant Discharge Elimination System (NPDES) permitting requirements from the State Water Resources Control Board (SWRCB) and/or the San Diego Regional Water Quality Control Board (RWQCB).

Conformance with the NPDES *General Permit For Storm Water Discharges Associated With Construction Activity* (Construction Permit, NPDES No. CAS000002, SWRCB Order No. 99-08-DWQ), would be required for any future activity disturbing one acre or more within the Park, and would be administered by the SWRCB. Such conformance would involve (among other requirements) the implementation of best management practices (BMPs) to address issues including construction-related erosion/sedimentation and hazardous material use. Long-term activities/facilities may be subject to conformance with the NPDES *Waste Discharge Requirements For Discharges of Urban Runoff From the Municipal Separate Storm Sewer Systems* (Municipal Permit, NPDES No. CAS0108758, RWQCB Order No. 2001-01). Conformance with the Municipal Permit typically entails the use of applicable site design, source control and treatment control BMPs, and is administered by the RWQCB. Proposed activities involving the disposal of groundwater extracted during construction (if applicable) would be required to conform with the NPDES *Waste Discharge Requirements For Groundwater Extraction Waste Discharges From Construction, Remediation, and Permanent Groundwater Extraction Projects to Surface Waters Within the San Diego Region Except for San Diego Bay* (Groundwater Permit, NPDES No. CAG919002, RWQCB Order No. 2001-96). Conformance with the Groundwater Permit typically entails the use of BMPs related to (for example) erosion/sedimentation and treatment control, and is administered by the RWQCB.

All of the above-described permitting activities are intended to ensure conformance with applicable regulatory requirements, including the federal Clean Water Act, State Porter-Cologne Water Quality Control Act and the RWQCB Water Quality Control Plan for the San Diego Basin (Basin Plan). Additional requirements under these (and/or other) regulatory controls may also be applicable to the proposed TCNP NRMP (e.g., conformance with Basin Plan beneficial uses and water quality objectives).

2.2 City Plans Applicable to Tecolote Canyon Natural Resources

Tecolote Canyon Natural Park Master Plan

The main purpose of the Master Plan, adopted by City Council in 1983, is to define the guidelines for the optimum development and use of the Park. The Master Plan recommends minimal development to accommodate activities compatible with the natural character of the Park and provides objectives, critical issues, standards and recommendations, and short- and long-term guidelines for the Park.

The Master Plan presented the following objectives that its implementation should accomplish:

- Provide an accessible natural park to meet the needs of City residents, especially those nearby the Park (within Clairemont Mesa and Linda Vista);
- Establish criteria and guidelines for the development of rim properties;
- Preserve the Canyon slopes, thus ensuring their stability and natural form, and further protect hillsides and natural areas from damage by off-road vehicles;
- Preserve the natural creek, which supports vegetation and wildlife;
- Plant native species in depleted areas for erosion control and restoration of areas disturbed by construction or grading;
- Preserve the open space to provide visual enjoyment as well as to protect the natural habitat; and
- Establish a maintenance program within the Park to preserve quality open space.

The Master Plan identifies four critical issues including off-road vehicular activity, illegal dumping, erosion and pollution, and "feral" plants (i.e., non-native, invasive plants), and provides recommendations to resolve these issues. Recommendations include informing the public of the existence and purpose of the Park by (1) boldly depicting the Park on City departmental and commercially sold City street maps, (2) placing signs with the Park name at access points and on the periphery of the Park, (3) constructing a visitor center at the primary entrance into the Park (at the eastern terminus of Tecolote Road), and (4) building secondary self-service visitor centers at other entry points. The first three proposals have been achieved; however, the fourth proposal has not yet been completely fulfilled. Signs are currently posted at many locations around the Park including most access points. The Nature Center, which was completed in 1992 at the primary entrance, features exhibits with resident plant and wildlife information and provides visitors with Park maps, trail information and rules and regulations. An expansion of the Nature Center was completed in Fall 2004.

The Master Plan proposes the following management measures:

- Construction of adequate barriers at all access points to exclude off-road vehicles and motorcycles, but would permit entry of emergency, law enforcement and maintenance vehicles as needed;
- Increased enforcement of the laws relating to off-road vehicles, protection of park flora and fauna and fire regulations;
- Removal of trash and restoration of areas used as illegal dumpsites;
- Completion of a comprehensive program of environmental studies to identify other needed corrective measures;
- Erosion control measures and siltation management;

- Construction of decomposed granite roads that are environmentally inconspicuous, but would serve as an emergency and maintenance network;
- Installation of fire hydrants within the Park at strategic locations if required by the Fire-Rescue Department;
- The development of Goldboro Canyon (in the southwestern portion of the Park) as a native plant preserve; and
- Control of undesirable non-native, invasive plants.

In addition to management of the Park itself, the Master Plan presented criteria to be used in review of any development proposed along the rim of the Canyon. It also contained recommendations to minimize hazards to adjacent property owners associated with erosion, fire hazard, trail placement and pest control.

Progress Guide and General Plan

The *Progress Guide and General Plan* (General Plan; City 1979, amended 1989) designates most of the Park as "(7) Resource Based Park," with the remaining sections designated as "(8) Open Space." The General Plan currently is being updated and is tentatively scheduled to be adopted by the City Council in 2007. The Recreation Element of the General Plan recognizes that recreation is one of the primary uses of open lands and that resource-based parks are a major part of the City's open space system. Recreation Element goals applicable to the Park area include:

- Provide a range of opportunities for active and passive recreation, educational activities and neighborhood identification in all parts of the City, adapted to the needs and desires of each neighborhood and community; and
- Enhance the urban scene by development of an extensive and varied system of open space and recreation facilities.

The goal of the Open Space Element of the General Plan is to "establish an open space system which provides for the preservation of natural resources, the managed production of resources, the provision of outdoor recreation, the protection of public health and safety, and the utilization of the varied terrain and natural drainage systems of the San Diego community to guide the form of urban development."

The Urban Design Element of the General Plan recommends preserving the rural character of undeveloped canyons by limiting development to mesas and less sensitive areas of canyons and protecting the hillsides and rims. This also will help prevent erosion and flood damage to the canyon. If development occurs, sensitive development that will complement the natural character of hillsides and relates well to the regional open space system should be encouraged. Structures should be set back from canyon rims and environmental resources and significant public views must be protected. Recontouring is suggested, rather than using a cut and fill approach, when earthmoving is required.

Clairemont Mesa Community Plan

The *Clairemont Mesa Community Plan* (City 1990) identifies single-family residences as the primary land use surrounding the Park within the community of Clairemont Mesa. Several schools and parks also occur in the area, as well as multi-family residential areas. Limited amounts of commercial areas are

located nearby the Park. One commercial area, Garfield Plaza, is located adjacent to a small branch of the Park, at Clairemont Drive and Balboa Avenue. Figure 2, *Planned Land Use*, shows the land uses planned adjacent to the Park (most of which are built out).

The Community Plan states that all new public improvements should minimize the visual and physical impacts to the Park. New development should protect environmental resources and aesthetic qualities of the area by clustering development on the flatter portions of sites and minimizing grading to preserve natural landforms and vegetation. If lots are subdivided, houses should be built along the street, rather than behind or below existing houses.

Most of Clairemont Mesa is subject to a 30-foot height limit. This includes the areas surrounding the Park, with the exception of a 40-foot height limit in the area to the west of the Park between Clairemont Community Park and Clairemont Village shopping center. This height limit is intended to maintain the low-scale character of the community and preserve public views to Mission Bay and the Pacific Ocean.

The *Clairemont Mesa Community Plan* identifies issues of concern to the community including one issue that directly relates to the Park: the need to eliminate and prevent future contamination of Tecolote Creek by urban pollutants and to reduce and prevent siltation.

Objectives with regard to the Park include the following:

- Preserve and enhance the Park;
- Reduce runoff and the alteration of the natural drainage system;
- Minimize the damage to Tecolote Creek by urban pollutants, erosion and siltation;
- Protect the resource value of the Canyon including plants and wildlife;
- Establish residential development guidelines in areas adjacent to the Park;
- Prevent residential landscaping from modifying biological resources by utilizing non-invasive plant species compatible with native vegetation; and
- Protect the resource value of artifacts and paleontological remains and the community's heritage for future generations.

Many unimproved streets, alleys and public right-of-way easements occur in the older neighborhoods of Clairemont Mesa, particularly those adjacent to the Park. These rights-of-way provide public access and viewing areas to the Park. Although the City often receives applications to close or vacate them in order to increase adjacent lot size, the *Clairemont Mesa Community Plan* recommends the consideration of maintaining such rights-of-way as pedestrian, bike and service access as well as public viewing areas to the Park.

According to the Community Plan, Tecolote Canyon is considered a priority one area by the Fire-Rescue Department. Priority one areas consist of steep, northeast-facing slopes with vegetation. Several brush fires have occurred within the Park since 1976. Fires in the Canyon are difficult to control because of dense native, drought-resistant vegetation, steep slopes and wind patterns that create changes in temperature. Residents adjacent to the Park are required to thin brush from their property during brush management to prevent impacts from fire. The community plan recommends that construction materials such as fire retardant roofing materials and stucco siding be used. Site

design features such as nonflammable walls and swimming pools should be considered as barriers when feasible.

Linda Vista Community Plan

Planned land uses that are largely built out adjacent to the Park within the community of Linda Vista include several community and neighborhood parks, single and multi-family residential areas, a mobile home park and two schools, including USD (Figure 2, *Planned Land Use*).

The *Linda Vista Community Plan* provides specific goals and policies with regard to the Park. Goals for the Park include the following:

- Preserve Tecolote Canyon and its tributary canyons as open space;
- Protect public views to and from the Park and ensure that development adjacent to the Park is visually compatible with the Park's natural state; and
- Preserve the remaining undeveloped canyons and slopes of Linda Vista to allow public use and enjoyment of these areas.

Policies for the preservation and protection of the Park within the *Linda Vista Community Plan* include:

- Designate remaining undeveloped canyons and slopes as open space;
- Preserve sensitive resources;
- Incorporate sensitive grading techniques into new development adjacent to the Canyon. Development should be set back from the rim, provide breaks between structures and, if visible from the Canyon, maintain a low profile. Building materials should blend with the Canyon; and
- Cluster new development outside of areas designated for open space.

The *Linda Vista Community Plan* (City 1998) states that grading and development of canyons designated as open space should be avoided; however, guidelines are provided when grading and development are necessary to provide reasonable use of private property. Guidelines to minimize impacts to the Park from adjacent development include sensitive grading techniques (e.g., minimizing grading of slopes exceeding 25 percent and contouring graded areas to a slope not exceeding a 2:1 ratio, building design (e.g., low profile and angled to follow the Canyon rim), site design (e.g., setting structures back from the Canyon rim and minimizing hardscape) and landscape design (e.g., planting disturbed slopes with native, drought-tolerant species). The natural surface drainage system of hillside sites should be maintained and hardscape should be minimized in order to minimize runoff onto the slopes of the Canyon. The community plan also recommends that development on USD should not encroach into designated open space and should respect and maintain scenic hillsides and sensitive vegetation.

Tecolote Canyon Rim Development Guidelines

The guidelines set forth in the Tecolote Canyon Rim Development Guidelines (City 1987) are to be used in the area adjacent to Tecolote Canyon only. The intent of this document is to assure that development along the rim of the Canyon occurs in such a way that native habitat within the Canyon is enhanced and protected from damage associated with development. The document provides guidelines for structures, traffic circulation, grading, drainage, landscaping and fire protection.

Planned Land Use

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 2

Structures should be low profile, set back or staggered from the Canyon rim to avoid a "wall effect," angled at varying degrees to follow the rim and built with materials that blend (color and texture). Grading should not occur in the Canyon; however, if grading does occur, disturbed areas should be repaired to blend with natural slopes and contours and revegetated with native plants. Grading should not occur during the rainy season, between October 1 and April 1. Natural runoff patterns and water velocity should be maintained, unless a change would improve existing conditions, and runoff should be directed away from the Canyon. If runoff into the Canyon is necessary, measures should be implemented to control runoff into Tecolote Creek in accordance with an approved runoff control plan. Landscaping along the Canyon rim should blend with natural vegetation and significant native vegetation should be preserved. Revegetation programs should use "non-reseeding" species to hold soil until vegetation can be established.

City of San Diego MSCP Subarea Plan

The MSCP Subarea Plan (City 1997) is a part of a larger adopted regional conservation plan that allows the participating jurisdictions to maintain development flexibility by proactively planning a regional preserve system. The program focuses on protection and management of habitats rather than on preservation efforts for one sensitive species at a time. The MSCP meets the requirements of the California Natural Communities Conservation Planning (NCCP) Act of 1992. The City MSCP Subarea Plan forms the basis for the Implementing Agreement that is the contract between the City and the wildlife agencies (i.e., USFWS and CDFG). The City cooperated with the wildlife agencies, property owners, developers and environmental groups in developing the City Multi-habitat Planning Area (MHPA). The Preserve Design Criteria contained in the MSCP Subarea Plan were used as guides in the development of the City's MHPA. The MHPA delineates core biological resource areas and corridors targeted for conservation.

The City Subarea Plan encompasses 206,124 acres within the MSCP study area. The City's MHPA is approximately 56,861 acres and includes approximately 47,910 acres within City jurisdiction. Approximately 90 percent of the MHPA lands (52,012 acres) within the City's Subarea will be preserved for biological purposes. The Subarea is divided into five areas (Southern, Eastern, Urban, Northern and Hodges Cornerstone Lands/San Pasqual Valley).

The Urban Area includes existing designated open space within Point Loma, and the more urban areas of the City, which are not incorporated in the major planned areas of the MHPA. The majority of the Urban Area consists of canyons with native habitats in relative proximity to other MHPA areas providing habitat. These areas contribute to the MHPA by providing habitat for native species or shelter and forage for migrating species and by providing environmental education opportunities for urban dwellers of all ages. The majority of the Park is within the MHPA (Figure 3, *MSCP Multi-habitat Planning Area*). Portions of the Park that have been excluded from the MHPA include disturbed areas and portions of Tecolote Canyon Golf Course.

The MSCP Subarea Plan's Overall Management Policies and Directives for the Urban Areas state:

> Where the MHPA's urban habitats are part of a natural resource park, the City Park & Recreation Department has prepared or is preparing a Natural Resource Management Plan for adoption by City Council to govern management of those lands.... If in the future special management needs or issues for specific areas arise, these should be resolved by the MHPA (preserve) managers according to the adaptive

management strategy, and through coordination with the MSCP habitat management technical committee.

The MSCP Subarea Plan provides general planning policies and design guidelines for areas within the MHPA. The MHPA Guidelines applicable to the Park are as follows:

- Existing permitted roads and utility lines are considered a compatible use within the MHPA, and will be maintained; and
- No riprap, concrete or other unnatural material shall be used to stabilize creek banks. Banks shall be natural and stabilized where necessary with willows and other appropriate native plantings. Rock gabions may be used where necessary to dissipate flows and should incorporate design features to ensure wildlife movement.

In addition to existing roads and utility lines, passive recreation and brush management (Zone 2) are considered conditionally compatible with the biological objectives of the MSCP and therefore are allowed within the MHPA.

The MSCP Subarea Plan includes general guidelines for habitat management, but no specific guidelines for the management of the Park. The following general management directives are applicable with regard to public use:

- Provide sufficient signage to clearly identify public access to the MHPA;
- Use appropriate barriers, such as vegetation, rocks/boulders or fencing, to protect highly sensitive areas;
- Locate trails along the edges of urban land uses adjacent to the MHPA, or the seam between land uses, and follow existing dirt roads as much as possible. Avoid locating trails between two different habitat types for longer than necessary;
- In general, avoid paving trails unless management and monitoring evidence shows otherwise. Clearly demarcate and monitor trails for degradation and off-trail access and use. Provide trail repair/maintenance as needed. Undertake measures to counter the effects of trail erosion including the use of stone or wood crossjoints, edge plantings of native grasses, and mulching of the trail;
- Minimize trail widths to reduce impacts to critical resources;
- Off-road or cross-country vehicle activity is an incompatible use in the MHPA, except for law enforcement, preserve management or emergency purposes. Restore disturbed areas to native habitat where possible or critical, or allow to regenerate;
- Limit recreational uses to passive uses such as birdwatching, photography and trail use. Where permitted restrain pets on leashes;
- Remove homeless and itinerant worker camps in habitat areas as soon as found pursuant to existing enforcement procedures;
- Remove litter and trash on a regular basis. Post signage to prevent and report littering in trail and road access areas. Provide and maintain trash cans and bins at trail access points;
- Impose penalties for littering and dumping; and
- Evaluate areas where illegal dumping recurs for the need for barriers. Provide additional monitoring as needed (possibly by local and recreational groups) and/or enforcement.

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MSCP Multi-Habitat Planning Area

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 3

The following additional management directives also are applicable:

- Restoration or revegetation undertaken within the MHPA shall be performed in a manner acceptable to the City;
- Remove giant reed, tamarisk, pampas grass, castor bean, artichoke thistle, and other non-native, invasive species from creek and river systems, canyons and slopes, and elsewhere within the MHPA as funding or other assistance becomes available;
- If funding permits, initiate a baseline survey with regular follow-up monitoring to assess invasion or re-invasion by non-native, invasive species, and to schedule removal. Utilize trained volunteers to monitor and remove non-native, invasive species as part of a neighborhood, community, school, or other organization's activities program;
- If eucalyptus trees die or are removed from the MHPA, replace with appropriate native species. Ensure that eucalyptus trees do not spread into new areas, nor increase substantially in numbers over the years. Eventual replacement by native species is preferred; and
- On a case-by-case basis, some limited trapping of non-native predators may be necessary at strategic locations, and where determined feasible to protect ground and shrub-nesting birds, lizards, and other sensitive species from excessive predation.

The following guidelines apply with regard to the interface between development projects and the MHPA:

- All new and proposed parking lots and developed areas must not drain directly into the MHPA;
- Land uses that use chemicals or generate by-products that are potentially toxic or impactive to wildlife, habitat or water quality need to incorporate measures to reduce impacts caused by the application and/or drainage of such material into the MHPA;
- Lighting of all developed areas should be directed away or shielded from the MHPA;
- Berms or walls should be constructed adjacent to commercial areas, recreational areas and any other use that may introduce noises that could impact or interfere with wildlife utilization of the MHPA;
- New development may require barriers along the MHPA boundaries to direct public access to appropriate locations and reduce domestic animal predation;
- No invasive non-native plant species shall be introduced into areas adjacent to the MHPA;
- New residential development located along the canyon rim must be set back from the slope edges to incorporate appropriate brush management;
- Manufactured slopes associated with site development shall be included within the development footprint for projects;
- Enforce, prevent and remove illegal intrusions into the MHPA on an annual basis, in addition to complaint basis;
- Disseminate educational information to residents adjacent to and inside the MHPA to heighten environmental awareness, and inform residents of access, appropriate plantings, construction or disturbance within MHPA boundaries, pet intrusion, fire management, and other adjacency issues;
- Install barriers and/or signage where necessary to direct public access to appropriate locations; and
- Provide information on invasive plants and animals harmful to the MHPA, and prevention methods, to visitors and adjacent residents. Encourage residents to voluntarily remove non-native, invasive species from their landscaping.

2.3 SDG&E Subregional NCCP

SDG&E has developed a Subregional NCCP to provide a framework for its compliance with the state and federal Endangered Species Acts. The Subregional NCCP is the sole plan that governs SDG&E facility and utility siting, construction, operation and maintenance activities in its service area, including the Park. It contains, among other things, 61 operational protocols designed to avoid, minimize and reduce potential impacts associated with siting, construction, operation and maintenance of SDG&E's natural gas and electric facilities and utility systems (Appendix D). In addition to governing the behavior of SDG&E crews, the NCCP's operational protocols include requirements to keep vehicles and equipment on designated access roads, minimize impacts to sensitive resources and wildlife, and avoid littering.

3.0 EXISTING CONDITIONS

The TCNP NRMP addresses the natural and cultural resources found in the Park, which is located 0.5 mile east of I-5 and 0.9 mile north of I-8. The baseline information provided in the TCNP NRMP does not obviate the need to conduct biological, cultural and other pertinent surveys specific to the site for proposed actions that may potentially result in impacts to Park resources. Site-specific surveys are needed in order to prepare environmental documentation necessary to obtain appropriate permits.

3.1 Geology/Soils

Geologic/Topographic Setting

The Park is located in the coastal subprovince of the Peninsular Ranges Geomorphic Province, a region characterized by northwest-trending structural blocks and fault zones. The coastal subprovince in the San Diego area (also known as the San Diego Embayment) consists of a thick sequence of marine and non-marine sediments deposited during numerous sea level transgression-regression cycles (i.e., advances and retreats) over approximately the last 55 million years. More recent uplift and erosion has resulted in the characteristic canyon and mesa topography present today. Geologic units within the Park include Quaternary (approximately 11,000 years to 2 million years old) alluvium/slope wash deposits, and Quaternary to Tertiary (approximately 2 to 65 million years old) marine and non-marine sedimentary rocks deposited during the noted transgression-regression cycles. Additional description is provided below under Stratigraphy, with general site geology shown on Figure 4, *General Site Geology*.

The Park includes the main branch of Tecolote Canyon and a number of variably sized tributaries. The main branch of Tecolote Canyon is up to approximately 0.5 mile wide, and extends roughly 5.0 miles between the North Clairemont Community Park on the north and the main Park entrance on the south. From its northern end, the main canyon extends predominantly north/south for approximately 3.8 miles, and then turns west and continues approximately 0.9 mile to the main Park entrance. Tecolote Creek continues west from the Park boundary as a channelized (i.e., concrete-lined) drainage for an additional 0.7 mile before reaching Mission Bay. Nearly all of the tributary canyons are located east of the main canyon, with the largest extending approximately 0.9 mile east-northeast from the north end of the golf course, and then branching northwest-southeast for an additional 1.5 miles within the Park (see Figure 4).

Natural slope gradients within the Park include horizontal areas along portions of the Canyon bottoms and nearly vertical grades along a number of Canyon side slopes. Most of the Canyon walls are steep, with slopes of up to 1.5:1 (horizontal to vertical), or 65 percent, common in much of the Park. On-site elevations range from a low of approximately 40 feet AMSL near the main Park entrance, to a high of 320 feet AMSL along a number of mesa tops in the central and northern portions of the Park (see Figure 8). Some of the steep side slopes range up to 200 feet high.

Stratigraphy

Fourteen surficial topsoil deposits and six geologic units have been mapped within the Park, as described below in order of increasing age and shown on Figures 4 and 5.

Topsoils

The majority of the Park is covered with Holocene (less than approximately 11,000 years old) topsoil deposits consisting predominantly of loams or loamy sands. Topsoil mapping within the Park was conducted by the U.S. Soil Conservation Service (SCS; 1973), with 10 soil series encompassing 14 individual soil types identified. Mapped soils within the Park are summarized in Table 1 and shown on Figure 5, *Soils*. All of the soils listed in Table 1 are designated as Hydrologic Group D, except for Reiff soils, which are designated as Hydrologic Group B, and Salinas soils which are designated as Hydrologic Group C (SCS 1973). These designations are used to estimate infiltration rates and runoff potential, with these factors related to erosion hazards. Group D soils exhibit very slow infiltration and high runoff potential, with associated erosion hazards typically high on steeper slopes. Group B soils exhibit moderate infiltration and runoff, with associated erosion hazards variable depending on slope. Group C soils exhibit slow infiltration and moderate to high runoff potential runoff, with erosion hazards typically moderate to high but variable with slope. Additional surficial materials within the Park include fill deposits associated with existing development such as the golf course.

Geologic Units

As described below, geologic units mapped in the Park include Quaternary alluvium/slope wash, Bay Point Formation and Lindavista Formation; and Tertiary Stadium Conglomerate, Friars Formation and Scripps Formation.

Quaternary Alluvium/Slope Wash

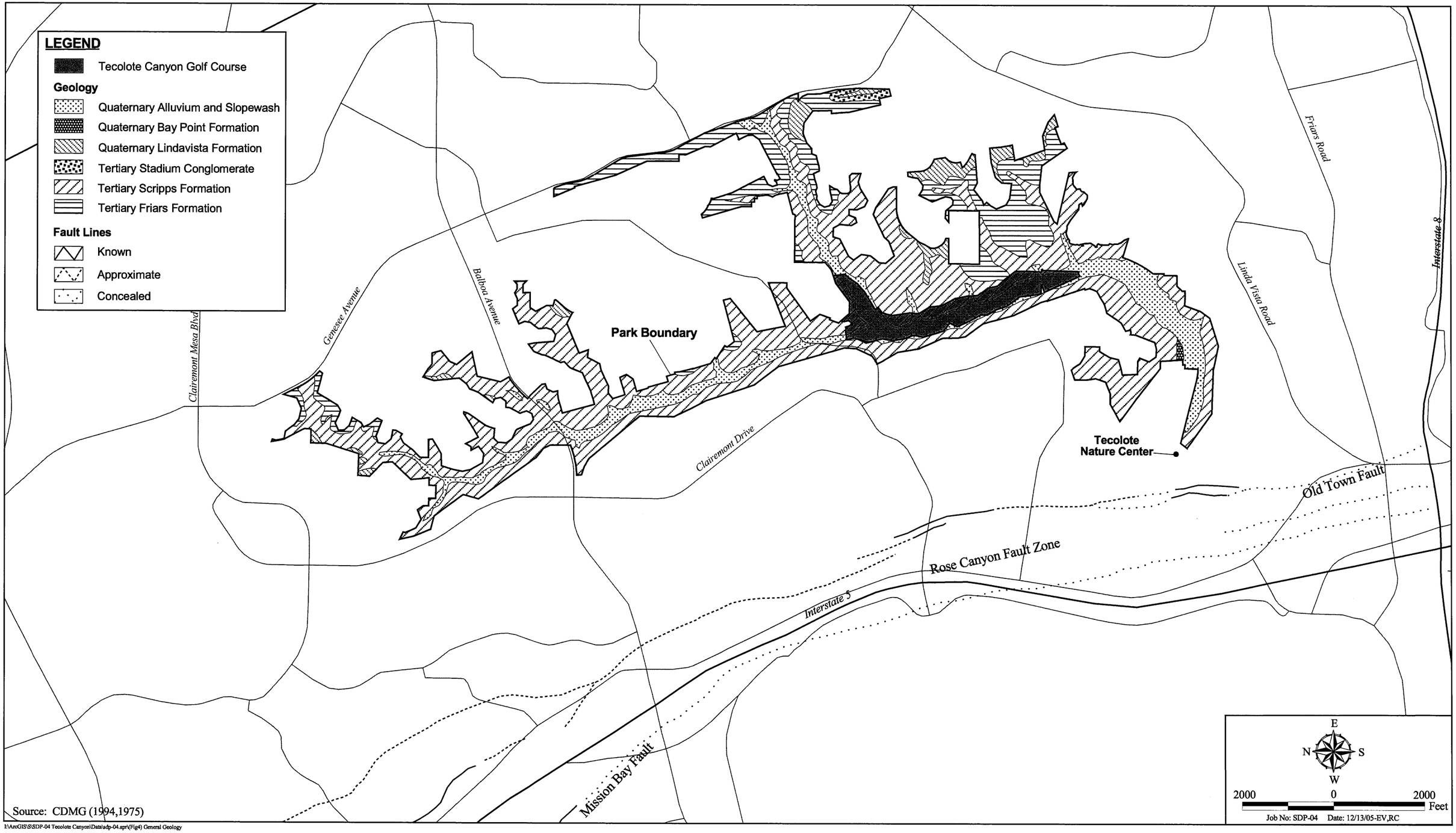
A relatively thin layer (typically 10 feet or less in depth) of Quaternary alluvium is associated with stream deposition in much of the main canyon drainage and several of the associated tributaries (Woodward-Clyde Consultants 1983). Alluvial deposits generally consist of unconsolidated silt, sand and cobble size grains derived from local bedrock sources. Slope wash deposits are located at the base of steep slopes and are deposited chiefly by gravity and/or surface runoff. These deposits are generally similar in composition to alluvium, although they typically exhibit a more angular texture.

Quaternary Bay Point Formation

Exposures of the Bay Point Formation are limited to one small area near the main Park entrance. This formation consists primarily of poorly consolidated, fine-to medium-grained marine and non-marine sandstone.

Quaternary Lindavista Formation

The Lindavista Formation occurs widely on mesa tops in southwestern San Diego County, with exposures in the Park limited to small areas adjacent to the tops of several tributary canyons. It consists of brownish-red, interbedded marine and non-marine sandstone and conglomerate.

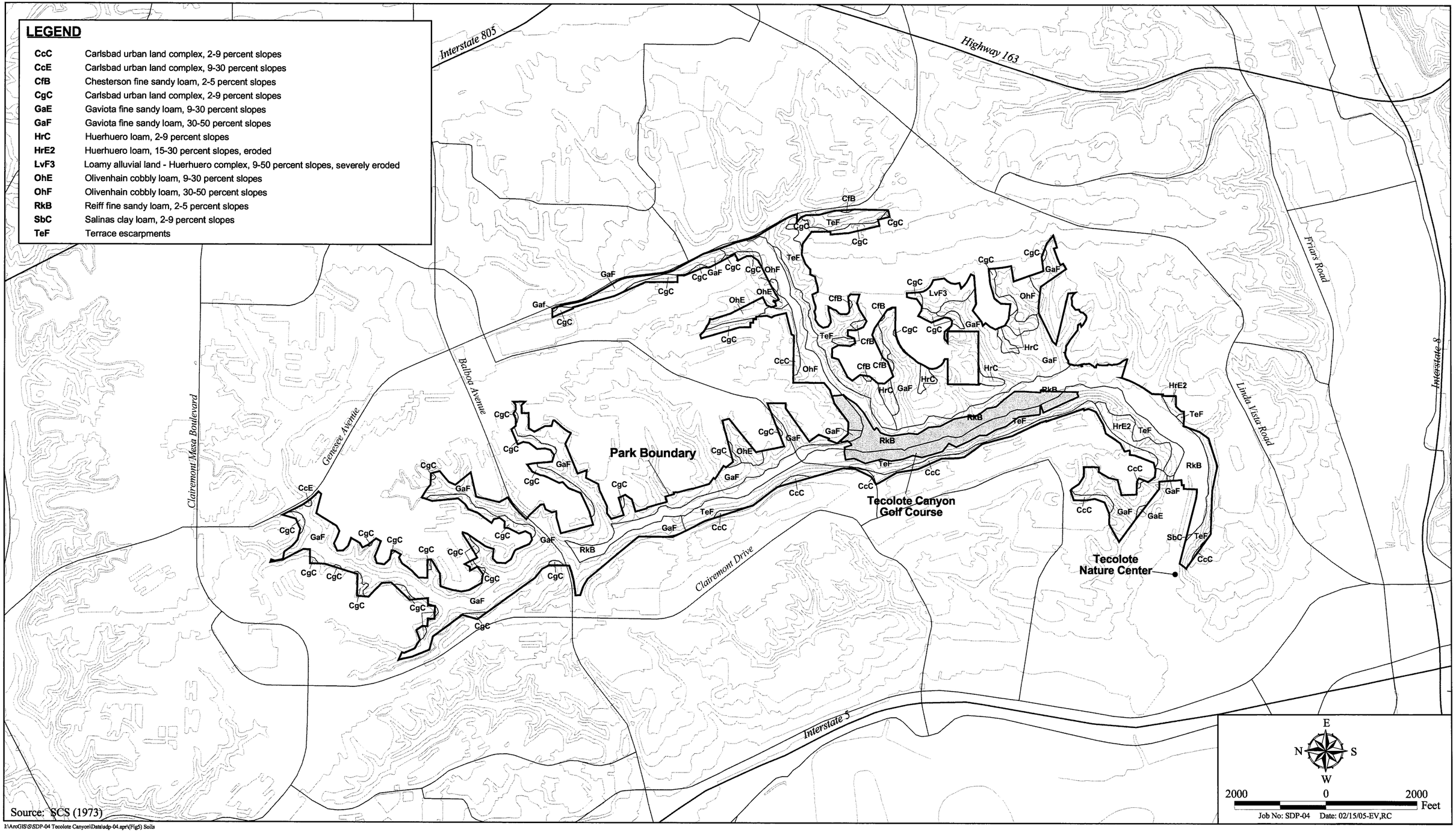


I:\ArcGIS\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig4) General Geology

General Site Geology

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 4



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Soils

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 5

Table 1
DESCRIPTION OF MAPPED SOIL PROPERTIES

Soil (map symbol)[1]	Physical Characteristics	Expansion Potential	pH	Erosion Potential	Limitations for Use as Paths and Trails
Carlsbad urban land complex, 2-9 percent slopes (CcC)	Gravelly loamy sand with a weak hardpan, altered by development and derived from sandstone	Low	--[2]	Low[3]	--[2]
Carlsbad urban land complex, 9-30 percent slopes (CcE)	Gravelly loamy sand with a weak hardpan, altered by development and derived from sandstone	Low	--[2]	Low[3]	--[2]
Chesterson fine sandy loam, 2-5 percent slopes (CfB)	Moderately well-drained fine sandy loam with a sandy clay subsoil, derived from sandstone	Moderate	5.1-6.0	Low	Moderate, due to drainage
Chesterton urban land complex, 2-9 percent slopes (CgC)	Fine sandy loam with a hardpan, altered by development and derived from sandstone	Moderate	--[2]	Low[3]	--[2]
Gaviota fine sandy loam, 9-30 percent slopes (GaE)	Well-drained fine sandy loam derived from marine sandstone	Low	7.4-7.8	Moderate to high	Moderate, due to slope
Gaviota fine sandy loam, 30-50 percent slopes (GaF)	Well-drained fine sandy loam derived from marine sandstone	Low	7.4-7.8	High	High, due to slope
Huerhuero loam, 2-9 percent slopes (HrC)	Moderately well-drained loam with a clay subsoil and hummocks, derived from sandy marine sediments	High	5.1-6.0	Low to moderate	Low
Huerhuero loam, 15-30 percent slopes, eroded (HrE2)	Moderately well-drained loam with a clay subsoil, derived from sandy marine sediments	High	5.1-6.0	Moderate to high	Moderate, due to slope
Loamy alluvial land-Huerhuero complex, 9-50 percent slopes, severely eroded (LvF3)	Poorly-drained silty to sandy loam, formed on ridges adjacent to drainages	Low to high	5.1-6.0[4]	High	High, due to slope
Olivenhain cobbly loam, 9-30 percent slopes (OhE)	Well-drained cobbly loam with a cobbly clay subsoil and hummocks, derived from alluvium	Moderate	5.6-6.0	Moderate to high	Moderate, due to slope and rock content
Olivenhain cobbly loam, 30-50 percent slopes (OhF)	Well-drained cobbly loam with a cobbly clay subsoil, derived from alluvium	Moderate	5.6-6.0	High	High, due to rock content
Reiff fine sandy loam, 2-5 percent slopes (RkB)	Well-drained fine sandy loam derived from granitic alluvium	Low	6.1-8.4	Low	Low
Salinas clay loam, 2-9 percent slopes (SbC)	Well-drained clay loam derived from loamy sediments	Moderate	6.6-8.4	Low to moderate	Low
Terrace escarpments (TeF)	Thin loamy or gravelly soil located on steep canyon slopes and underlain by sandstone, shale or gravelly sediments	Variable	N/A[5]	High	High, due to slope

[1] Refer to Figure 5.
[2] Variable depending on the material present (e.g., construction fill or native soils).
[3] Low in level developed areas such as building pads; may be moderate or high on manufactured slopes.
[4] Listed pH is for Huerhuero portion, other portions vary with content.
[5] No data available, but likely acidic based on underlying geologic units
Source: SCS (1973)

Tertiary Stadium Conglomerate

Exposures of the Stadium Conglomerate within the Park are limited to two small areas along the southern extent of the largest tributary canyon. This unit consists of cobble conglomerate lacking distinct structural features, within a coarse-grained sandstone matrix.

Tertiary Friars Formation

The Friars Formation occurs along the upper slopes of several tributary canyons in the eastern portions of the Park. This unit consists of interbedded nonmarine and lagoonal sandstone and claystone layers. The claystone layers comprise weakness planes and are often susceptible to landsliding hazards.

Tertiary Scripps Formation

The Scripps Formation is the predominant geologic unit underlying the watershed and is widely exposed within the Park, occurring on most Canyon slopes. It consists primarily of yellowish-brown medium-grained sandstone, with occasional cobble-conglomerate interbeds.

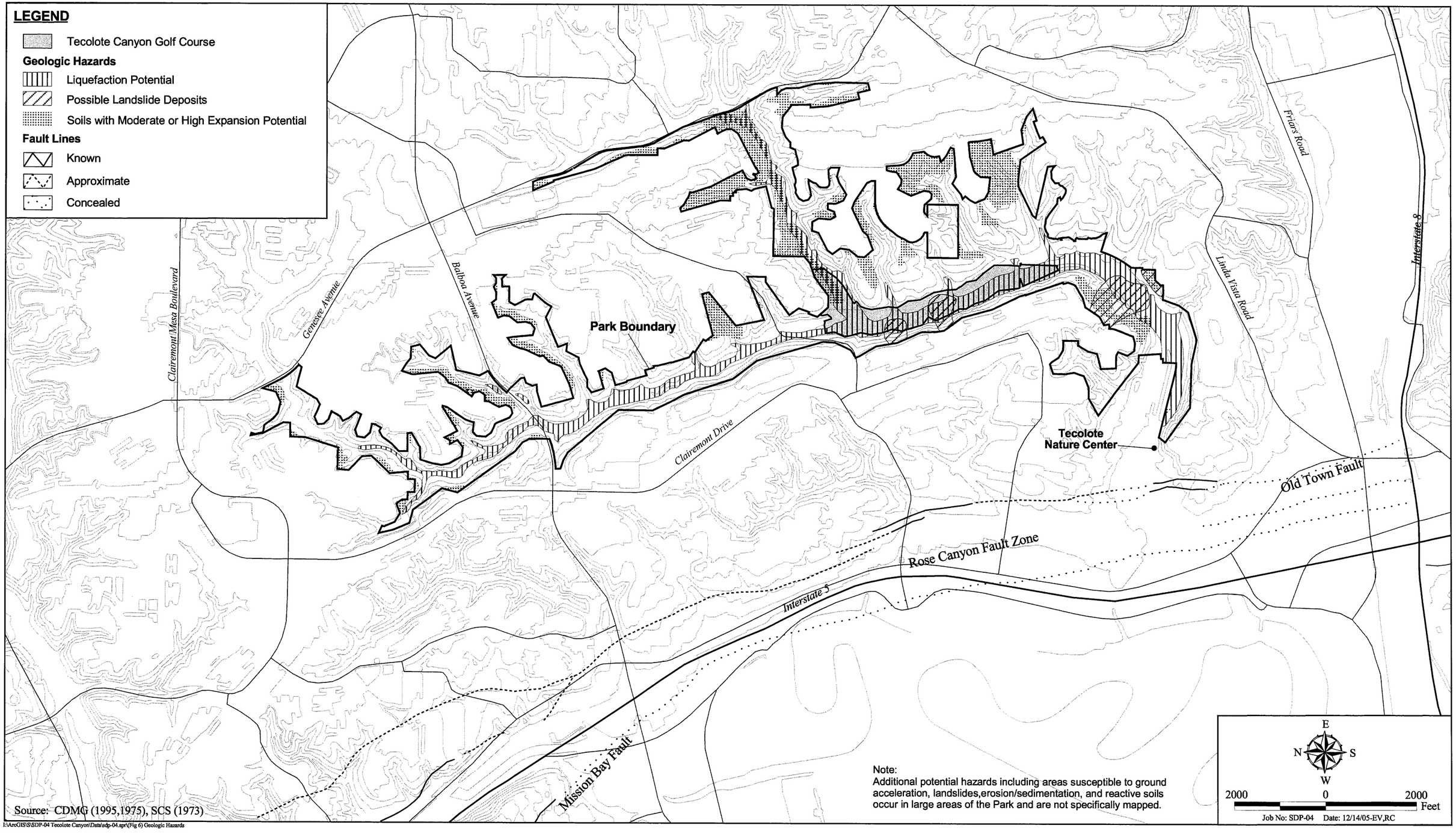
Structure/Seismicity

The Park is within a broad seismically active region characterized by a series of northwest-trending faults associated with the San Andreas Fault System. The closest active faults to the Park are associated with the Rose Canyon Fault Zone, which is located approximately 1,000 feet to the west at its closest point (Figure 4). Active faults are defined as those exhibiting historic seismicity or displacement of Holocene materials. The maximum earthquake considered capable of occurring under the presently known tectonic framework for the Rose Canyon Fault Zone is generally given as Richter magnitude 7.0 (California Division of Mines and Geology [CDMG] 1992). The maximum estimated ground acceleration (ground shaking) levels within the Park from a magnitude 7.0 earthquake along nearby segments of the Rose Canyon Fault Zone would likely exceed 0.6g, where g equals the acceleration due to gravity (CDMG 1992).

No Fault-Rupture Hazard Zones have been designated within or adjacent to the Park boundaries by the California Geological Survey (CGS, formerly the CDMG), with this designation intended to "[r]egulate development near active faults so as to mitigate the hazard of surface fault rupture" (CDMG 1999). The closest such designations are associated with nearby segments of the Rose Canyon Fault Zone.

Geologic Hazards

Based on the information provided above, geologic hazards that could affect existing and planned uses within the Park include seismic ground acceleration and liquefaction, seismic and non-seismic landsliding, erosion/sedimentation, and expansive or reactive soils. The locations of those hazards that are limited to certain portions of the Park are shown on Figure 6, *Geologic Hazards*. While ground acceleration levels within the Park could potentially exceed 0.6g, such an occurrence and potentially associated liquefaction (the phenomenon whereby soils lose shear strength and exhibit fluid-like flow behavior) would typically not substantially affect natural resources or passive Park facilities such as hiking trails and associated users. Similarly, the effects of expansive and reactive soils also are expected to be limited to structures and utilities, with no impacts anticipated to natural resources or passive



I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig 6) Geologic Hazards

Geologic Hazards

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 6

Park facilities. It is assumed that existing structures and utilities within the Park have incorporated appropriate design features pursuant to applicable industry standards and regulatory requirements; therefore, no further discussion is provided.

The geologic hazards that do have potential to affect the Park's natural resources and/or passive recreational facilities are described below.

Landsliding

The occurrence of landslides and other types of slope failures (e.g., mudslides) are influenced by a number of factors, including slope grade, geologic and soil characteristics, moisture levels and vegetation cover. Landsliding can be triggered by one or more specific (or combination of) events, including seismic activity, gravity, fires and precipitation. The Park encompasses numerous steep Canyon slopes in combination with unstable geologic structures, resulting in a high potential for landslides throughout much of the Park. Several possible landslide deposits have been mapped within the Park boundaries by the CDMG (1995), and at least one home adjacent to the Canyon has lost its backyard in recent years due to unstable underlying materials.

As shown on Figure 6, potential landslide deposits identified by CDMG are located in the central and southern portions of the Park, and are associated with exposures of the Scripps Formation and likely the underlying Friars Formation (refer to Figure 4). The mapped landslide deposits were identified in a broader analysis of landsliding hazards conducted by the CDMG (1995). This study designated virtually all of the west-facing slopes along the main branch of Tecolote Canyon, as well as most slopes associated with the eastern tributary canyons, as "most susceptible" to landsliding hazards (Area 4). This designation is characterized by "...unstable slopes...and slopes where there is evidence of downslope creep of surface materials." These areas of the Park are further described as Subarea 4-1, or "Generally outside of the boundaries of definite mapped landslides but containing observably unstable slopes underlain by both weak materials (particularly geologic units...with abundant clay material...such as...the Friars Formation)...and adverse geologic structure." Most of the east-facing slopes on the west side of Tecolote Canyon are designated as "generally susceptible" to landsliding (Area 3), with slopes in the Park described as "...at or near their stability limit due to a combination of weak materials and steep slopes." Because the noted landslide hazard designations encompass virtually all slopes within the Park, they are not depicted on Figure 6.

Based on the above discussion and observed conditions on the ground (i.e., extensive steep grades with some areas disturbed by previous development activities), much of the Park is susceptible to landslide hazards. Such activity could substantially affect existing and planned facilities, including trails.

Erosion/Sedimentation

As noted in the above text and Table 1, the Park includes a number of geologic units and topsoils with moderate to high erosion potentials. Areas susceptible to erosion are associated primarily with steeper slopes and development or use areas within or adjacent to drainages (e.g., road, trail and utility stream crossings). Because areas with moderate or high erosion/sedimentation potential encompass most areas within the Park, they are not depicted on Figure 6.

A study of erosion and sedimentation conducted by Woodward-Clyde Consultants in 1983 identified three types of rainfall erosion occurring within the Park: streambank erosion, gullying, and overland sheet and rill erosion. Much of Tecolote Creek is incised. In particular, streambed erosion has down-

cut through the alluvium into the very dense Scripps Formation in the main creek south of Mount Acadia Avenue and in the main east-west tributary. Because the Scripps Formation is highly erosion-resistant relative to the alluvium of the streambanks, the creek has subsequently widened and caused erosion of the streambanks, a process that is anticipated to continue. Analysis of the extent of erosion determined that approximately 60,000 cubic yards of material had been eroded through the widening of the Tecolote Creek channel, with approximately 30 percent of the noted erosion occurring between 1978 and 1981. Approximately 40 percent of the sediment volume from the watershed was determined to result from streambank erosion.

Concentrated water flow onto the upper side slopes of the Canyon has resulted in deep, narrow gullies from the edge of the Canyon to the Creek in a number of locations. Gully erosion has primarily resulted from storm drain outlets that were constructed without energy dissipaters or other protection against erosion or scour. The analysis determined that gully erosion had resulted in a total sediment volume of approximately 4,000 cubic yards, representing approximately 4 percent of the total yield from the watershed.

Finally, overland, or sheet and rill, erosion was noted by Woodward-Clyde Consultants as occurring throughout the study area, particularly in places where the natural vegetation had been disturbed or removed. Overland erosion was estimated to result in 53 percent of the sediment produced in the watershed, or approximately three tons per acre per year.

Erosion within the Park has resulted in substantial sedimentation into Mission Bay. In 1980, the City dredged approximately 125,000 cubic yards of material from Mission Bay near the mouth of Tecolote Creek. This amount represented 17 years of sediment yield from the Tecolote watershed (Woodward-Clyde 1983).

Measures have previously been taken to minimize areas of erosion, including installation of filter fabric, rip-rap and rock gabions at select locations. These measures have reduced the extent of erosion within the Park and, correspondingly, the flow of sediment into Mission Bay from the Park. Field observations in 2004 did not identify existing large-scale erosion/sediment transport problems within the Park, as most areas of high erosion potential contain dense vegetation and exhibit generally stable conditions. Several areas of existing erosion were noted, however, with most related to: (1) previous disturbance on slopes; (2) areas where monoculture non-native vegetation (e.g., ice plant) has died off and created unvegetated zones; (3) point runoff in existing roads or trails creating rills; and (4) scour at unpaved road/trail stream crossings. One of the major areas of concern occurs in the southern portion of the Park, where runoff from a storm drain outlet associated with USD has resulted in substantial erosion of the Park's main access road and the adjacent slopes of Tecolote Creek.

The potential exists for erosion hazards to be exacerbated by both existing conditions (e.g., large areas of monoculture non-native vegetation) and planned facilities/activities (e.g., habitat restoration, trail construction/maintenance and utility upgrade/maintenance). For example, in addition to activities/facilities identified as part of the TCNP NRMP, the City Metropolitan Wastewater Department has identified the need to modify a number of access roads/trails within the Park (refer to Section 6.1). Such modifications would at least temporarily increase the potential for erosion and transport of material both within and downstream of work areas through activities such as: (1) removal of stabilizing vegetation cover; (2) creation of manufactured slopes; (3) excavation of existing compacted surface materials; and (4) redeposition of excavated materials as fill deposits. The movement of eroded materials into adjacent drainages could adversely affect local water quality and biological resources through (for example) increased turbidity.

Paleontological Resources

As noted above, geologic exposures within the Park include a number of Quaternary and Tertiary-age age deposits. A summary description of paleontological resources and sensitivities associated with these units is provided below in Table 2.

A registered fossil mammal site (Los Angeles County Museum CIT 314, University of California Mammal Project V6882, University of California-Riverside RV7046) is found approximately 1,000 feet southwest of the southwest corner of the Mesa College property line, at or near the junction of the Scripps Formation and Friars Formation. Additionally, a paleontological dig was completed in the southern portion of the Canyon by the San Diego Museum of Natural History in 1980, yielding excellent specimens of Pliocene marine mammal skeletal remains (Tecolote Canyon CAC 1982). The remains recovered included whale bones, a porpoise skull and shark teeth (Battle, pers. comm.).

Table 2
SUMMARY OF PALEONTOLOGICAL RESOURCES AND SENSITIVITIES
IN TECOLOTE CANYON NATURAL PARK

Geologic Unit[1]	Description of Paleontological Resources That Have Been Found	Sensitivity Rating[2]
Quaternary Alluvium/Slope Wash	Fossils generally unknown, with localized exceptions including isolated mammoth teeth, limbs and tusks	Low
Quaternary Bay Point Formation	Large and diverse assemblages of well-preserved marine invertebrates, as well as minor vertebrates	High
Quaternary Lindavista Formation	Fossils generally uncommon, but has produced important invertebrate and vertebrate remains	Moderate[3]
Tertiary Stadium Conglomerate	Abundant and diverse assemblages of important fossils including terrestrial and marine mammals	High
Tertiary Friars Formation	Abundant fossils including terrestrial mammals and marine invertebrates and microfossils	High
Tertiary Scripps Formation	Important marine vertebrate and invertebrate remains, as well as terrestrial plant fossils	High

[1] Refer to Figure 4 for locations within the Park
[2] From the City of San Diego CEQA Significance Determination Guidelines
[3] Moderate rating applies to the Park (and other areas); in some other locations this formation is assigned a high rating
Source: Demeré and Walsh (1994)

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3.2 Hydrology and Water Quality

Watershed and Drainage Characteristics

The Park is within the Tecolote Hydrologic Area (HA) of the Peñasquitos Hydrologic Unit (HU). The Peñasquitos HU is 1 of 11 such drainage areas designated in the 1994 (as amended) Basin Plan. The Peñasquitos HU is a triangular area of approximately 170 square miles and extends from Poway on the east to Mission Bay-Del Mar along the coast. The Tecolote HA is a subdivision of the Peñasquitos HU based on local drainage characteristics, and extends inland from the southwestern boundary of the HU (and the southwestern portion of Mission Bay) to encompass the 9.5-square mile Tecolote Creek watershed (Figure 7, *Park Location Within the Tecolote Hydrologic Area*). Surface drainage in the Tecolote HA occurs through Tecolote Creek and a number of small to moderate size tributaries. Annual precipitation in the Peñasquitos HU ranges from approximately 8 inches along the coast to 18 inches at some inland locations, with the Park and vicinity receiving approximately 10.5 inches per year (MEC Analytical Systems, Inc. [MEC] 2003).

The entire Park (and all of the Tecolote HA) drains to Tecolote Creek and associated tributaries, with flow directions varying locally with topography. Flows within Tecolote Creek move generally south and west through the Park, and eventually enter Mission Bay approximately 0.7 mile west of the main Park entrance. Flows within the Park (and all of the Tecolote HA watershed) are derived from seasonal storms, as well as landscape irrigation runoff from adjacent and upstream urban development (as described below). Due to the extensive nature of this development (including substantial areas within and adjacent to the Park), most of the Tecolote Creek Channel is highly incised and flows within it are typically perennial or nearly perennial.

Drainage Facilities and Flood Hazards

Substantial urban development occurs in areas adjacent to and surrounding the Park, with approximately 77 associated storm drains emptying into the Park (refer to Figure 13). The Park itself is mostly undeveloped, although notable existing facilities include the Tecolote Nature Center, Tecolote Canyon Golf Course, SDG&E power lines, paved (Balboa Avenue, Mount Acadia Boulevard, Snead Avenue and Boyd Avenue) and unpaved roads and trails, a natural gas pump station, and numerous underground utility lines (refer to Section 3.5). Existing drainage facilities associated with the described development include bridges or culverts at the paved road crossings; at-grade or culvert stream crossings along unpaved roads and trails; several flow control structures (i.e., rock gabions and brow ditches); and approximately 200 linear feet of channelized drainage along Tecolote Creek near the main Park entrance. As noted above in Section 3.1, a number of existing stream crossings exhibit generally minor erosion and scour issues, with these crossings typically stabilized with a combination of riprap armoring and filter fabric. The rock gabion flow control structure immediately south of the golf course's clubhouse has deteriorated, with a corresponding reduction in flow control ability likely.

A crest-stage gauge operated in Tecolote Creek from 1964 until 1977. The maximum measured flow during this time period was 2,700 cubic feet per second (cfs) on January 7, 1974 (Woodward-Clyde Consultants 1983). Peak runoff from a 10-year/24-hour storm in the Tecolote HA has been calculated at 1,433 cfs. Modeled peak flows at the mouth of Tecolote Creek during a 25-, 50- and 100-year storm event are 3,003, 3,580 and 3,653 cfs, respectively. Typical flow velocities for the 100-year storm are anticipated to be on the order of 10 to 14 feet per second in areas where the creek is confined to a narrow, deep channel (Woodward-Clyde Consultants 1986). The runoff volume associated with an event as small as the 10-year storm is expected to exceed the capacity of the

relatively narrow Tecolote Creek floodway and spread throughout the associated floodplain (City 2003c). The project site and vicinity have been mapped for flood hazards by the Federal Emergency Management Agency (FEMA). Much of the Park area along Tecolote Creek and the largest tributary canyon are within mapped 100-year floodplains, as shown on Figure 8, *Floodplain Boundaries* (FEMA 1997a through 1997e). The 100-year floodplain ranges from approximately 100 feet in width at several locations along the main floodway to approximately 600 feet wide in the main tributary canyon.

Groundwater

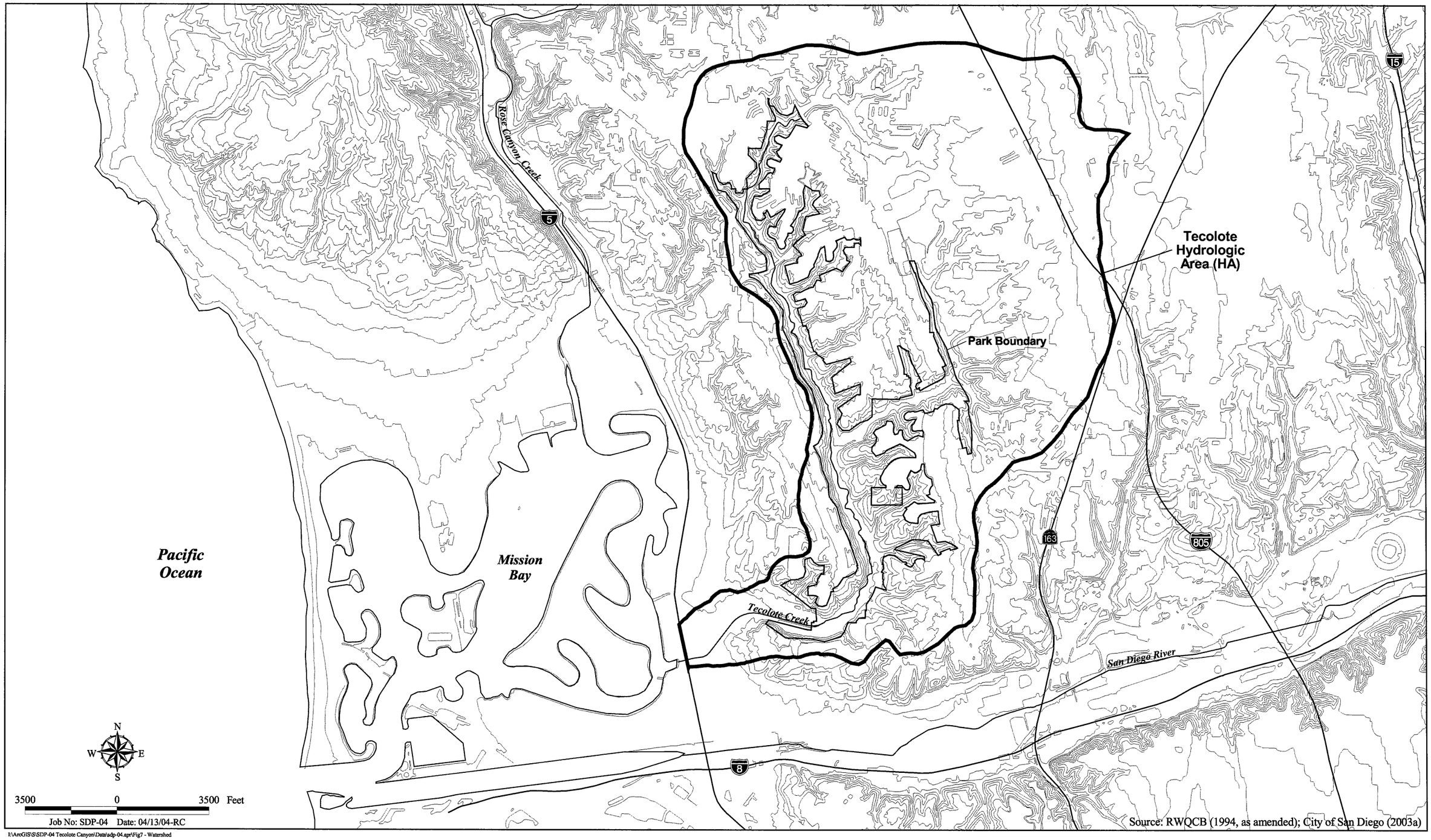
No major groundwater basins are mapped within or adjacent to the Tecolote HA (California Department of Water Resources [DWR] 1975, San Diego County Water Authority [SDCWA] 1997). Shallow groundwater is almost certainly present within the HA and the Park, however, in association with Tecolote Creek and the larger tributary drainages. Local groundwater may include both permanent and seasonally "perched" aquifers (i.e., one or more small unconfined aquifers supported by shallow impermeable or semi-permeable strata). Perched aquifers are typically variable in volume and extent with seasonal precipitation and/or irrigation levels.

Water Quality

The assessment of water quality in the Tecolote HA and the Park is based primarily on conformance with applicable regulatory requirements, including the federal Clean Water Act (CWA), NPDES, State Porter-Cologne Water Quality Control Act, and water quality objectives and related beneficial use criteria identified in the SWRCB California Ocean Plan (SWRCB 2001) and the RWQCB Basin Plan. Because groundwater criteria for the Tecolote HA are not included in any of the noted regulatory sources, the following discussion is limited to surface waters.

The SWRCB and RWQCB produce bi-annual qualitative assessments of statewide and regional water quality conditions. Since 1998, these assessments have focused on CWA Section 303(d) impaired water listings and priority status for assignment of total maximum daily load (TMDL) requirements. The Section 303(d) and TMDL assessments involve prioritizing waters on the basis of water quality (i.e., impaired) status and the necessity for assigning quantitative contaminant load restrictions (i.e., TMDL), with these data submitted to the EPA for review and approval. The most current (2002) assessment identifies both Mission Bay and Tecolote Creek as impaired waters (SWRCB 2003). The listing for Tecolote Creek is based on elevated levels of contaminants including bacterial indicators, cadmium, copper, lead, toxicity and zinc, with a medium TMDL priority identified. Mission Bay is listed on the basis of eutrophic conditions, coliform counts and lead, with TMDL priority ranging from low (coliform) to medium (eutrophic conditions and lead).

The RWQCB Basin Plan identifies beneficial uses and water quality objectives for inland and coastal waters, and defines beneficial uses as "the uses of water necessary for the survival or well being of man, plus plants and wildlife." Existing and potential beneficial uses identified for Tecolote Creek include contact and non-contact water recreation, warm freshwater habitat and wildlife habitat. Identified beneficial uses for downstream waters in Mission Bay include each of these uses, with the exception of warm freshwater habitat. They also include industrial service supply; commercial and sport fishing; estuarine habitat; rare, threatened or endangered species habitat; marine habitat; migration of aquatic organisms; and shellfish harvesting.

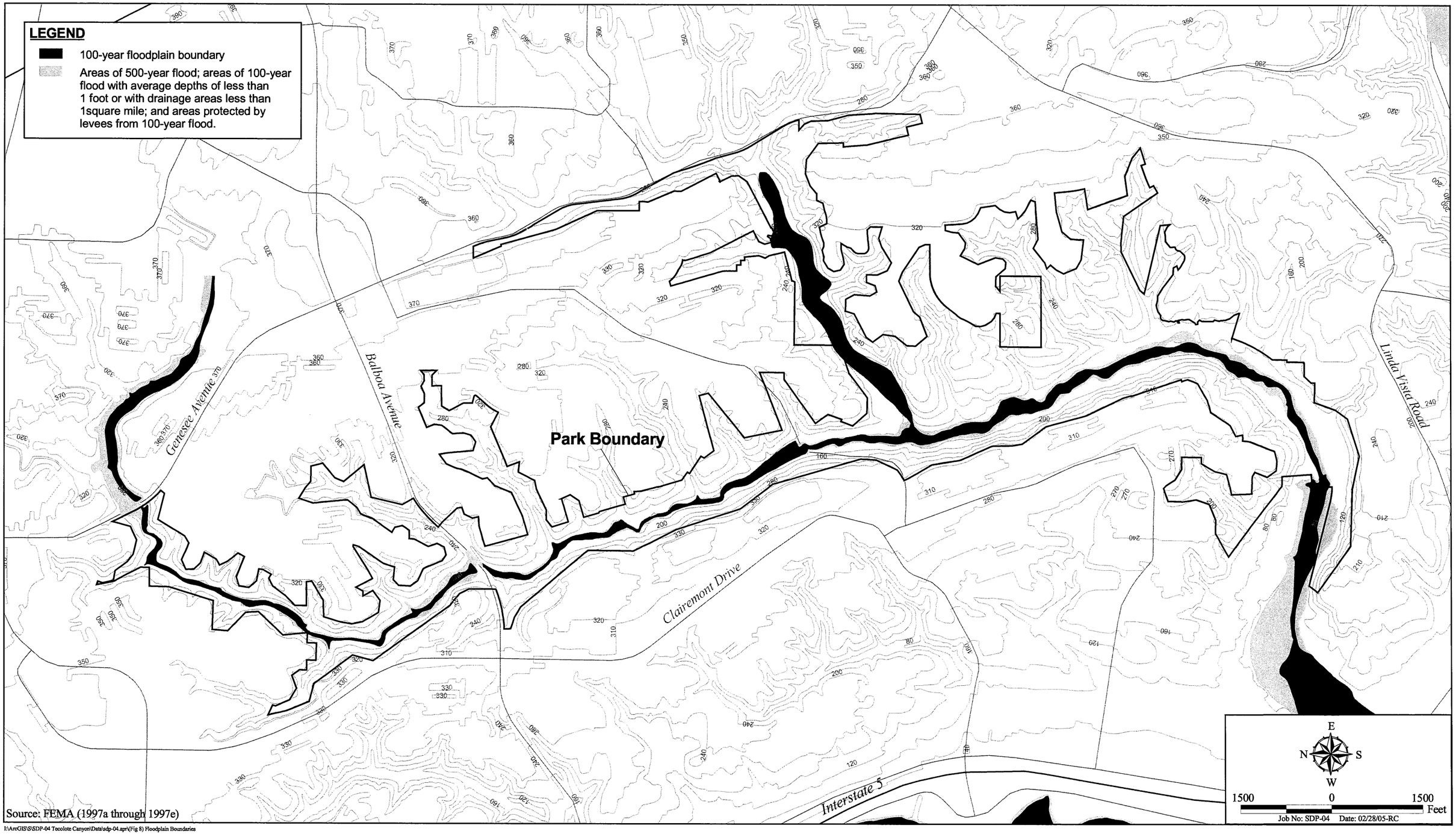


I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\Fig7 - Watershed

Park Location Within the Tecolote Hydrologic Area

TECOLOTE CANYON NRMP

Figure 7



Source: FEMA (1997a through 1997e)

I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig 8) Floodplain Boundaries

Floodplain Boundaries

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 8

Water quality objectives are identified in both the Basin Plan and the California Ocean Plan to protect water quality and support beneficial uses. These objectives encompass both numeric and narrative requirements for a range of physical, chemical, bacterial and biological contaminants. Water quality objectives are used along with data collected in the monitoring efforts described below to assess water quality conditions, regulatory conformance and recommendations for further studies and remediation efforts.

As previously described, surface water within the Park consists primarily of runoff associated with seasonal storm events and landscape irrigation. Due to the heavily urbanized nature of the watershed, observed water quality in the Tecolote HA and the Park is generally poor, with such conditions documented over approximately the past 30 years. Specifically, a monitoring study conducted by the U.S. Geological Survey (USGS) in the mid-1970s concluded that established water quality objectives in Tecolote Creek were exceeded for a number of constituents, including chemical oxygen demand, lead, nitrogen, orthophosphorous, fecal coliform bacteria, several chemical pesticides (including diazinon), iron, chromium, mercury and zinc (USGS 1980).

More recent water quality monitoring has been conducted for the Tecolote Creek watershed and Mission Bay in association with requirements under NPDES municipal storm water permit CAS0108758, including efforts pursuant to RWQCB Order No. 90-42 (1993 to 2000 monitoring), and RWQCB Order No. 2001-01 (monitoring beginning with the 2001/2002 storm season). Data collection for the described monitoring was conducted at a number mass loading stations (MLSs), including the Tecolote Creek MLS located approximately 400 feet southwest (downstream) of the main Park entrance. Monitoring efforts involved numerous constituents of concern, including nitrogen compounds, phosphorous, oil and grease, bacterial indicators, pH, turbidity, chemical oxygen demand, biochemical oxygen demand, total suspended solids, metals, chemical pesticides (including diazinon) and toxicity to aquatic test organisms. Monitoring at the Tecolote MLS site between 1993 and 2000 observed that water quality objectives were regularly exceeded for constituents of concern including fecal and total coliform counts, total kjeldahl nitrogen, total suspended solids, copper and zinc (MEC 2001).

Monitoring at the Tecolote Creek MLS site was conducted for three storm events during the 2001-2002 winter season. Fecal coliform counts exceeded Basin Plan beneficial use criteria for all three storm events, organophosphate pesticide (diazinon) levels exceeded CDFG criteria for all three storm events, turbidity levels exceeded Basin Plan objectives for one storm event, and samples from two storm events were toxic to aquatic test organisms (MEC 2003).

In addition to the above-described monitoring, biological assessment (bioassessment) studies have been conducted at a single site along Tecolote Creek within the Park (downstream of Mount Acadia Boulevard) between 1998 and 2002 (RWQCB 2002, 2001, 1999). They involved evaluation of (among other criteria) the taxonomic richness (i.e., number of taxonomic groups) and diversity (i.e., species diversity within taxonomic groups) of benthic macroinvertebrate (BMI) communities. All tested sites were numerically ranked for the condition of BMI communities, with the Tecolote Creek location consistently below the mean ranking for all sites tested (and often among the lowest rankings). The 2001/2002 NPDES Permit monitoring report (MEC 2003) concluded that the benthic community in Tecolote Creek is "[m]oderately to substantially impacted." Because BMI communities are sensitive to water quality (including criteria such as dissolved oxygen, sedimentation, nutrients and chemical/organic pollutants), the generally low rankings for the Tecolote Creek site likely reflect (at least in part) poor local water quality conditions.

Tecolote Creek is one of several sources that empties into Mission Bay. The City of San Diego Storm Water Program monitors local beach conditions relative to water quality, based on sampling conducted by the City and/or County of San Diego. Pursuant to these observations, postings (i.e., advisories or closures based on an individual beach exceeding regulatory standards for the day) for Mission Bay beaches totaled 1,480 in 2000, 838 in 2001 and 496 in 2002 (City 2004c). Most of these postings were associated with high bacterial counts related to sewage spills, although other bacterial sources and contaminants (e.g., oil and grease) were also cited.

Based on the above-described regulatory assessments and monitoring information, historic and current water quality conditions in Tecolote Creek and the Park are characterized as generally poor. This conclusion was supported by field reconnaissance of the Park in March 2004, with observed conditions in Tecolote Creek including widespread visible contaminants such as trash and debris, floatables, organic material and an oily surface sheen. The poor water quality occurring within the Park represents a significant issue over which the Park has relatively little control, because the contaminants enter the Park from the entire surrounding urbanized watershed.

3.3 Biological Resources

Tecolote Canyon is one of the few remaining relatively natural coastal canyons. This situation allows a high level of diversity for plant and animal species, which contribute to the unique richness of the Park in urban San Diego. Generally, the lower elevations of the canyon are characterized by mature riparian vegetation, while the slopes are vegetated by chaparral and coastal sage scrub.

Tecolote Canyon has not been the subject of comprehensive biological surveys. Efforts that have occurred include surveys associated with emergency sewer repair and maintenance projects in various portions of the canyon as well as (generally poorly documented) efforts by individual biologists or amateur naturalists with an interest in the Park. Information was assembled from existing sources, including the City MSCP Subarea Plan (City 1997); California Natural Diversity Database (CNDDB; 2004 and 2005); Master Plan (Tecolote Canyon CAC 1982); Biological Resources Report for the Proposed Sewer Canyon Access Project – Tecolote Canyon (Earth Tech, Inc. 2003); Biological Resources Report and Impact Assessment for the Manning Canyon Emergency Sewer Maintenance and Repair Project (Dudek & Associates, Inc. [Dudek] 2003a); Biological Resources Report and Impact Assessment for the Mt. Elbrus and Tecolote Canyon Emergency Sewer Repair Project (Dudek 2003b); Biological Resources Report and Impact Assessment for the East Clairemont Segment Tecolote Canyon Emergency Sewer Repairs (Tierra Environmental Services [Tierra] 2004); and personal communication with those knowledgeable about the Park (Tecolote Canyon CAC Chair M. Eloise Battle and Senior Park Ranger Carla Frogner).

Efforts conducted by HELIX Environmental Planning, Inc. (HELIX) in spring 2004 included vegetation mapping (including mapping of exotic species), rare plant surveys and bird counts. Rare plant surveys were conducted in May. Observations of sensitive animal species during vegetation mapping and rare plant surveys also were recorded.

Nine bird count stations were established throughout the Park based on ease of access (from nearby streets) and vegetation communities present (an effort was made to sample as many different communities as possible). Stations were at the closest approximately 1,400 feet apart but an unlimited radius for counting encircled each station. Weather conditions and the ambient noise (subjectively rated on a scale of 1 to 4 with 1 being low) at each station were recorded. The bird count surveys were conducted between approximately 0615 and 1300 hours on May 7 and June 8, 2004. Ten minutes were spent at each station, and birds that were directly observed were counted while those that were heard only were also recorded. Any other species (e.g., coyote [*Canis latrans*]) that was observed was also recorded along with sensitive non-avian species (e.g., orange-throated whiptail [*Aspidoscelis hyperythra beldingi*]), management concern species (e.g., brown-headed cowbird [*Molothrus ater*]) and habitat disturbances. All species that were observed while walking between count stations (and not already observed at the previous station) were noted as well.

Natural Communities

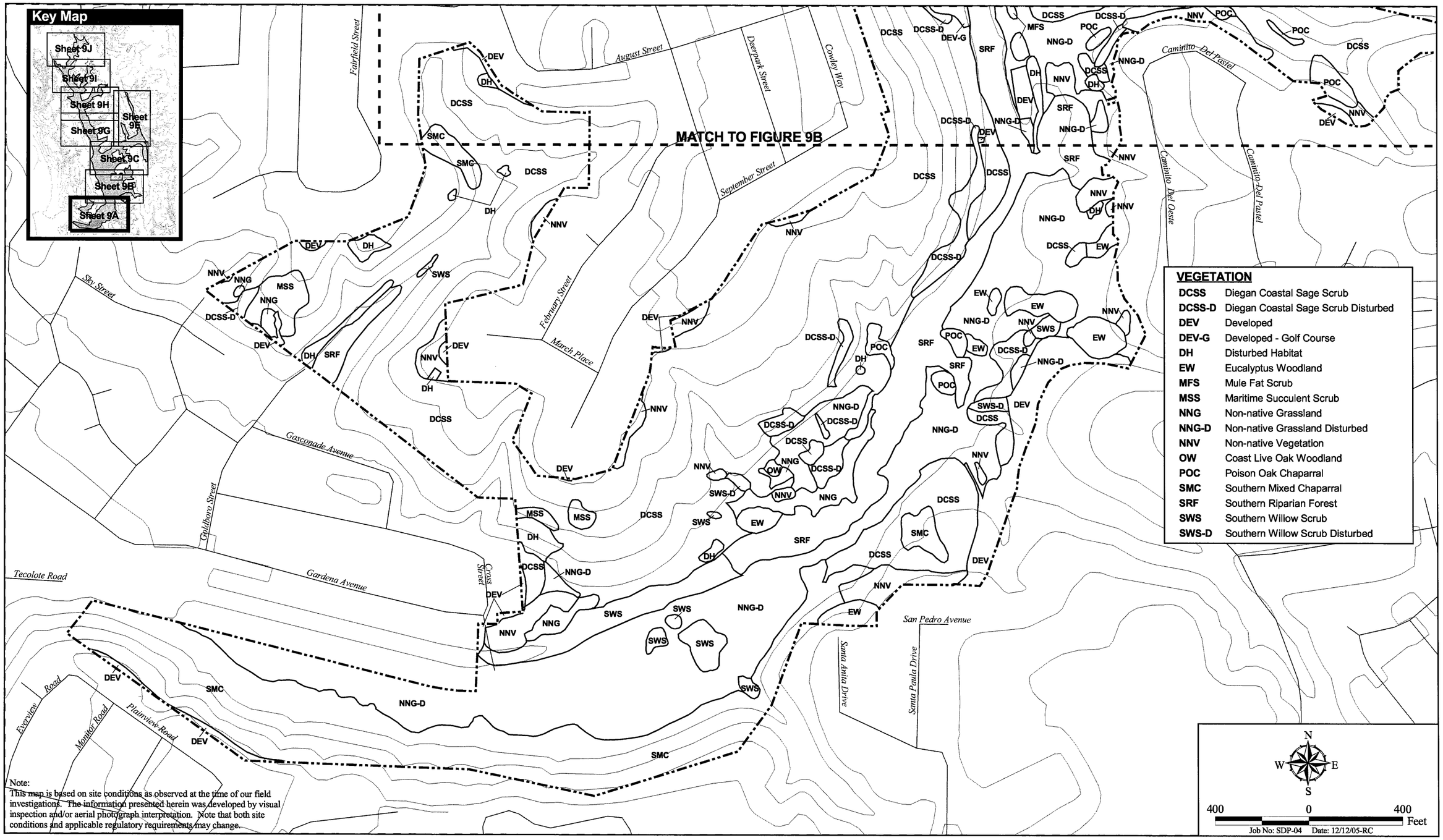
Seventeen native and non-native vegetation communities (along with disturbed counterparts) were identified in the Park. Additionally, disturbed and developed land, including the Tecolote Canyon Golf Course, occur within the Park's boundaries. Descriptions of all of these communities are provided below in order of sensitivity, are shown on Figures 9A through 9J, *Vegetation Map*, and are summarized in Table 3.

Table 3
EXISTING VEGETATION COMMUNITIES

VEGETATION COMMUNITY	ACREAGE
Wetlands	
Vernal pool	0.1
Southern riparian forest (including disturbed)	90.7
Southern willow scrub (including disturbed)	6.8
Mule fat scrub	0.6
Disturbed wetland	0.2
Rare Upland – Tier I	
Scrub oak chaparral	37.4
Maritime succulent scrub	1.4
Native grassland	0.4
Coast live oak woodland	16.3
Uncommon Upland – Tier II	
Diegan coastal sage scrub (including disturbed)	564.1
Coastal sage-chaparral scrub	2.2
Common Upland – Tier III	
Chamise chaparral (including disturbed)	8.3
Southern mixed chaparral	23.9
Poison oak chaparral	9.0
Non-native grassland (including disturbed)	73.3
Other Upland – Tier IV	
Eucalyptus woodland	4.9
Non-native vegetation	40.0
Disturbed habitat	18.2
Developed	42.0
TOTAL	**939.8**

Vernal Pool

Vernal pools are a highly specialized habitat that support a unique flora. Vernal pools are associated with a subsurface hardpan or claypan and depressions or basins (the vernal pools) that pond water. Water collects in these depressions during the rainy season and they completely dry out over the summer. Plant species that were found in the vernal pool community in the Park during the 2004 and 2005 surveys include slender woolly-heads (*Psilocarphus tenellus*), plantain (*Plantago elongata*), crassula (*Crassula aquatica*), long-stalk water-starwort (*Callitriche marginata*), toad-rush (*Juncus bufonius*) and fascicled tarplant (*Deinandra fasciculata*). This community is considered sensitive by the City because it is a wetland. Nine vernal pools occur in the Park (six in the finger canyon near Genesee Avenue and three in the central portion of the Park). The size of the vernal pools varies from as small as 3 square feet to 448 square feet and are up to five or six inches deep. The total area of vernal pools in the Park is 0.4 acre.

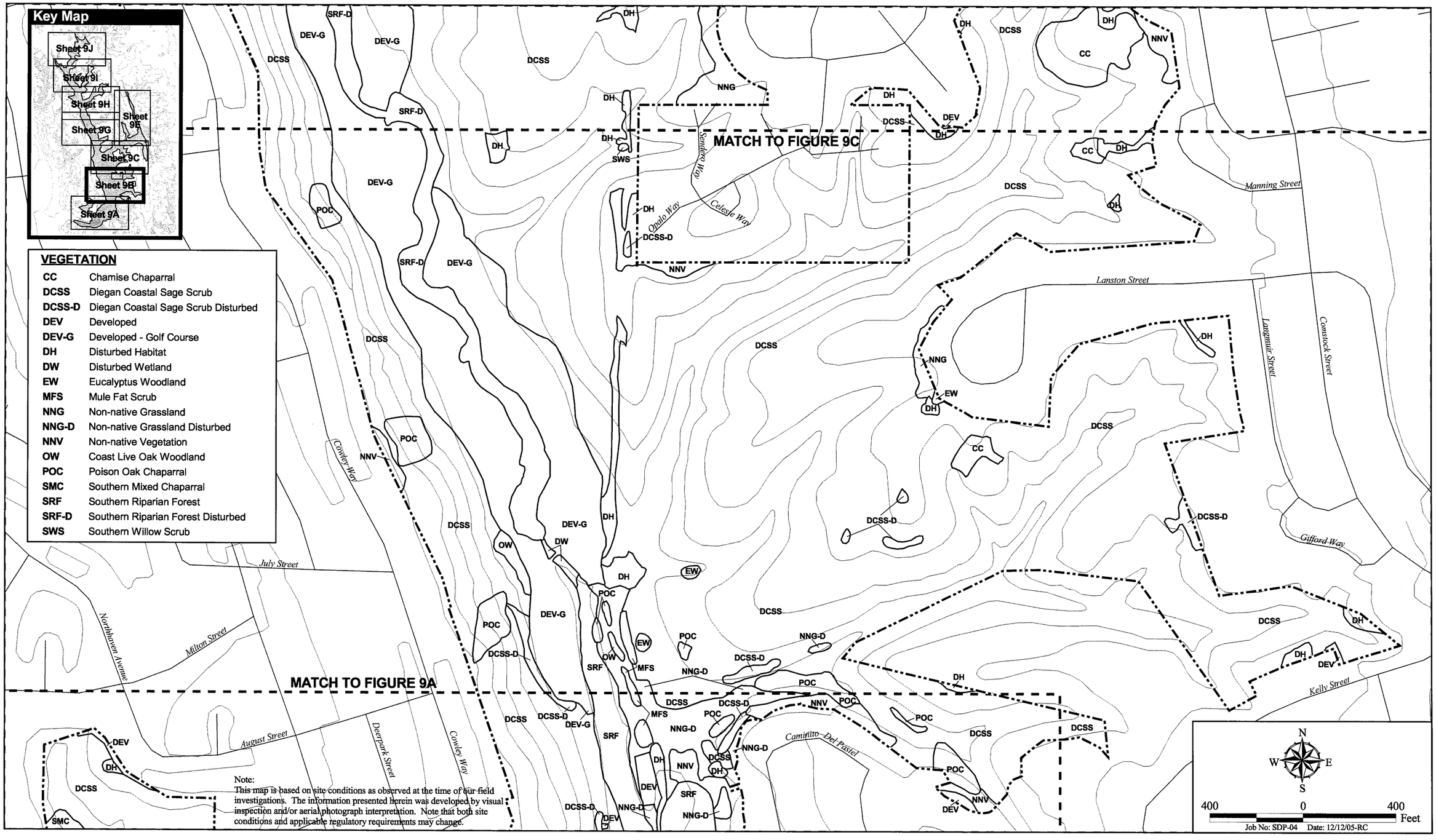


Note:
This map is based on site conditions as observed at the time of our field investigations. The information presented herein was developed by visual inspection and/or aerial photograph interpretation. Note that both site conditions and applicable regulatory requirements may change.

Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

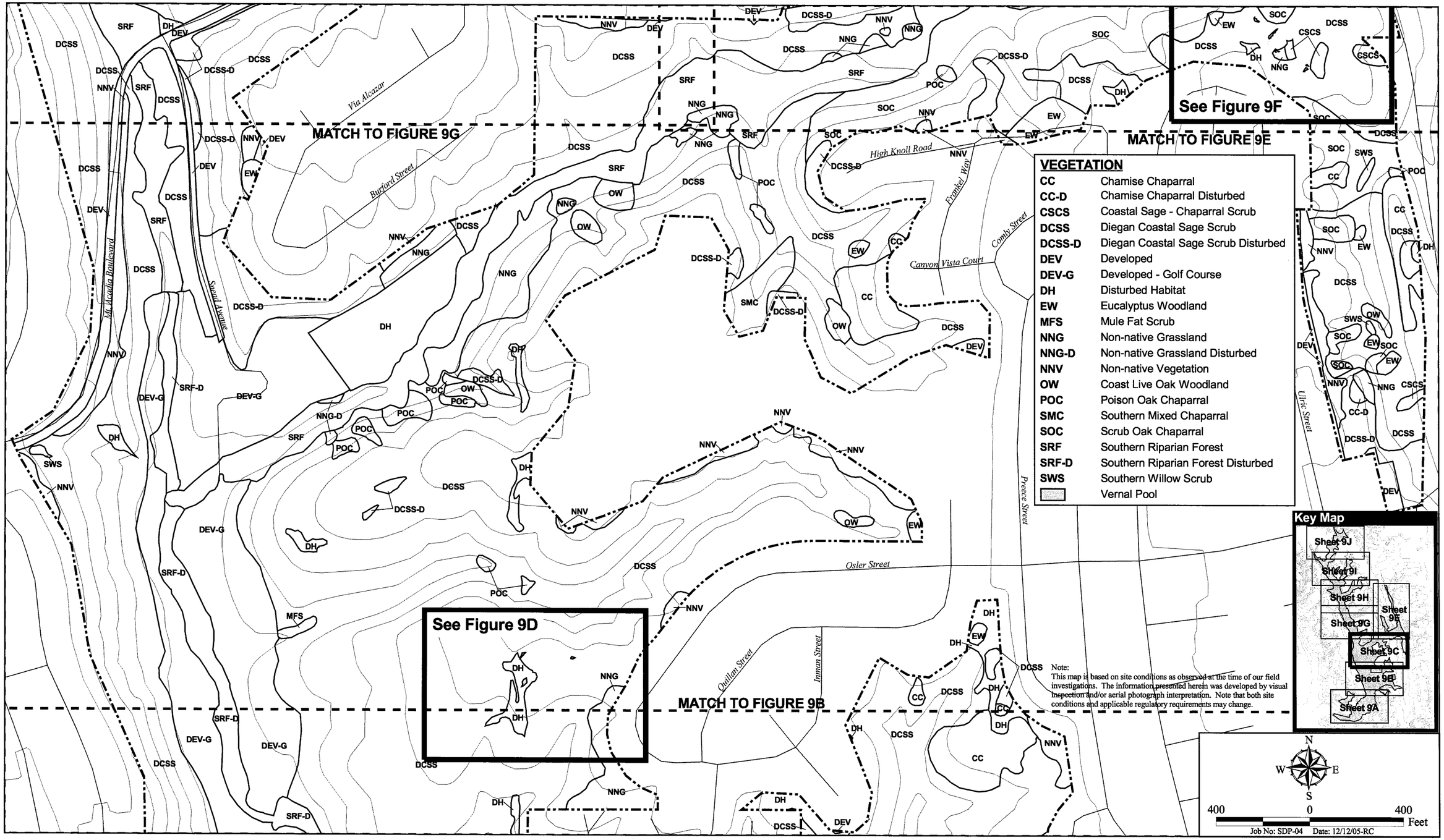
Figure 9A



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

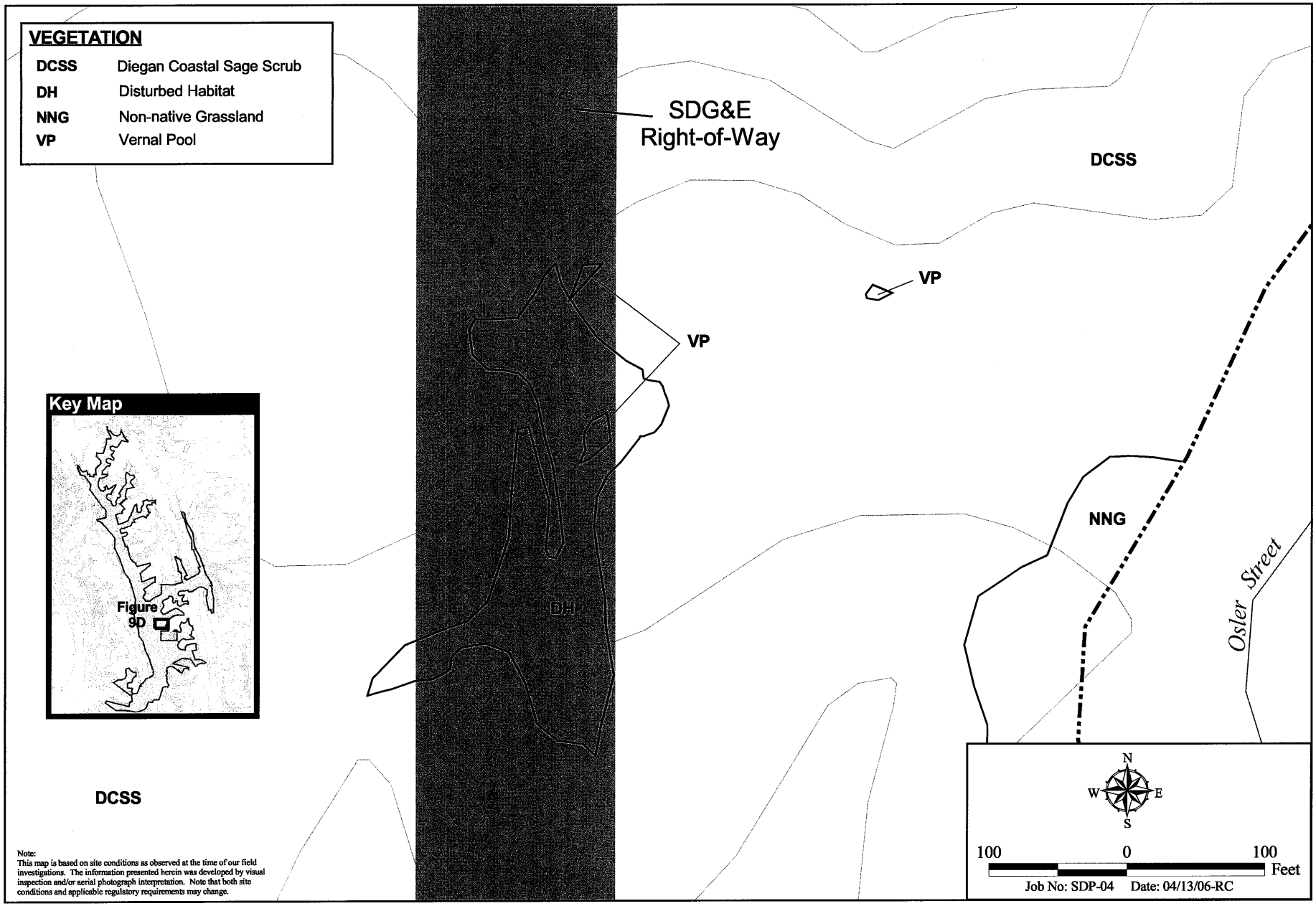
Figure 9B



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

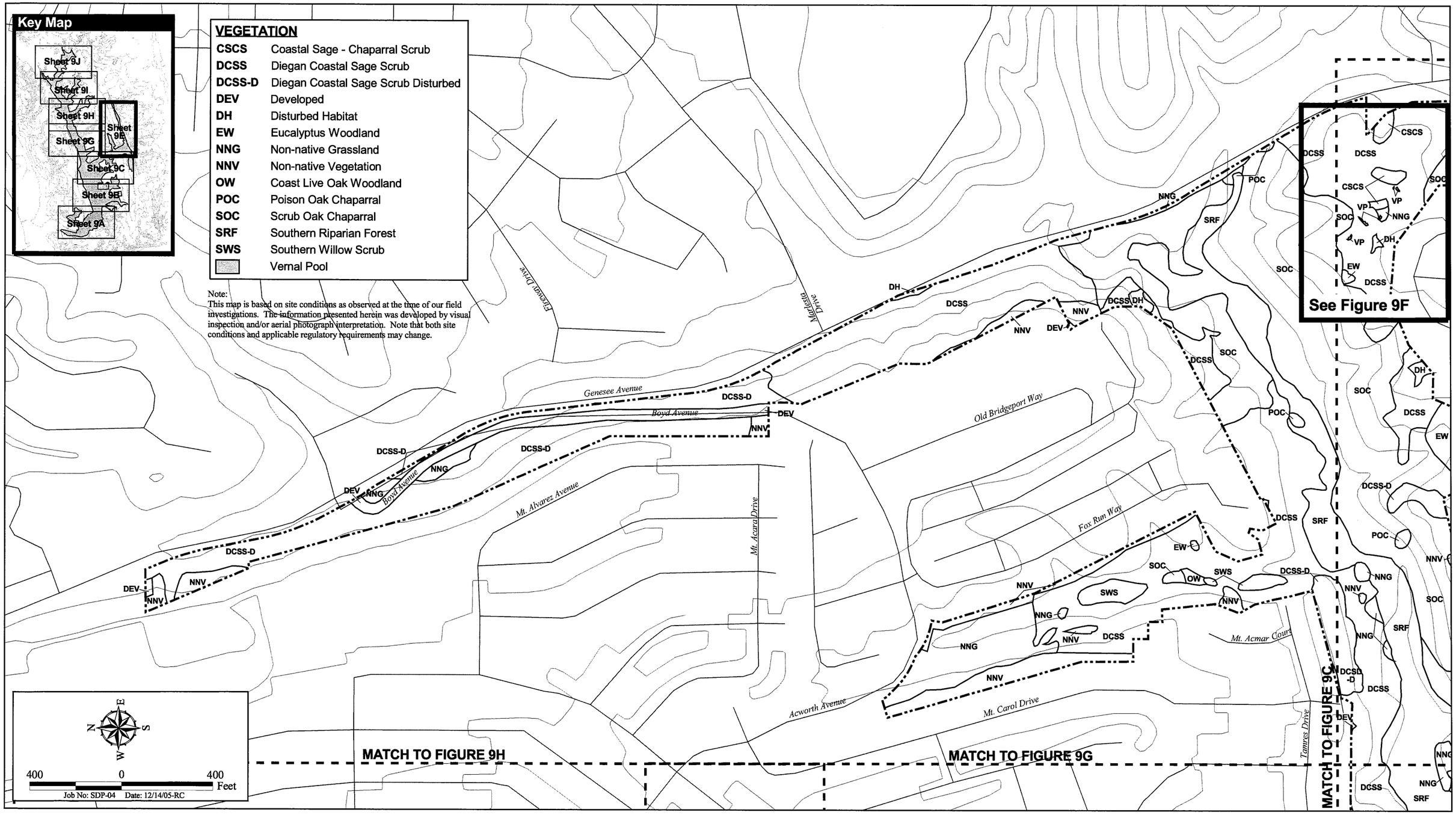
Figure 9C



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

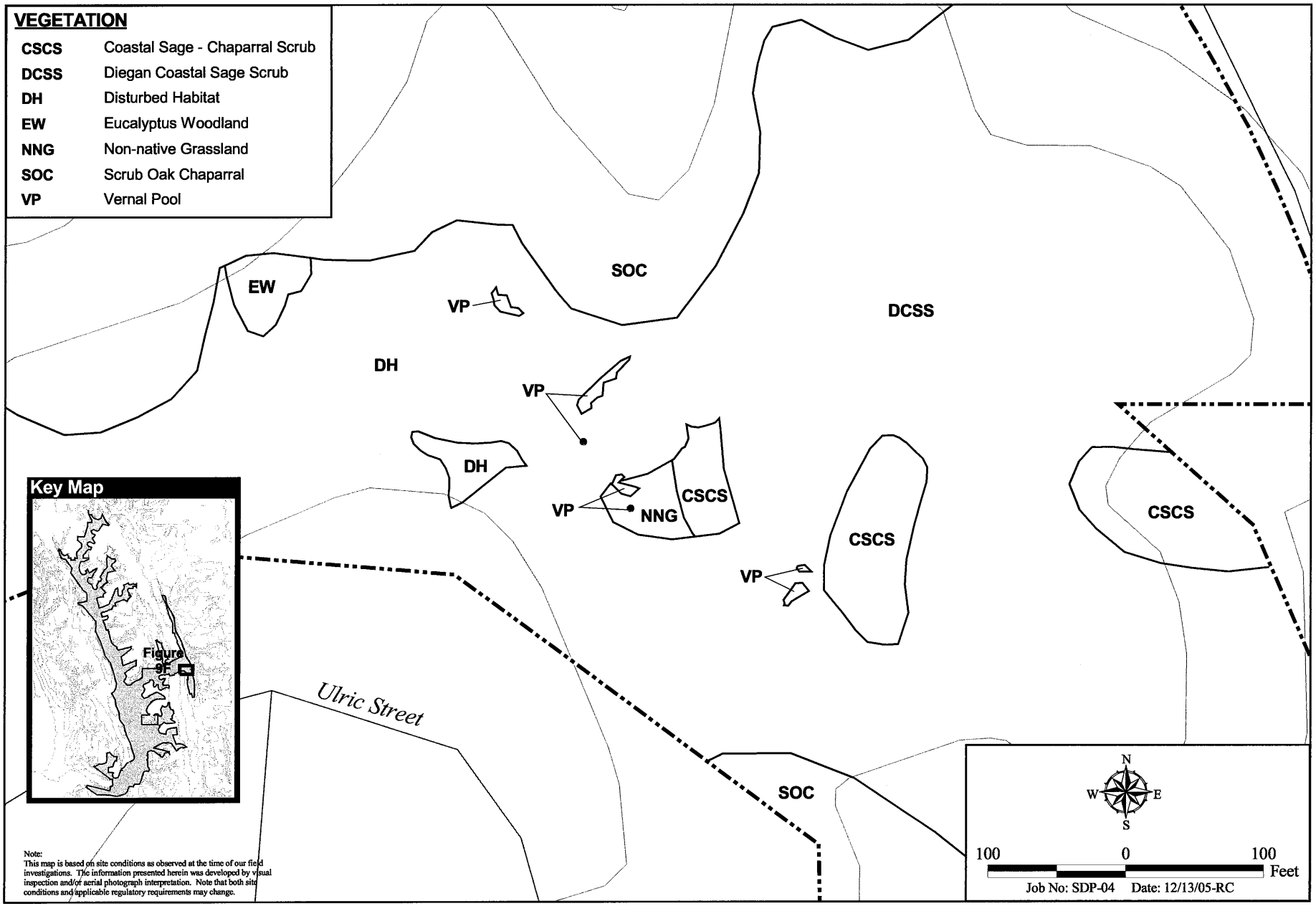
Figure 9D



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

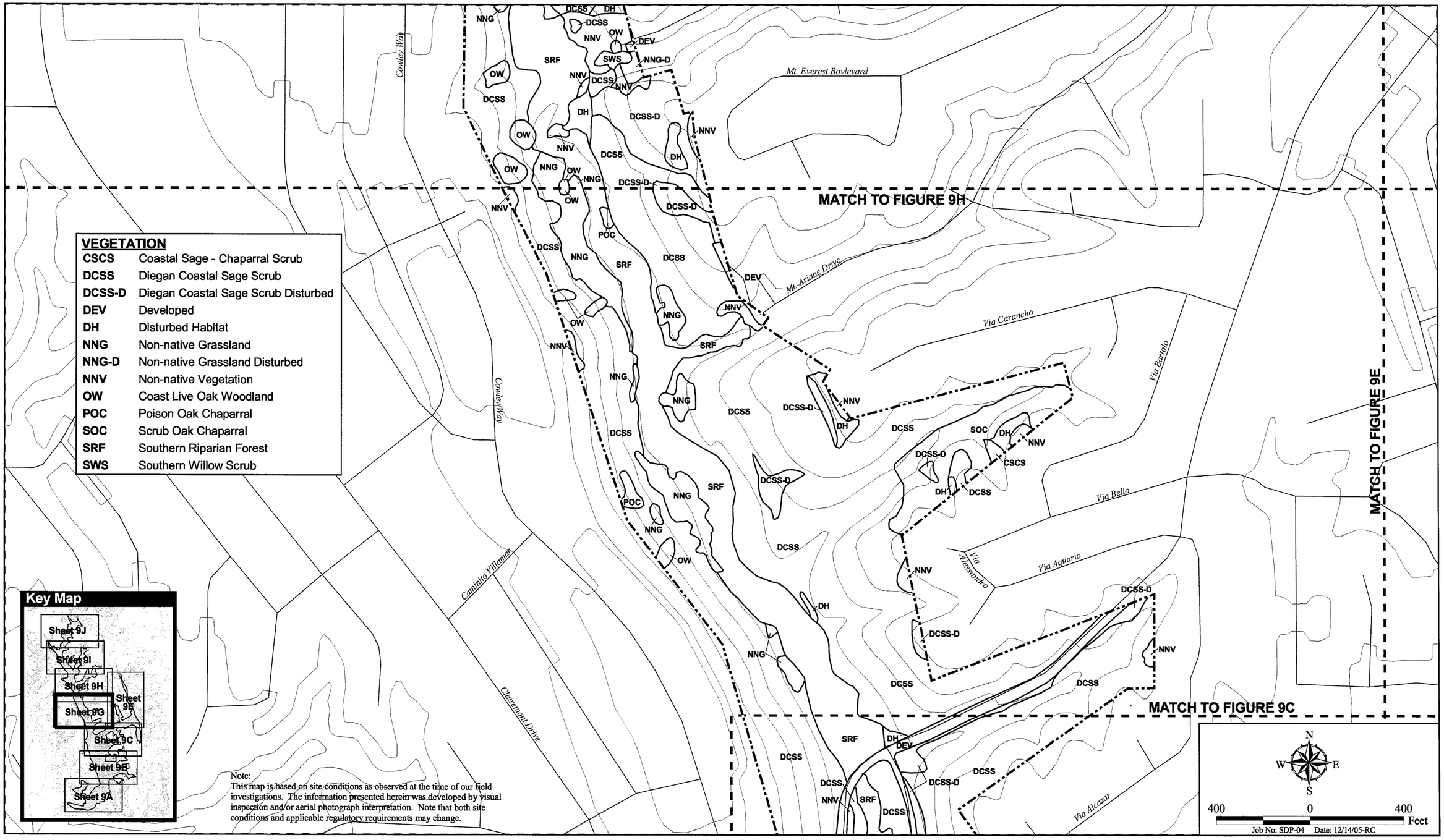
Figure 9E



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

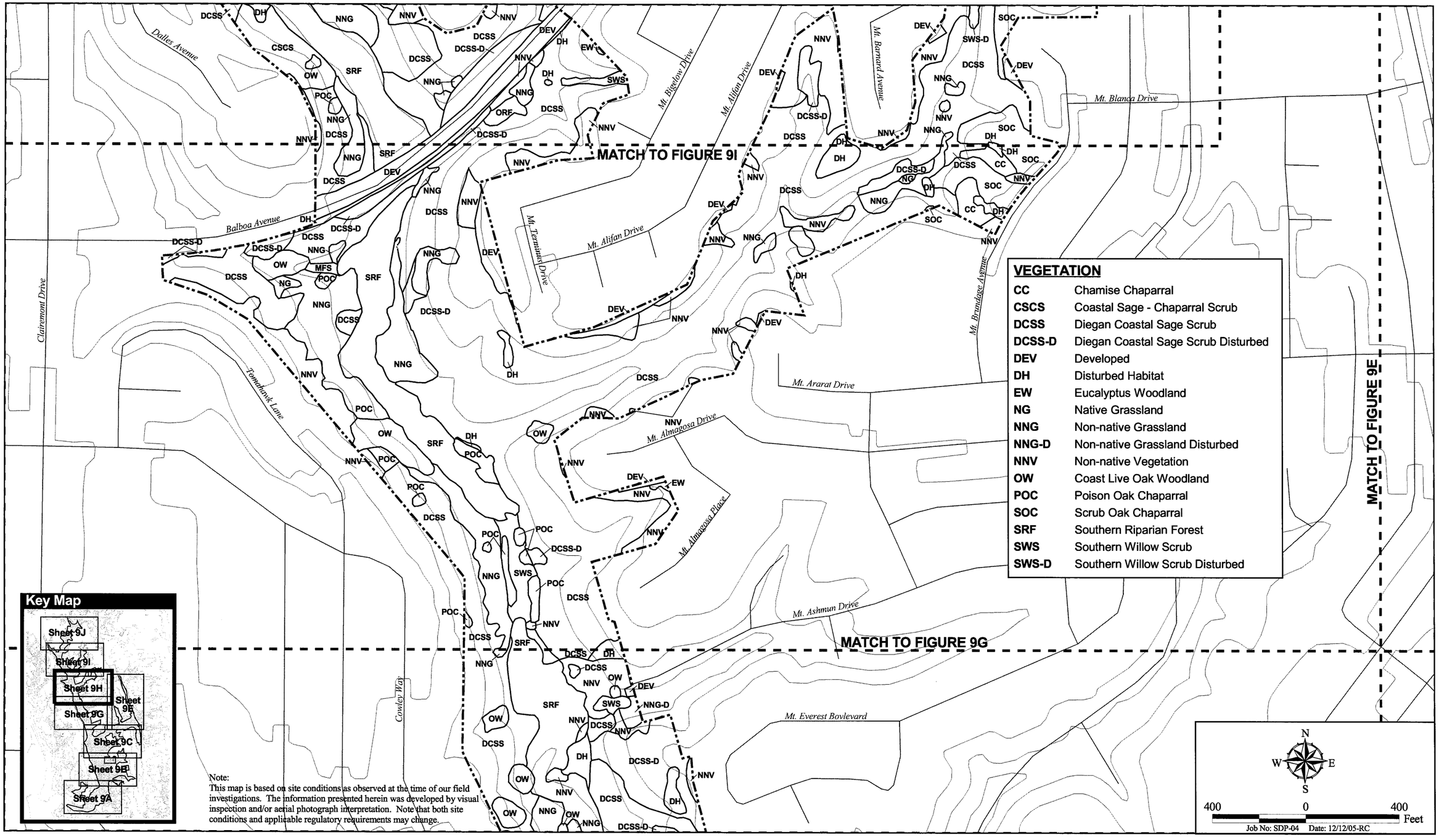
Figure 9F



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 9G

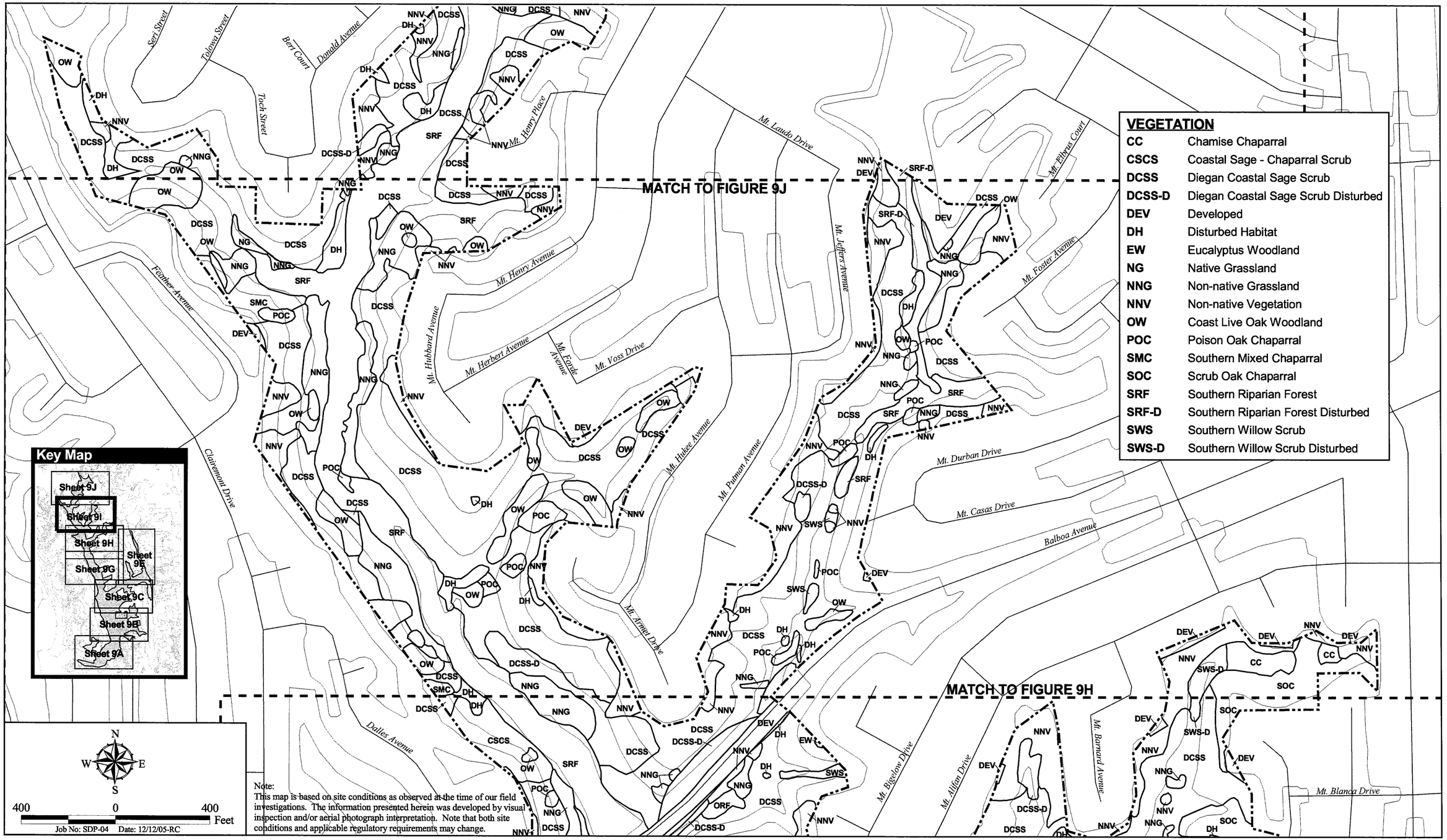


Note:
This map is based on site conditions as observed at the time of our field investigations. The information presented herein was developed by visual inspection and/or aerial photograph interpretation. Note that both site conditions and applicable regulatory requirements may change.

Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

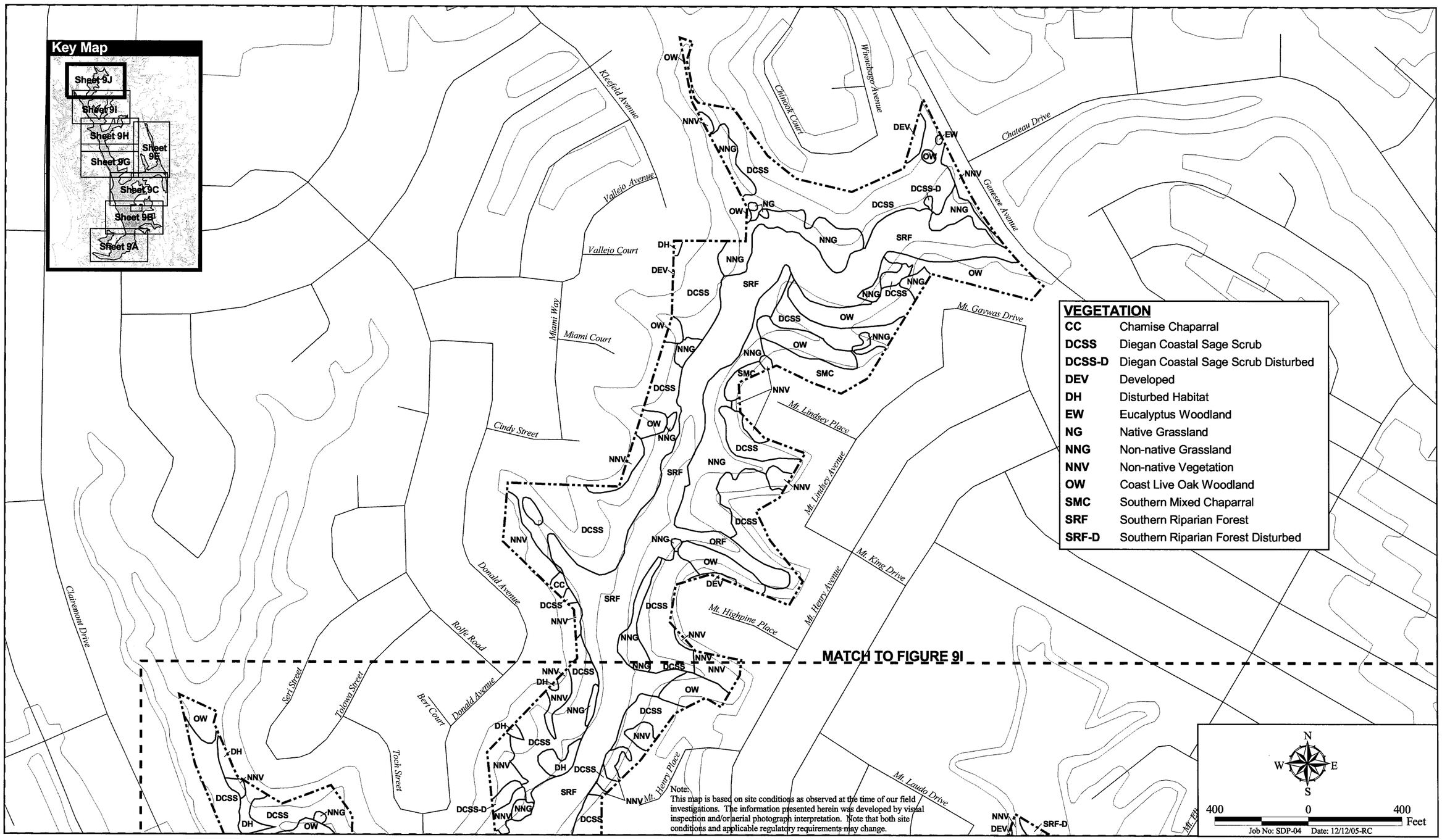
Figure 9H



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 9I



Vegetation Map

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 9J

Southern Riparian Forest

Southern riparian forest in the Park is a mix of coast live oak and cottonwood-willow riparian forests. The canopies of individual tree species overlap so that a canopy cover exceeding 100 percent may occur in the upper tree stratum. Historically, oak riparian forest likely occurred along the intermittent (seasonal) drainage of the canyon and its tributaries. Development in the canyon's watershed has resulted in urban runoff converting the drainages into perennial creeks. With the perennial flows has come a more mesic (moisture-associated) flora adjacent to the creeks. This flora includes willows (*Salix* spp.), cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), cattails (*Typha latifolia*) and bulrush (*Scirpus* sp.). The oak riparian forest component of this community includes coast live oak (*Quercus agrifolia*), poison oak (*Toxicodendron diversilobum*), toyon (*Heteromeles arbutifolia*) and Mexican elderberry (*Sambucus mexicana*). This community is considered sensitive by the City because it is a wetland. Southern riparian forest occurs along most of Tecolote Creek (except for the portion within the golf course) and the main east-west tributary creek near Genesee Avenue. This habitat occupies 81.6 acres in the Park.

Disturbed Southern Riparian Forest

Disturbed southern riparian forest is similar to southern riparian forest except that it includes many non-native subdominant species such as Canary Island date palm (*Phoenix canariensis*), Mexican fan palm (*Washingtonia robusta*), pampas grass (*Cortaderia jubata*) and Brazilian pepper (*Schinus terebinthifolius*). This community is considered sensitive by the City because it is a wetland. Disturbed southern riparian forest occurs along the portion of Tecolote Creek that runs through the golf course and occupies 9.1 acres.

Southern Willow Scrub

Southern willow scrub consists of dense, broadleaved, winter-deciduous stands of trees dominated by shrubby willows in association with mule fat (*Baccharis salicifolia*). This habitat occurs on loose, sandy or fine gravelly alluvium deposited near stream channels during flood flows. Dominant plant species in this community in the Park include arroyo willow (*Salix lasiolepis*) and mule fat. This community is considered sensitive by the City because it is a wetland. Southern willow scrub occurs throughout the Park and occupies 6.0 acres.

Disturbed Southern Willow Scrub

Disturbed southern willow scrub consists of a combination of willows and non-native species, primarily Canary Island date palm and Mexican fan palm. Although it is disturbed, this community is considered sensitive by the City because it is a wetland. Disturbed southern willow scrub occurs in the southern portion of the Park and in the finger canyon to the south of Balboa Avenue and totals 0.8 acre.

Mule Fat Scrub

Mule fat scrub is tall, shrubby riparian scrub community dominated by mule fat and is sometimes interspersed with shrubby willows. This community occurs along intermittent stream channels with a fairly coarse substrate and moderate depth to the water table. This community is maintained by

frequent flooding, the absence of which would lead to a riparian woodland or forest (Holland 1986). Mule fat scrub in the Park is dominated by mule fat but also contains the following characteristic plant species: Mexican elderberry, broom baccharis (*Baccharis sarothroides*), California rose (*Rosa californica*), San Diego sagewort (*Artemisia palmeri*) and arroyo willow. This community is considered sensitive by the City because it is a wetland. Mule fat scrub occurs in the drainages to the south and to the east of the golf course and occupies 0.6 acre.

Disturbed Wetland

Disturbed wetland is dominated by exotic wetland species that have invaded sites that have been previously disturbed or undergo periodic disturbances. Disturbed wetland in the Park consists of sparse mule fat and willows, along with pampas grass and non-native broad-leaved annuals. This community is considered sensitive by the City because it is a wetland. Disturbed wetland occurs in the southern portion of the Tecolote Canyon Golf Course and occupies 0.2 acre.

Maritime Succulent Scrub

Maritime succulent scrub is a low-growing, open scrub community that is dominated by a mixture of stem and leaf succulent species and drought deciduous species that also occur within sage scrub communities. This plant association occurs on thin, rocky or sandy soils on steep slopes of coastal headlands and bluffs. Maritime succulent scrub is restricted to within a few miles of the coast from about Torrey Pines to Baja California and on San Clemente and Catalina Islands. The dominant plant species in this community in the Park include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), coastal prickly-pear (*Opuntia littoralis*), coastal cholla (*Opuntia prolifera*), California desert thorn (*Lycium californicum*), bladderpod (*Isomeris arborea*) and San Diego barrel cactus (*Ferocactus viridescens*). Maritime succulent scrub is considered a rare upland (Tier I) in the City (City 2001). Maritime succulent scrub can be found in the southern portion of the Park and occupies 1.4 acres. Small numbers of native grasses may also be found in various positions of the Park outside the native grassland community.

Native Grassland

Native grassland is a community dominated by perennial bunchgrasses with native annual and perennial forbs. Native grasslands generally occur on fine-textured soils that generally exclude annual, exotic grasses. Almost all of the native grasslands in California have been displaced by non-native grassland dominated by introduced annual species. In the Park, native grassland is dominated by purple needlegrass (*Nassella pulchra*), saltgrass (*Distichlis spicata*), California everlasting (*Gnaphalium californicum*), California buckwheat, sand-aster (*Lessingia filaginifolia*) and blue-eyed grass (*Sisyrinchium bellum*). Native grassland is considered a rare upland (Tier I) in the City (City 2001). Native grassland can be found in patches to the south of Balboa Avenue and in the northern portion of the Park, totaling 0.4 acre. Small numbers of native grasses may also be found in various portions of the Park outside the native grassland community.

Coast Live Oak Woodland

Coast live oak woodland is an open to dense evergreen community dominated by coast live oak. This community occurs along the coastal foothills of the Peninsular Ranges, typically on north-facing slopes

and in shaded ravines (Holland 1986). Associate plant species in this community in the Park include poison oak, toyon and non-native Italian thistle (*Carduus pycnocephalus*). Coast live oak woodland is considered a rare upland (Tier I) in the City (City 2001). Coast live oak woodland can be found on lower elevations throughout the Park, primarily in the northern portion and in the finger canyon near Genesee Avenue, and occupies 16.3 acres.

Diegan Coastal Sage Scrub

Diegan coastal sage scrub occupies xeric (dry) sites characterized by shallow soils. Sage scrub is typically dominated by subshrubs whose leaves fall off during summer drought and are replaced by a lesser amount of small leaves. This adaptation allows these species to better withstand the prolonged drought period in the summer and fall. Sage scrub species have relatively shallow root systems and open canopies. This last trait generally allows for the occurrence of a substantial herbaceous component. In the Park, Diegan coastal sage scrub contains the following dominant plant species: California sagebrush, California encelia (*Encelia californica*), lemonadeberry (*Rhus integrifolia*), laurel sumac (*Malosma laurina*), foothill needlegrass (*Nassella lepida*) and black sage (*Salvia mellifera*). Diegan coastal sage scrub is considered an uncommon upland (Tier II) in the City (City 2001). Diegan coastal sage scrub is the dominant vegetation in the Park. It can be found throughout the Park and occupies 532.7 acres.

Disturbed Diegan Coastal Sage Scrub

Disturbed Diegan coastal sage scrub consists of low-density sage scrub shrubs interspersed with non-native species, including grasses and herbaceous plants. Disturbed Diegan coastal sage scrub is located throughout the Park, primarily in the vicinity of Balboa Avenue, Snead Avenue and Genesee Avenue, and occupies approximately 31.4 acres.

Coastal Sage-Chaparral Scrub

Coastal sage-chaparral scrub is a mixture of hard-leaved chaparral shrubs and drought-deciduous sage scrub species regarded as an ecotone, or transition, between the two vegetation communities. In the Park, this community contains floristic elements of both communities including California sagebrush, chamise (*Adenostoma fasciculatum*) and Nuttall's scrub oak (*Quercus dumosa*). Coastal sage-chaparral scrub is considered an uncommon upland (Tier II) in the City (City 2001). Coastal sage-chaparral scrub can be found in the Park near Genesee Avenue and to the north of Mount Acadia Boulevard and Balboa Avenue. This community occupies 2.2 acres.

Scrub Oak Chaparral

Scrub oak chaparral is a dense evergreen chaparral that can reach a canopy height of up to 20 feet. It is dominated almost exclusively by Nuttall's scrub oak in coastal sandstone situations and scrub oak (*Quercus berberidifolia*) in inland situations. In the Park, scrub oak chaparral is dominated by Nuttall's scrub oak in association with lemonadeberry, laurel sumac, toyon, chamise, black sage, monkeyflower (*Mimulus aurantiacus*) and honeysuckle (*Lonicera subspicata*). Scrub oak chaparral is considered a rare upland (Tier I) in the City (City 2001). It can be found to the north of Mount Acadia Boulevard, to the south of Balboa Avenue and in the finger canyon adjacent to Genesee Avenue in the Park. Scrub oak chaparral occupies 37.4 acres in the Park.

Chamise Chaparral

The most widely distributed chaparral shrub is chamise. This species is found from Baja California, Mexico to northern California in pure or mixed stands. Its ubiquitous distribution may be because it is the only chaparral species that regenerates from fire from both an underground root crown and from seed (Rundel 1986; Parker 1984). It often dominates at low elevations and on xeric, south-facing slopes with 60 to 90 percent canopy cover. Along its lower elevational limit, chamise intergrades with coastal sage scrub (Rundel 1986). In the Park, common species found in chamise chaparral include chamise, rush-rose (*Helianthemum scoparium*), deerweed (*Lotus scoparius*), California sagebrush and fascicled tarplant. Chamise chaparral is considered a common upland (Tier IIIA) in the City (City 2001). Within the Park, chamise chaparral primarily can be found in some of the finger canyons to the east of Tecolote Creek and to the south of Balboa Avenue and occupies 8.2 acres, 0.1 acre of which is disturbed.

Southern Mixed Chaparral

Southern mixed chaparral is composed of broad-, hard-leaved shrubs that grow to approximately six to ten feet tall and form dense, often nearly impenetrable stands. In the Park, southern mixed chaparral is dominated by toyon, lemonadeberry, Mexican elderberry, giant wild rye (*Leymus condensatus*), laurel sumac and poison oak. Southern mixed chaparral is considered a common upland (Tier IIIA) in the City (City 2001). It primarily can be found in the southern portion of the Park near the visitor center, but also occurs in the northern portion of the Park and along its edge. This vegetation community occupies 23.9 acres in the Park.

Poison Oak Chaparral

Poison oak chaparral is dominated by poison oak and often occurs on shady slopes. The primary plant species in this community in the Park are poison oak, coyote brush (*Baccharis pilularis*) and giant wild rye. Poison oak chaparral is considered a common upland (Tier IIIA) in the City (City 2001). Poison oak chaparral can be found in patches throughout the Park and occupies 9.0 acres.

Non-native Grassland

Non-native grassland is a dense to sparse cover of annual grasses, sometimes associated with species of showy-flowered native annual forbs. Most of the species within non-native grassland originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California's. Characteristic species in this community in the Park include brome grasses (*Bromus diandrus*, *B. hordaceus* and *B. madritensis* ssp. *rubens*), purple falsebrome (*Brachypodium distachyon*), fennel (*Foeniculum vulgare*), black mustard (*Brassica nigra*), yellow star-thistle (*Centaurea melitensis*), fescue (*Vulpia myuros*) and Italian ryegrass (*Lolium multiflorum*). Non-native grassland is considered a common upland (Tier IIIB) in the City (City 2001). Non-native grassland occurs on 39.5 acres of land throughout the Park, primarily in its northern portion.

Disturbed Non-native Grassland

Disturbed non-native grassland is similar to non-native grassland except that it contains a low percentage of non-native grassland and a high percentage of exotic forbs such as mustard (*Brassica* sp.) or fennel. Disturbed non-native grassland is considered a common upland (Tier IIIB) in the City

(City 2001). Disturbed non-native grassland occurs on 33.8 acres in the southern portion of the Park, south and west of Tecolote Creek.

Eucalyptus Woodland

Eucalyptus woodland is dominated by eucalyptus (*Eucalyptus* sp.), an introduced genus that produces a large amount of leaf and bark litter. It is thought that the chemical and physical characteristics of this litter may limit the ability of other species to grow under eucalyptus. In most instances, eucalyptus are planted purposely. If sufficient moisture is available, eucalyptus can become naturalized and is able to reproduce and expand its range, particularly in riparian areas. Eucalyptus woodland is considered another upland (Tier IV) in the City (City 2001). It primarily occurs in the southern portion of the Park and in the finger canyon near Genesee Avenue along the edge of the Park.

Non-native Vegetation

Non-native vegetation includes ornamental plant species that may or may not have been planted intentionally. These plants are not maintained or irrigated. In the Park, this community consists of such species as Peruvian pepper (*Schinus molle*) and Brazilian pepper trees, golden wattle (*Acacia longifolia*) and hottentot fig (*Carpobrotus edulis*). Non-native vegetation is considered an other upland (Tier IV) in the City (City 2001). It can be found primarily around the edges of the Park and occupies 40.0 acres, of which nearly half is iceplant (*Mesembryanthemum* spp.).

Disturbed Habitat

Disturbed habitat includes land that has been cleared of vegetation (e.g., dirt roads) or contains a preponderance of non-native plant species such as ornamentals or ruderal, exotic species that take advantage of disturbance (e.g., previously cleared or abandoned landscaping). Disturbed habitat in the Park includes areas of bare ground as well as areas containing exotic plant species such as crystalline iceplant (*Mesembryanthemum crystallinum*), Russian thistle (*Salsola tragus*), garland chrysanthemum (*Chrysanthemum coronarium*) and mustard. Disturbed habitat is considered an other upland (Tier IV) by the City (City 2001). Disturbed habitat occurs in patches throughout the Park and occupies 18.2 acres. A large area of this habitat consists of the golf course driving range.

Developed

Developed land in the Park consists of the Tecolote Canyon Golf Course, roads (Balboa Avenue, Mount Acadia Boulevard, Snead Avenue and Boyd Avenue), infrastructure elements and maintained landscaping. Developed land is not considered a sensitive vegetation community. The golf course is located in the southern portion of the Park, south of Mount Acadia Boulevard. Other developed areas are found along its edges in association with adjacent residential and commercial development and USD. Development occurs on 59.3 acres in the Park, including 42 acres of golf course.

Wildlife

A cumulative list of invertebrates, amphibians, reptiles, birds and mammals observed or detected in the Park since at least 1982 are provided in Appendix A. This list was assembled from lists compiled primarily during short visits to portions of the Park during emergency sewer repairs, although some

other general wildlife surveys were conducted. Focused surveys would be necessary to determine the presence or absence of species not on the list.

Invertebrates

Surveys for invertebrate species were not conducted for the Park; however, based on the variety of habitats present, it is likely that large numbers of species occur there. Many of these species would include but are not limited to spiders, beetles, moths and flies. Species that have been observed include but are not limited to crayfish (undetermined species) and a variety of butterflies such as western tiger swallowtail (*Papilio rutulus*), common white (*Pontia protodice*) and lady (*Vannessa* sp.). Additionally, there are vernal pools in the Park that could support fairy shrimp.

Amphibians

Three amphibian species have been observed in the Park: western toad (*Bufo boreas*), Pacific treefrog (*Hyla regilla*) and African clawed frog (*Xenopus laevis*). The African clawed frog is a non-native, pet frog that has been released into the environment and is totally aquatic and adapted to stagnant water conditions that are present in the Park. Focused surveys for amphibians were not conducted for the Park; however, based on the moist riparian habitats present, it is likely that other species such as garden slender salamander (*Batrachoseps major*) also occur there. The garden slender salamander typically occurs in leaf litter in willow woodland habitat.

Reptiles

Surveys for reptiles were not conducted for the Park; however, based on the habitats present, it is likely that a number of species occur there. For example, a number of species lizards and snakes have been observed including, but not limited to, western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Gerrhonotus multicarinatus*), side-blotched lizard (*Uta stansburiana*), orange-throated whiptail, kingsnake (*Lampropeltis getulus*), gopher snake (*Pituophis melanoleucus*) and western rattlesnake (*Crotalus viridis*). The orange-throated whiptail has a sporadic, but widespread, range in San Diego County. It is locally common in native vegetation, including peripheral wetland habitat. Western fence lizards, side-blotched lizards, gopher snakes and kingsnakes are common to abundant in open areas. The southern alligator lizard is likely found in habitat along the periphery of residential areas. Both the red diamond rattlesnake (*Crotalus exsul*) and the southern pacific rattlesnake (*Crotalus viridis helleri*) frequent riparian areas along with upland habitats. The southern pacific rattlesnake is commonly found throughout the Park. The red diamond rattlesnake has not been seen in the Park for several years, but may still be present (Viator, pers. comm.).

Birds

Approximately 100 species of bird have been observed in the Park. The variety of riparian and upland habitats present in the Park provides opportunities for both common and sensitive species to occur. Bird species include small songbirds to large waterfowl and birds of prey and include species that are resident to the Park year-round and those that migrate through the Park.

A total of approximately 189 birds were counted and 40 species were identified during the bird count surveys. Many more birds occur in the Park, but with the stature and density of the vegetation, the

habits and small size and of many of the birds and the unlimited radius of survey, actual counts of individual birds is not possible. Table 4 below provides a summary of the bird counts. Some of the most commonly counted and/or heard only species in the Park include spotted towhee (*Pipilo maculatus*), mourning dove (*Zenaida macroura*), house finch (*Carpodacus mexicanus*), northern mockingbird (*Mimus polyglottos*), Anna's hummingbird (*Calypte anna*), Pacific slope flycatcher (*Empidonax difficilis*) and wrentit (*Chamaea fasciata*). In addition to the 40 species directly observed and counted or heard only, there were two other bird species observed between bird count stations: parrot (genus and species unknown) and snowy egret (*Egretta thula*).

Table 4
BIRD COUNT SUMMARY

STATION NUMBER	DATE OF COUNT		Total Counted	# Species Heard Only May 7, 2004	# Species Heard Only June 8, 2004
	May 7, 2004	June 8, 2004			
1	10	16	26	11	5
2	14	53	67	14	12
3	11	7	18	14	8
4	15	12	27	9	10
5	1	7	8	13	10
6	6	3	9	7	7
7	7	0	7	17	10
8	6	5	11	7	5
9	13	3	16	5	6
TOTAL BIRDS	83	106	189		

Twelve birds of prey (one eagle, six hawk, three falcon and two owl) have been reported in the Park. Three state and/or federally listed bird species occur in the Park: least Bell's vireo (*Vireo bellii pusillus*, federally and state listed endangered), coastal California gnatcatcher (*Polioptila californica californica*, federally listed threatened) and American peregrine falcon (*Falco peregrinus*, state listed endangered). Other lesser sensitive species (e.g., yellow-breasted chat [*Icteria virens*]) occur as well, along with many common species. Species that utilize the Park's aquatic resources include great blue heron (*Ardea herodias*), black-crowned night heron (*Nycticorax nycticorax*), belted kingfisher (*Ceryle alcyon*), mallard (*Anas platyrhynchos*) and snowy egret (*Egretta thula*). The nest parasitic brown-headed cowbird also was observed.

Mammals

Most of the native mammals typically found in riparian/upland habitats in coastal San Diego County are expected to occur in the Park. Sixteen of these were observed (many by sign such as tracks and scat) in the Park. No focused surveys were conducted for mammals, so others, especially rodents and bats, are expected to occur. The mammals in the Park range from small rodents such as the deer mouse (*Peromyscus maniculatus*) to medium-sized raccoons (*Procyon lotor*) and large coyotes. The Virginia opossum has also been reported in the Park. This marsupial was introduced to San Jose, California in

1910 and has spread throughout California (Jameson and Peeters 1988). The larger mule deer (*Odocoileus hemionus*) and mountain lion (*Felis concolor*) previously were present but have not been observed in the Park in recent years, likely because the Park is not connected with larger blocks of habitat that these species require.

Wildlife Corridors

A wildlife corridor is "a linear landscape feature that allows animal movement between two patches of habitat or between habitat and geographically discrete resources" (City 1996). Corridors are very important for large mammals, especially predators. There are two types of corridors: regional and local. Regional corridors allow species to migrate seasonally and disperse individuals to other areas and meet other subpopulations. Local routes allow individuals to hunt, forage and find water and den sites. Corridors are defined or constrained by various factors, such as topographic features, habitat, availability of natural and passable open space, game trails and/or urban pressures (e.g., noise, lighting, lack of vegetative cover and domestic animals).

Tecolote Canyon is considered an urban habitat area within the City's MHPA. The Park is located in a narrow coastal valley that is completed surrounded by urban development. According to the City's MSCP Subarea Plan (City 1997), Tecolote Canyon contributes "in some form to the MHPA, either by providing habitat for native species to continue to reproduce and find new territories, or by providing necessary shelter and forage for migrating species (mostly birds)." Additionally, "[t]he optimum future condition for the urban habitat lands . . . is a system of canyons that provide habitat for native species remaining in urban areas, 'stepping stones' for migratory birds and those establishing new territories, and environmental educational opportunities for urban dwellers." Since Tecolote Canyon is surrounded by urbanization, is crossed by roadways placed on fill material and contains the Tecolote Canyon Golf Course, it is not conducive for use by larger mammals such as mule deer and mountain lion that require bigger blocks of habitat. The coyote, another large mammal, has been observed in the Park; however, the coyote is known to be a species that can adapt to nearby urbanization. The Park does not provide connectivity with other blocks of habitat to allow for movement of other animals either (except birds) into and out of the canyon to other habitat areas. Tecolote Canyon does, however, meet the goals of an urban habitat land by providing habitat in an urban area, providing a stepping stone for migratory birds, and with the nature center and trails, provides interpretive and educational opportunities for urban dwellers.

Sensitive Species

Twenty-four sensitive plant and animal species have been observed or detected within the Park (Figure 10, *Sensitive Species*). Sensitive plant and animal species have usually gained this status due to a loss of appropriate habitat. Protection of habitat, therefore, is important in the preservation of sensitive species. Sensitive species fall under one or more of the following categories: federally or state listed species or those that are candidates for listing, U.S. Fish and Wildlife Service species of concern, species that are on the California Native Plant Society's list of rare or endangered vascular plants, CDFG fully protected species, CDFG species of special concern, MSCP covered species and/or City narrow endemic species.

Sensitive species covered under the City MSCP Subarea Plan (urban habitat lands) include eight plant, one reptile, seven bird, and one mammal species. Of these, two plant, one reptile and two bird species are known to occur in the Park and require area specific management measures. One additional plant,

HELIX Observed Species

Sensitive Plant Species

AP	San Diego Sagewort	*(Artemisia palmeri)*
FV	San Diego Barrel Cactus	*(Ferocactus viridescens)*
JA	Southwestern Spiny Rush	*(Juncus acutus* ssp. *leopoldii)*
QD	Nuttall's Scrub Oak	*(Quercus dumosa)*
VL	San Diego County Viguiera	*(Viguiera laciniata)*

Sensitive Animal Species

CAGN	Coastal California Gnatcatcher	*(Polioptila californica californica)*
COHA	Cooper's Hawk	*(Accipiter cooperii)*
LBVI	Least Bell's Vireo	*(Vireo bellii pusillus)*
OTWH	Orange Throated-whiptail	*(Aspidoscelis hyperythra beldingi)*
PEFA	American Peregrine Falcon	*(Falco peregrinus anatum)*
YBCH	Yellow-breasted Chat	*(Icteria virens)*
YEWA	Yellow Warbler	*(Dendroica petechia brewsteri)*

Species Observed by Others*

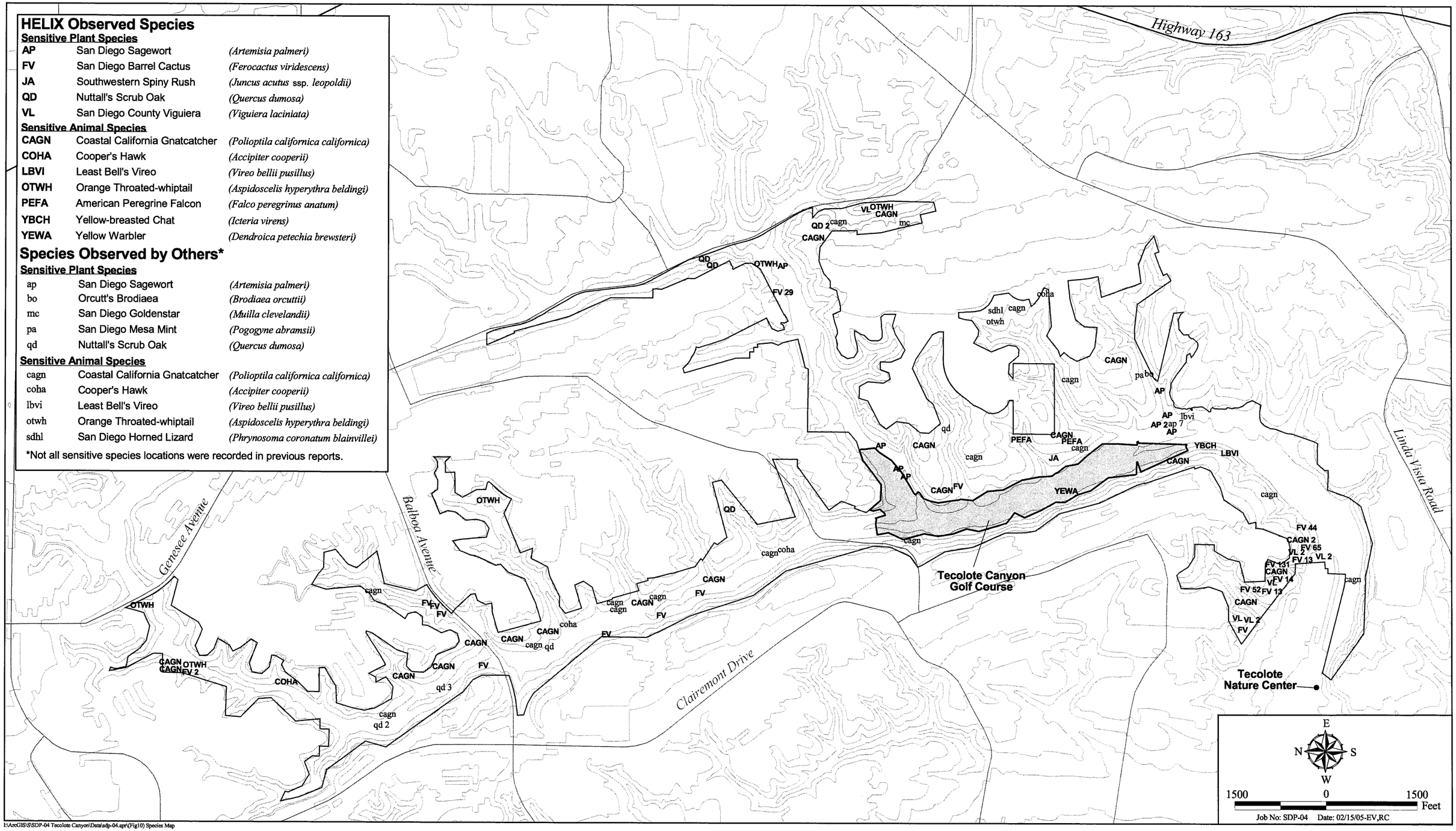
Sensitive Plant Species

ap	San Diego Sagewort	*(Artemisia palmeri)*
bo	Orcutt's Brodiaea	*(Brodiaea orcuttii)*
mc	San Diego Goldenstar	*(Muilla clevelandii)*
pa	San Diego Mesa Mint	*(Pogogyne abramsii)*
qd	Nuttall's Scrub Oak	*(Quercus dumosa)*

Sensitive Animal Species

cagn	Coastal California Gnatcatcher	*(Polioptila californica californica)*
coha	Cooper's Hawk	*(Accipiter cooperii)*
lbvi	Least Bell's Vireo	*(Vireo bellii pusillus)*
otwh	Orange Throated-whiptail	*(Aspidoscelis hyperythra beldingi)*
sdhl	San Diego Horned Lizard	*(Phrynosoma coronatum blainvillei)*

*Not all sensitive species locations were recorded in previous reports.



E:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig10) Species Map

Sensitive Species

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 10

one additional reptile and three additional bird species that are MSCP covered species, but that were not noted by the MSCP as found in urban habitat lands also have been observed in the Park. An additional five plant, two invertebrate, one reptile and one bird species that require area specific management measures have not been previously documented, but are considered to have potential to occur in the Park. These species are discussed in detail in this section. Other sensitive species that were observed or that could occur but that do not have MSCP management directives associated with them are summarized in Tables 5 and 6, respectively. Status codes are explained at the end of Appendix A. For completeness, MSCP covered species that are not known or considered to have potential to occur in the Park are listed in Appendix B.

Sensitive Plant Species

Ten sensitive plant species have been observed in the Park. Rainfall in 2004, when rare plant surveys were conducted, was approximately half of normal. As a result, some herbaceous sensitive plant species that were not observed nonetheless may occur in the Park. Additional rare plant surveys are, therefore, recommended in an average to above-average rainfall year.

San Diego barrel cactus (*Ferocactus viridescens*)
Presence in the Park: This species was observed throughout the Park, primarily in its southern portion (Figure 10; HELIX 2004).
Habitat: San Diego barrel cactus occurs in western San Diego County in chaparral, Diegan coastal sage scrub, foothill grassland and vernal pools habitats. This barrel cactus prefers stockpen gravelly clay loams, San Miguel-Exchequer rocky silt loams and Redding gravelly loams. It is often located at the crest of slopes and among cobbles at an elevation range of 3 to 450 meters. This cactus has been previously located at the Naval Submarine Base at Point Loma, Miramar Airfield lands, the east end of Otay Valley, Otay Mesa and the flanks of Mother Miguel Mountain east of Bonita.
Flowering: This succulent is a low, dome-like perennial cactus that flowers from May through June.
Status: This plant is on the CNPS List 2, R-E-D 1-3-1 and is an MSCP covered species. Due to the reduction of habitat by urbanization, off-road vehicles, non-native plants, agriculture and commercial exploitation (horticultural collecting), this species is in decline.
MSCP Conditions: The area specific management directives must include measures to protect this species from edge effects, unauthorized collection and include appropriate fire management/control practices to protect against a too frequent fire cycle.

Wart-stemmed ceanothus (*Ceanothus verrucosus*)
Presence in the Park: This species occurs in a large area of Kearny Mesa, including Tecolote Creek, and is presumed extant (CNDDB 2005). This species was detected in the Park in 2003 (Dudek 2003b), but the specific location was not documented.
Habitat: Wart-stemmed ceanothus occurs in coastal San Diego County and has been previously identified in Agua Hedionda, Encinitas, Leucadia, Torrey Pines State Reserve, Kearny Mesa, Lake Hodges and Point Loma. It prefers dry hills and mesas in southern maritime and mixed chaparral habitats at an elevation range of 1 to 380 meters.
Flowering: This erect, stiff-branched, rounded evergreen shrub is about one to three meters in height. It has bumpy, rough stipules where the leaves connect to the stem, giving the stems a warty appearance and its name. The flowering season for this plant is from December through April.
Status: This plant is listed on CNPS List 2, R-E-D 2-2-1 and is threatened by development.

MSCP Conditions: Revegetation efforts are required within appropriate habitats and must include restoration of this species. Area specific management directives for the protected populations must include specific measures to increase populations and address the autecology and natural history of the species and to reduce the risk of catastrophic fire. Management measures to accomplish this could be a prescribed fire. Any newly found populations should be evaluated for inclusion in the preserve strategy through acquisition, like exchange, etc.

Shaw's agave (*Agave shawii*)

Presence in the Park: Observed in the Park by Dudek (2003a), but the specific location was not documented. Dudek staff recollected that this plant was located in Diegan coastal sage scrub adjacent to Caminito del Oeste (Priest, pers. comm.).

Habitat: This species occurs in fewer than five areas in San Diego County. The preferred habitats are coastal bluff scrub and coastal scrub at elevations ranging from 10 to 75 meters.

Flowering: This shrub, leaf succulent flowers from September to May.

Status: This plant is listed on CNPS List 2, R-E-D 3-3-1 and is on the MSCP's list of narrow endemics. All known extant populations are within public land (Torrey Pines State Reserve, Point Loma military base and Border Field State Park).

MSCP Conditions: The area-specific management directives must include specific measures to protect against detrimental edge effects.

Orcutt's brodiaea (*Brodiaea orcuttii*)

Presence in the Park: This species has been observed in the Park in the past (Figure 10) and was last reported in 1940 but is presumed extant (CNDDB 2005). It was located west of Linda Vista Road in an area that appears to be just west of Kelly Street Park.

Habitat: Closed-cone coniferous forest, chaparral, cismontane woodland, meadows and seeps, valley and foothill grassland and vernal pools are the habitats this species prefers. In vernal pools, it prefers the swales leading into the more developed pools. It grows in mesic clay and sometimes serpentine soils at an elevation range of 30 to 1,615 meters. The range of the plant is from Riverside County to San Diego County. In San Diego County, occurs from the coastal areas of Carlsbad south to Otay Mesa to the inland areas of Cuyamaca Peak and Cuyamaca Lake.

Flowering: This species is a herbaceous perennial (bulbiferous) corm with blue flowers on a leafless stalk. The flowering season is April through July.

Status: This plant is currently designated on the CNPS List 1B, R-E-D 1-3-2 and is a MSCP covered species. It is threatened by development, vehicles, road construction and dumping.

MSCP Conditions: The area specific management directives must include specific measures to protect the species from detrimental edge effects.

San Diego button-celery (*Eryngium aristulatum* var. *parishii*)

Presence in the Park: This species was observed in 1979 approximately 0.75 mile north of the Mission Valley shopping center and is presumed extant (CNDDB 2005). This species is potentially present in the Park.

Habitat: This species has been previously located in Camp Pendleton, San Marcos, Miramar Naval Air Station, Clairemont Mesa, College Grove and Otay Mesa of Riverside and San Diego Counties. The habitats this species occurs in are valley and foothill grassland, coastal scrub and vernal pools. It prefers mesic soils like Redding gravelly loams at an elevation range of 20 to 620 meters.

Flowering: This plant is an annual/perennial herb that flowers from April through June.

Status: San Diego button-celery is federally and state listed endangered, is on the CNPS List 1B and R-E-D 2-3-2, is a MSCP covered species and a City narrow endemic. This plant is highly sensitive and occurs in a limited habitat area. Agriculture, urbanization, road maintenance, grazing, vehicles and foot traffic threaten the San Diego button-celery population.
MSCP Conditions: The area specific management directives must include measures to protect against detrimental edge effects.

San Diego goldenstar (*Muilla clevelandii*)
Presence in the Park: This species was last reported in 1940 but is presumed extant. It was located in the finger canyon adjacent to Genesee Avenue (Figure 10; CNDDB 2005). This species is potentially still present in the Park.
Habitat: San Diego goldenstar is found in southern San Diego County. The habitats it prefers are chaparral, coastal scrub, valley and foothill grassland, the edge of vernal pools and in open locales with stockpen gravelly clay loam soil. This species occurs at the 50- to 465-meter elevation range and has been previously located in Carlsbad, MCAS Miramar, Otay Ranch and 4S Ranch.
Flowering: This herbaceous, bulbiferous perennial. It produces yellow flowers from April through June.
Status: This species is on CNPS List 1B as R-E-D 2-3-2. Urbanization, road construction, off-road vehicles and illegal dumping threaten it.
MSCP Conditions: The area specific management directives must include monitoring of transplanted populations and specific measures to protect against detrimental edge effects.

San Diego mesa mint (*Pogogyne abramsii*)
Presence in the Park: This species was last reported in 1938 in the southern portion of the Park adjacent to Kelly Street Park (Figure 10; CNDDB 2005). Although the previously documented location has been extirpated, the species is potentially present elsewhere in the Park.
Habitat: Occurs in western San Diego County at a 90- to 200-meter elevation range. It exclusively occurs in vernal pools on mesas north of the San Diego River. Previously, it has been located in the Del Mar Mesa and MCAS Miramar areas.
Flowering: This species is a small aromatic annual herb that blooms profusely in vernal pools, to a point of blanketing the pool basins. It can be identified by its minty odor and it flowers from April through July.
Status: This plant is listed as federally and state endangered, is on CNPS List 1B and R-E-D 2-3-3, is a MSCP covered species and is a City narrow endemic. Vehicles, dumping, road maintenance and urbanization seriously threaten it.
MSCP Conditions: The preserve management plan must include measures to protect against detrimental edge effects; maintain surrounding habitat for pollinators; and maintain pool watershed areas.

San Diego thorn-mint (*Acanthomintha ilicifolia*)
Presence in the Park: This species has not been previously documented in or near the Park, but nonetheless has potential to occur.
Habitat: San Diego thorn-mint occurs in San Diego County and Baja California, Mexico at elevations ranging from 10 to 935 meters. This plant prefers clay soils in chaparral, coastal scrub, valley and foothill grasslands and vernal pools.
Flowering: This annual herb flowers between April and June.

Status: This species is listed as federally threatened and state endangered. In addition, this species is on CNPS List 1B as R-E-D 2-3-2 and is on the MSCP's list of narrow endemics. Approximately 40 percent of the historical occurrences of San Diego thorn-mint in California have been extirpated. This species is threatened by urbanization, road construction, vehicles, grazing, trampling, erosion and non-native plants. Reintroduction of this species has been attempted, but few have survived.
MSCP Conditions: The area-specific management directives and the SPA for the Otay Lakes Resort area must include specific measures to protect against detrimental edge effects from the surrounding development.

Variegated dudleya (*Dudleya variegata*)
Presence in the Park: This species has not been previously documented in or near the Park, but nonetheless has potential to occur.
Habitat: Variegated dudleya occurs in San Diego County and Baja California, Mexico at elevations from 3 to 300 meters. Found on dry hillsides and mesas, in both foothill and coastal areas. This species is usually found growing in clay soils of chaparral, cismontane woodland, coastal scrub, valley and foothill grasslands and vernal pools.
Flowering: This perennial herb flowers from May to June.
Status: Development and grazing threaten this species. This species is listed on the CNPS List as 1B; R-E-D 2-2-2. It also is an MSCP narrow endemic species.
MSCP Conditions: The area-specific management directives must include species-specific monitoring and specific measures to protect against detrimental edge effects to this species, including effects caused by recreational activities. Some populations now occur within a major amendment area (Otay Mountain) and at the time permit amendments are proposed, strategies to provide protection for this species within the amendment area must be included.

Willowy monardella (*Monardella linoides* ssp. *viminea*)
Presence in the Park: This species occurs in San Clemente Canyon to the north of the Park and is presumed extant (CNDDB 2005). It was last reported in this location in 1993. Willowy monardella is potentially present in the Park, although little appropriate habitat (seasonally dry cobblestone washes) is present.
Habitat: Willowy monardella occurs in San Diego County in closed cone coniferous forest, chaparral, coastal scrub, riparian scrub and riparian woodland habitats. It is typically found along dry cobblestone streambeds. It prefers elevations between 50 and 400 meters. Fewer than 50 occurrences of this species are located in California.
Flowering: This perennial herb flowers between May and August.
Status: This species has been listed as federally and state endangered, is on the CNPS List 1B, R-E-D 3-3-3 and is an MSCP covered species. It is threatened by urbanization, road improvements, vehicles and non-native plants.
MSCP Conditions: The area specific management directives must include specific measures to protect against detrimental edge effects.

Table 5
SENSITIVE PLANT SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN TECOLOTE CANYON FOR WHICH NO SPECIFIC MSCP MANAGEMENT DIRECTIVES HAVE BEEN ADOPTED

Subarea Plant Status: *CS=MSCP Covered; NC=Not MSCP Covered; NE=Not Eval.*

Subarea Plan Status	*Scientific Name* Common Name	Status*	CNPS		NDDB Rank		TCNP NRMP Area Notes
			List	R-E-D Code	Global	CA	
NE	*Adolphia californica* California adolphia	--/--	2	1-3-1	G3G4	S3.1	Low to moderate potential to occur. Habitat is clay soils on south-facing slopes in chaparral and coastal sage scrub. Would likely have been observed if present.
NE	*Artemisia palmeri* San Diego sagewort	--/--	4	1-2-1	G3	S3.2	Observed in several locations in the southern half of the Park (Figure 10; HELIX 2004, Tierra 2004, Dudek 2003a and b and Earth Tech 2003).
NC	*Chorizanthe orcuttiana* Orcutt's spineflower	FE/SE	1B	3-3-3	G1	S1.1	Low potential to occur. Only one site is known to be extant. This species occurs in coastal chaparral openings in chamise with a distinctive loose sandy substrate (Reiser 2001).
NE	*Comarostaphylis diversifolia* ssp. *diversifolia* Summer holly	--/--	1B	2-2-2	G3?T2	S2.2	An evergreen shrub that occurs in chaparral and cismontane woodland. Reported to the CNDDB in the 1980s approximately two-thirds mile east of Interstate 805 and one-quarter mile south of San Clemente Canyon (CNDDB 2005). This species is potentially present in the Park.
NE	*Harpagonella palmeri* Palmer's grapplinghook	--/--	4	1-2-1	G4	S3.2	Low potential to occur. Occurs in clay soils in chaparral, coastal sage scrub and grassland.
NC	*Juncus acutus* ssp. *leopoldii* Southwestern spiny rush	--/--	4	1-2-1	G5T5	S3.2	Observed in the main drainage in the southern portion of the Park (HELIX 2004).
NC	*Quercus dumosa* Nuttall's scrub oak	--/--	1B	2-3-2	G2	S1.1	Observed scattered throughout the northern two-thirds of the Park (Figure 10; HELIX 2004, Tierra 2004, Dudek 2003b and Tecolote Canyon CAC 1982).
NC	*Viguiera laciniata* San Diego County viguiera	--/--	4	1-2-1	G4	S3.2	Observed the eastern and southern portions of the Park (Figure 10; HELIX 2004, Earth Tech 2003 and Tecolote Canyon CAC 1982).

*A listing and explanation of status codes are provided at the end of Appendix A.

Sensitive Animal Species

Fourteen sensitive animals species have been observed or detected in the Park. Other sensitive species are likely to occur in the Park that were not observed or detected because comprehensive surveys in different seasons and at different times of day, as well as trapping surveys, were not conducted.

Riverside fairy shrimp (*Streptocephalus woottoni*)
Presence in the Park: Low potential to occur in vernal pools in the Park. The vernal pools are likely too shallow and likely do not hold water long enough to support this species.
Habitat Preferred: Vernal pools.
Food: Adults feed by filtering suspended solids from the water column. Nearly all species of fairy shrimp feed on algae, bacteria, protozoa, rotifers and bits of organic matter (Eng et al. 1990, Pennak 1989). Young shrimp swim on their backs as they filter algae with their 11 pairs of leaf-like legs.
Breeding/Relevant Life History: This species is dependent on warm water (temperatures between 59 to 63 degrees Fahrenheit) for hatching and temperature is the main factor in the temporal limitations of the species. Eggs will not hatch when the water temperature is above 77 degrees Fahrenheit, which ensures that short summer rains do not trigger the hatching of eggs when the conditions are insufficient to support development. Maturation is slow and takes approximately 28 days or more, hence the need for deeper pools that retain water for longer periods of time. Mating occurs immediately upon maturation (Simovich 1990) and the life span is approximately three months. Eggs that are laid by the female settle into the mud at the bottom of the pool (Brown and Carpelan 1971) and remain viable until the proper conditions for hatching arise, usually during the next rainy season. Riverside fairy shrimp are osmoregulators that maintain constant internal chemistry, but cannot tolerate large fluctuations in their external environment (Zedler et al. 1990 and Hathaway et al. 1992). Young hatch from encysted embryos, or eggs, after a recent rainfall in which water has ponded.
Status/Predators: FE/MSCP covered species. Fairy shrimp are fed upon by waterfowl (Krapu 1974; Swanson et al. 1974) and other vertebrates, such as western spadefoot toad (*Scaphiopus hammondi*) tadpoles (Branchiopod Research Group 1996).
MSCP Conditions: Area specific management directives must include measures to protect against detrimental edge effects to this species.

San Diego fairy shrimp (*Branchinecta sandiegonensis*)
Presence in the Park: Potentially present in vernal pools in the Park.
Habitat Preferred: Vernal pools.
Food: Nearly all species of fairy shrimp feed on algae, bacteria, protozoa, rotifers and bits of organic matter (Eng et al. 1990; Pennak 1989).
Breeding/Relevant Life History: The females carry their eggs in an oval or elongate ventral brood sac. The species hatches and matures within seven days to two weeks depending on water temperature (Hathaway and Simovich undated, Simovich and Hathaway undated). Shrimp eggs tend to hatch or germinate at cool temperatures, with species-specific differences in responses that are related to temperature regime. Lack of hatching at higher temperatures (greater than 77 degrees Fahrenheit) protects the San Diego fairy shrimp from the infrequent summer storms that might otherwise be sufficient to stimulate development, but inadequate for the organisms to complete their life cycles. The San Diego fairy shrimp disappear after about a month, but animals will continue to hatch if subsequent rains result in additional water or refilling of the vernal pools (Branchiopod Research Group 1996). The eggs are either dropped to the pool bottom or remain in the brood sac

until the female dies and sinks. The "resting" or "summer" eggs are capable of withstanding heat, cold and prolonged drying. When the pools refill in the same or subsequent rainy seasons, some but not all of the eggs may hatch. Fairy shrimp egg banks in the soil may be comprised of the eggs from several years of breeding (Donald 1983). Adult San Diego fairy shrimp are usually observed from January to March; however, in years with early or late rainfall, the hatching period may be extended.
Status/Predators: FE/MSCP covered species. Fairy shrimp are fed upon by waterfowl (Krapu 1974; Swanson et al. 1974) and other vertebrates, such as western spadefoot toad (*Scaphiopus hammondi*) tadpoles (Branchiopod Research Group 1996).
MSCP Conditions: Area specific management directives must include measures to protect against detrimental edge effects to this species.

Orange-throated whiptail (*Aspidoscelis hyperythra beldingi*)
Presence in the Park: This species was observed in several locations throughout the Park in 2004 (Figure 10; HELIX 2004).
Habitat Preferred: Coastal sage scrub, chaparral, and edges of riparian zones and washes from the coast up to 3,400 feet above sea level. California buckwheat is consistently found in habitats favored by this lizard.
Food: Feeds primarily on termites.
Breeding/Relevant Life History: From October through December only juvenile lizards are typically observed; although warm weather can brings adults out during the winter. Individuals generally emerge from winter hibernation in March/April. Hatchlings are usually observed in August/September.
Status/Predators: CSC/FSC/MSCP covered species. Vast areas of former habitat have been converted to urban and agricultural development.
MSCP Conditions: Area specific management directives must address edge effects.

San Diego horned lizard (*Phrynosoma coronatum blainvillei*)
Presence in the Park: The San Diego horned lizard was observed in the past, south of Osler Street and east of Inman Street (Figure 10; Dudek 2003a). Based on the habitats present, it is likely that this species also occurs elsewhere in the Park.
Habitat Preferred: Chaparral, coastal sage scrub and grasslands
Food: Harvester ants.
Breeding/Relevant Life History: Hibernates from September/October, generally emerges in late March, and is most active in April/May. Juveniles are found from July to September.
Status/Predators: FSC/CSC/MSCP covered species. Declining primarily due to habitat degradation and loss. Collection for pets is another cause of decline. The species relies on its coloration to blend into the environment as protection, rather than fleeing, when approached. This makes it more susceptible to capture by humans or other animal predators (e.g., domestic cats).
MSCP Conditions: Area specific management directives must include specific measures to maintain native ant species, discourage the Argentine ant and protect against detrimental edge effects to this species.

Southwestern pond turtle (*Clemmys marmorata pallida*)
Presence in the Park: Due to human encroachment, populations in the valleys and along the coast appear to be less stable than those away from urban sprawl. Therefore, this species has low potential to occur in the Park.

Habitat Preferred: This turtle lives where water persists throughout the year. The ponds are characterized by emergent and floating vegetation such as cattails and mats of algae.
Food: The pond turtle eats fish, insects, aquatic plants, worms and carrion. In coastal San Diego County, turtles sometimes eat introduced crayfish (which are present in the Park) (Holland 1991).
Breeding/Relevant Life History: Mating occurs April through May. Eggs are typically laid on dry, well-drained soils with significant clay-silt content and less than 15 degree slope. Three to 11 eggs are laid in a hole that is backfilled. Hatchlings spend the winter in the nest and emerge in March/April (Holland 1991).
Status/Predators: FSC/CSC/MSCP covered species. Predators include humans, and non-native fish and bullfrogs (*Rana catesbeiana*) are a significant issue for young turtles.
MSCP Conditions: Maintain and manage a 1,500-foot area around known locations within preserve lands for the species. Within this impact avoidance area, human impacts will be minimized, non-native species detrimental to pond turtles will be controlled/removed, and habitat restoration/enhancement measures will be implemented.

Least Bell's vireo (*Vireo bellii pusillus*)
Presence in the Park: This species was found adjacent to the SDG&E pipeline facility in the southern end of the Park in 1991 (CNDDB 2004). In 2004, this species was found just south of that location (Figure 10).
Habitat Preferred: Southern cottonwood-riparian woodland and southern willow scrub in southern California.
Food: In one study 99.3 percent of food was of bugs, grasshoppers, beetles and caterpillars predominating (Bent 1950 in Park and Recreation Department, City of San Diego and Merkel and Associates 2002).
Breeding: Birds arrive in mid-March to early April, and most vireo nesting activity occurs from April 10 to July 31. Most birds leave by September.
Nests/Incubation/Clutch Size: Nests are cup-shaped and constructed of leaves, bark, willow catkins, spider webs and other material (Bent 1950). The nest is typically constructed in the fork of a tree or shrub within three feet of the ground. Three to four eggs are typically laid. Incubation lasts approximately 14 days with another 10 to 12 days to fledging.
Call: A quick series of notes typically beginning with "cheedle cheedle" followed immediately by a rising "chee" then "cheedle cheedle" followed immediately by a descending "choo."
Status/Predators: FE/SE/MSCP covered species. This vireo is particularly susceptible to brood parasitism by the brown-headed cowbird.
MSCP Conditions: Area specific management directives must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to the species. Any clearing of occupied habitat must occur between September 15 and March 15.

Coastal California gnatcatcher (*Polioptila californica californica*)
Presence in the Park: This species was observed in many locations throughout the Park (HELIX 2004; Tierra 2004; Dudek 2003a and b; and Earth Tech 2003).
Habitat Preferred: Open Diegan coastal sage scrub and maritime succulent scrub predominated by California sagebrush and California buckwheat. May use adjacent habitats, particularly riparian habitats, when prey items may be less abundant.
Food: The gnatcatcher is an insectivore. Specific information on prey preferences is unavailable.

Breeding: The gnatcatcher is a year-round resident that breeds from approximately mid-February through July.
Nests/Incubation/Clutch Size: Nests are generally built within a few feet of the ground in the fork of a shrub. The nests are small and are built with soft plant material held together with spider webs. Four eggs are usually laid. Incubation lasts 14 to 16 days with fledging occurring approximately 16 days later.
Call: A kitten-like "mew."
Status/Predators: FT/CSC/MSCP covered species. Hawks and falcons prey upon the gnatcatcher, and other animals such as the striped whipsnake (*Masticophis lateralis*) and western scrub jay (*Aphelocoma californica*) may prey upon gnatcatcher eggs and nestlings.
MSCP Conditions: Area specific management directives must include measures to reduce edge effects and minimize disturbance during the nesting period, fire protection measures to reduce the potential for habitat degradation due to unplanned fire, and management measures to maintain or improve habitat quality including vegetation structure. No clearing of occupied habitat may occur between March 1 and August 15.

Cooper's hawk (*Accipiter cooperii*)
Presence in the Park: The Cooper's hawk has been observed throughout the Park (HELIX 2004; Tierra 2004; Dudek 2003a; and Tecolote Canyon CAC 1982).
Habitat Preferred: The Cooper's hawk tends to inhabit lowland riparian areas and oak woodlands in proximity to suitable foraging areas such as scrublands or fields.
Food: The Cooper's hawk feeds on songbirds and may also eat reptiles and amphibians.
Breeding: The breeding season is approximately March through June.
Nests/Incubation/Clutch Size: A substantial stick nest is typically placed in a crotch or near the main trunk of a tree. Four to five eggs are common. Incubation lasts 32 to 36 days with fledging occurring 27 to 34 days later.
Call: The Cooper's hawk vocalizes with a loud, repetitive "kek kek kek."
Status/Predators: CSC/MSCP covered species. Habitat destruction and nest site disturbance are leading to the decline of this species.
MSCP Conditions: Area specific management directives must include 300-foot impact avoidance areas around active nests and minimization of disturbance in oak woodlands and oak riparian forests.

Golden eagle (*Aquila chrysaetos*)
Presence in the Park: The golden eagle has been observed flying over the Park (Battle, pers. obs.).
Habitat Preferred: Forage in grassy and open, shrubby habitats. Nest most often on cliffs, less often in trees. Tend to require places of solitude and are usually found at a distance from human habitation.
Food: The golden eagle eats mostly rabbits, hares and rodents; it also takes other mammals, birds, reptiles, and some carrion (Olendorff 1976).
Breeding: The breeding season is approximately late January through August.
Nests/Incubation/Clutch Size: A large platform nest made of sticks, twigs and greenery is typically placed on cliffs of all heights and in large trees in open areas (Call 1978). The clutch size is typically two; however, one to three eggs can be laid (McGahan 1968). Incubation lasts 43 to 45 days (Beebe 1974) with fledging occurring 65 to 70 days later.
Call: The golden eagle is generally a quiet bird. Occasionally it utters a loud, clear yelping call and mewing cries in display.

Status/Predators: Nesting and wintering – CSC/MSCP covered species. Habitat destruction and nest site disturbance are leading to the decline of this species.
MSCP Conditions: Area specific management directives for areas with nest sites must include measures to avoid human disturbance while the nest is active, including establishing a 4,000-foot disturbance avoidance area within preserve lands. Area specific management directives must also include monitoring of nest sites to determine use/success.

Northern harrier (*Circus cyaneus*)
Presence in the Park: This species was observed in the Park in 2003 (Dudek 2003a).
Habitat Preferred: Salt marshes, grasslands, and coastal sage scrub habitats are used by the northern harrier.
Food: The species eats small vertebrates including birds, rodents, snakes, frogs, large insects and carrion.
Breeding: This species' breeding season is from approximately March through June.
Nests/Incubation/Clutch Size: Nests are typically placed on or near the ground on grassy material in thick vegetation or tall grass. Four to nine eggs (five are typical) are laid. Incubation lasts 31 to 32 days with fledging occurring 30 to 35 days later (Ehrlich et al. 1988 in Park and Recreation Department, City of San Diego and Merkel and Associates 2002).
Call: Calls are not commonly heard but may include a "kee kee kee" sound or sharp whistles while on the nest.
Status/Predators: CSC/MSCP covered species. Development is removing broad tracts of open terrain used by the harrier, and the harrier is unlikely to nest near areas of human activity.
MSCP Conditions: Area specific management directives must manage agricultural and disturbed lands within four miles of nesting habitat to provide foraging habitat and include an impact avoidance area (900 foot or maximum possible within the MHPA) around active nests. The preserve management coordination group shall coordinate efforts to manage for wintering northern harrier foraging habitat within the MHPA.

Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
Presence in the Park: This species was observed in the Park in 2003 (Dudek 2003a; Earth Tech 2003).
Habitat Preferred: The species' preference is for open, low-growing sage scrub habitat, often in rocky terrain and on steep slopes.
Food: This sparrow eats seeds, young grass shoots, and insects.
Breeding: The rufous-crowned sparrow is a year-round resident that breeds from early March through June.
Nests/Incubation/Clutch Size: Nests typically are found in shallow depressions flush with the ground surface or occasionally in low-growing shrubs. The nests are made with grass and twigs and lined with finer materials. Two to five eggs are laid and incubated for 11 to 13 days with fledging occurring eight to nine days later.
Call: The calls are a distinctive "doo doo doo doo doo doo."
Status/Predators: FSC/CSC/MSCP covered species. The bird has become more locally restricted due to the conversion of coastal sage scrub habitat to urban and agricultural development. This species' ground nest is an easy target for reptilian, avian and mammalian predators.
MSCP Conditions: Area specific management directives must include maintenance of dynamic processes, such as fire, to perpetuate some open phases of coastal sage scrub with herbaceous components.

Southwestern willow flycatcher (*Empidonax traillii extimus*)

Presence in the Park: This species was not detected in the Park; however, no focused surveys for it were conducted. It has not been reported to the CNDDB for the La Jolla quad in which Tecolote Canyon occurs; however, the southern riparian forest vegetation in the Park could be appropriate for the species.

Habitat Preferred: The southwestern willow flycatcher breeds in dense riparian habitats along rivers, streams or other wetlands. The vegetation can be dominated by dense growths of willows, mule fat or other shrubs and medium-sized trees. There may be an overstory of cottonwood, tamarisk or other large trees, but this is not always the case. One of the most important characteristics of the habitat appears to be the presence of dense vegetation, usually throughout all vegetation layers present. Almost all flycatcher breeding habitats are within close proximity (less than 20 yards) to water or very saturated soil. This water may be in the form of large rivers, smaller streams, springs or marshes. At some sites, surface water is present early in the nesting season, but gradually dries up as the season progresses. Ultimately, the breeding site must have a water table high enough to support riparian vegetation (USGS, Southwest Biological Science Center 2005).

Food: This species is primarily an insectivore. Little information is available on its prey preferences.

Breeding: Migrants arrive from early May to mid June. Breeding occurs from mid May through August. Fall migrants return as early as the beginning of August and usually leave by mid September.

Nests/Incubation/Clutch Size: Southwestern willow flycatchers build cup nests typically placed in the fork of a branch with the nest cup supported by smaller stems at heights of approximately 13 to 23 feet (Federal Register 1993 in Park and Recreation Department, City of San Diego and Merkel and Associates 2002). Egg laying usually begins in early to mid June, and clutch size is usually three to four eggs for first nests. Second, or even third, clutches are possible if previous nests fail (Sferra et al. 1997 and Whitfield, pers. comm. in Sogge et al. 1997). Incubation lasts for 12 to 13 days with young in the nest for another 12 to 14 days.

Call: Described as sounding like "fitz-bew."

Status/Predators: FE/MSCP covered species. The most significant factor in the decline of the southwestern willow flycatcher is the loss, fragmentation and alteration of riparian breeding habitat (Sogge et al. 1997). Brown-headed cowbird (*Molothrus ater*) brood parasitism is another significant threat.

MSCP Conditions: Area specific management directives must include measures to provide appropriate successional habitat, upland buffers for all known populations, cowbird control, and specific measures to protect against detrimental edge effects to the species. Any clearing of occupied habitat must occur between September 1 and May 1.

Table 6
SENSITIVE ANIMAL SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN TECOLOTE CANYON FOR WHICH NO SPECIFIC MSCP MANAGEMENT DIRECTIVES HAVE BEEN ADOPTED

Subarea Plant Status: *CS=MSCP Covered; NC=Not MSCP Covered; NE=Not Eval.*

Subarea Plan Status	*Scientific Name* Common Name	Status*	TCNP NRMP Area Notes
		Invertebrates	
NC	*Lycaena hermes* **Hermes copper**	FSC/--	Current range for the species is east of Interstate 15. Low potential to occur in the Park.
		Amphibians	
NE	*Scaphiopus hammondii* **Western spadefoot**	--/CSC	May be found in coastal sage scrub, chaparral and grasslands habitats but is most common in grasslands with vernal pools. Requires pools with water temperatures between 9° and 30°C in which to reproduce (Brown 1966 and 1967) and that persist with more than three weeks of standing water (Feaver 1971). Additionally, Holland and Goodman (1998) report that riparian habitats with suitable water resources may also be utilized. All pools must lack fish, bullfrogs and crayfish in order for this species to successfully reproduce and metamorphose (Jennings and Hayes 1994). This species has low potential to occur in the Park since crayfish are present.
		Reptiles	
NE	*Salvadora hexalepis virgultea* **Coast patch-nosed snake**	--/CSC	Occurs in desert scrub, coastal chaparral, washes, sandy flats and rocky areas. It is a generalist in its diet and probably preys on anything it can overpower including small mammals (*Dipodomys*), lizards (*Cnemidophorus, Coleonyx*) and the eggs of lizards and snakes (Stebbins 1954). It is potentially present in the Park.
NE	*Lichanura trivirgata roseofusca* **Coastal rosy boa**	--/CSC	According to Zeiner et al. (1988) the rosy boa occurs in rocky chaparral-covered hillsides in coastal areas and in canyons. Holland and Goodman (1998) add that it is known from a variety of desert and semi-desert habitats, but it is absent from grasslands. It may occur in oak woodlands if they intermix with scrub or chaparral habitats. Within these habitats, it appears to prefer moderate to dense vegetative cover with rocks (Stebbins 1985; Zeiner et al. 1988; Holland and Goodman 1998). It is potentially present in the Park.
NE	*Eumeces skiltonianus interparietalis* **Coronado skink**	--/CSC	Occurs in a variety of habitats ranging from coastal sage, chaparral, oak woodlands, pinon-juniper and riparian woodlands to pine forests (Stebbins 1985), but within these associations it is often restricted to the more mesic pockets (Zeiner et al. 1988). It is potentially present in the Park.
NE	*Crotalus exsul* **Red diamond rattlesnake**	--/CSC	The species is most commonly associated with heavy brush with large rocks or boulders (Klauber 1972). It has been seen in the Park for several years, but is potentially still present (Viator, pers. comm.).

Table 6 (cont.)
SENSITIVE ANIMAL SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN TECOLOTE CANYON FOR WHICH NO SPECIFIC MSCP MANAGEMENT DIRECTIVES HAVE BEEN ADOPTED

Subarea Plan Status	*Scientific Name* Common Name	Status*	TCNP NRMP Area Notes
			Reptiles (cont.)
NE	*Anniella nigra argentea* Silvery legless lizard	--/CSC	Found primarily in areas with friable soils, some moisture content and some vegetative cover with leaf litter. It has been observed in the Park (Battle, pers. comm.).
NE	*Thamnophis hammondii* Two-striped garter snake	--/CSC	This species is one of the most aquatic and is typically associated with wetland habitats such as streams, creeks and pools (Fitch 1940; Rossman et al. 1996). It is closely associated with streams with rocky beds and bordered by willows (Stebbins 1985); also ponds, lakes, wetlands and vernal pools. It also occurs in mixed oak, oak woodlands and chaparral on coastal slopes of mountains and foothills to sea level. It is potentially present in the Park.
CS	*Falco peregrinus anatum* American peregrine falcon	--/SE	A pair of peregrine falcons was observed perched on two large, metal power line towers to the east of Tecolote Canyon Golf Course (Figure 10; HELIX 2004). Until 1950, only a few pairs nested in San Diego County. Three nest sites occur outside the MHPA (City 1997). This species is primarily a rare fall and winter visitor, mostly along the coast where it feeds on waterfowl. It uses grasslands and scrublands, cliffs, steep terrain and sometimes urban areas. It is often found along the coast or near lagoons and ponds where waterfowl gather. Tecolote Canyon is most likely a foraging area for the species.
NE	*Amphispiza belli belli* Bell's sage sparrow	FSC/CSC	An uncommon to fairly common but localized resident breeder in dry chaparral and coastal sage scrub along the coastal lowlands, inland valleys and in the lower foothills of local mountains. This species is potentially present in the Park.
CS	*Buteo regalis* Ferruginous hawk	FSC/CSC	An occupant of open dry country requiring large, open tracts of grasslands, sparse shrub or desert habitats with elevated structures for nesting. Its wintering habitat is similar in being open and it may also occur in areas of mixed grassy glades and pineries (Brown and Amadon 1968). This species has low potential to occur in the Park.
NC	*Ammodramus savannarum* Grasshopper sparrow	--/--	In California, breed (and primarily apparently winter) on slopes and mesas containing grasslands of varying compositions (Grinnell and Miller 1944; Garrett and Dunn 1981). The species frequents dense, dry or well-drained (especially native) grassland with a mix of grasses and forbs for foraging and nesting. Apparently, thick cover of grasses and forbs is essential for concealment. They especially occur in grasslands composed of a variety of grasses and tall forbs with scattered shrubs for singing perches (Zeiner et al. 1990a). This species has low potential to occur in the Park.

Table 6 (cont.)
SENSITIVE ANIMAL SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN TECOLOTE CANYON FOR WHICH NO SPECIFIC MSCP MANAGEMENT DIRECTIVES HAVE BEEN ADOPTED

Subarea Plan Status	*Scientific Name* Common Name	Status*	TCNP NRMP Area Notes
		Birds	
NE	*Lanius ludovicianus* **Loggerhead shrike**	FSC/CSC	Known to forage over open ground within areas of short vegetation, pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, riparian areas, open woodland, agricultural fields, desert washes, desert scrub, grassland, broken chaparral and beach with scattered shrubs (Unitt 1984; Yosef 1996). Individuals like to perch on posts, utility lines and often use the edges of denser habitats (Zeiner et al. 1990a). This species was observed in the Park (HELIX 2004).
NE	*Falco mexicanus* **Prairie falcon**	--/CSC	Habitat includes annual and perennial grasslands, savannahs, rangeland, some agricultural fields and scrub areas where there are cliffs or bluffs for nest sites (Brown and Amadon 1968). The species was documented in the Park in the 1982 Master Plan (Tecolote Canyon CAC 1982).
NE	*Accipiter striatus* **Sharp-shinned hawk**	--/CSC	Breeds in young coniferous forests. For hunting habitat, it often uses openings at the edges of woodlands. Sharp-shinned hawks are most common in southern California in the coastal lowlands and desert areas in winter and may occur in a large variety of woodland habitats during winter and migration periods (Garrett and Dunn 1981). The sharp-shinned hawk was observed in 2003 (Dudek 2003a).
CS	*Sialia mexicana* **Western bluebird**	--/--	Common in coniferous and oak woodland in the inland valleys, foothills and mountains of San Diego County. According to the San Diego Natural History Museum, it occurs near the coast only in Camp Pendleton (San Diego Natural History Museum, undated), although it has been observed on the UCSD campus (D. Leonard, pers. obs. 2001). It is attracted to mistletoe and nests in tree cavities (San Diego Natural History Museum, undated). This species is potentially present in the Park.
NE	*Elanus leucurus* **White-tailed kite**	--/Fully protected	Inhabits low elevation, open grasslands, savannah-like habitats, agricultural areas, wetlands and oak woodlands. Riparian areas adjacent to open areas are also used (Dunk 1995). Uses trees with dense canopies for cover and the specific plant associations seem to be unimportant with the vegetation structure and prey abundance apparently more important (Dunk 1995). The species was documented in the Park in the 1982 Master Plan (Tecolote Canyon CAC 1982).

Table 6 (cont.)
SENSITIVE ANIMAL SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN TECOLOTE CANYON FOR WHICH NO SPECIFIC MSCP MANAGEMENT DIRECTIVES HAVE BEEN ADOPTED

Subarea Plan Status	*Scientific Name* Common Name	Status*	TCNP NRMP Area Notes
		Birds (cont.)	
NE	*Icteria virens* Yellow-breasted chat	--/CSC	Observed south of the SDG&E pipeline facility in the southern end of the Park in 2004 (Figure 10; HELIX 2004). It occurs in most of North America and breeds in southern California during the spring and summer. It uses tangles, briars, stream thickets, riparian scrub and riparian woodland, but breeding is confined to riparian woodlands.
NE	*Dendroica petechia brewsteri* Yellow warbler	--/CSC	Heard in disturbed riparian forest on the Tecolote Canyon Golf Course in 2004 (Figure 10; HELIX 2004). It occurs throughout North America and is a spring and summer breeding resident in southern California. It occurs in riparian areas throughout California but is primarily restricted to riparian woodland and riparian scrub habitats in southern California.
		Mammals	
NC	*Eumops perotis californicus* California mastiff bat	--/CSC	Occurs in open semi-arid to arid habitats such as deciduous woodlands, coastal scrub, grasslands, chaparral and urban environments. It prefers extensive open areas with abundant roost locations such as crevices in rock outcrops and buildings (Zeiner et al. 1990b). This species is potentially present in the Park.
NE	*Chaetodipus californicus femoralis* Dulzura California pocket mouse	FSC/CSC	Inhabits such habitats as coastal scrub, chaparral and grassland and is probably attracted to the grass-chaparral edge (Zeiner et al. 1990b). This species is potentially present in the Park.
NE	*Chaetodipus fallax fallax* Northwestern San Diego pocket mouse	--/CSC	Inhabits coastal sage scrub, sage scrub/grassland ecotones and chaparral communities. It generally exhibits a strong affinity for moderately gravelly and rocky substrates (Bleich 1973; Price and Waser 1984) and to a lesser extent shrubby areas (Metropolitan Water District and Riverside County Habitat Conservation Agency 1995). This species is potentially present in the Park.
NC	*Perognathus longimembris pacificus* Pacific pocket mouse	FE/CSC	Found on fine-grained, sandy or gravelly substrates in coastal strand, coastal dunes, river alluvium and coastal sage scrub growing on marine terraces within approximately 2.4 miles inland of the Pacific Ocean. Only three populations are known to be extant today: one at the Dana Point Headlands in Orange County and two on Camp Pendleton in San Diego County (Erickson 1993). This species has low potential to occur in the Park.

Table 6 (cont.)
SENSITIVE ANIMAL SPECIES KNOWN OR WITH POTENTIAL TO OCCUR IN TECOLOTE CANYON FOR WHICH NO SPECIFIC MSCP MANAGEMENT DIRECTIVES HAVE BEEN ADOPTED

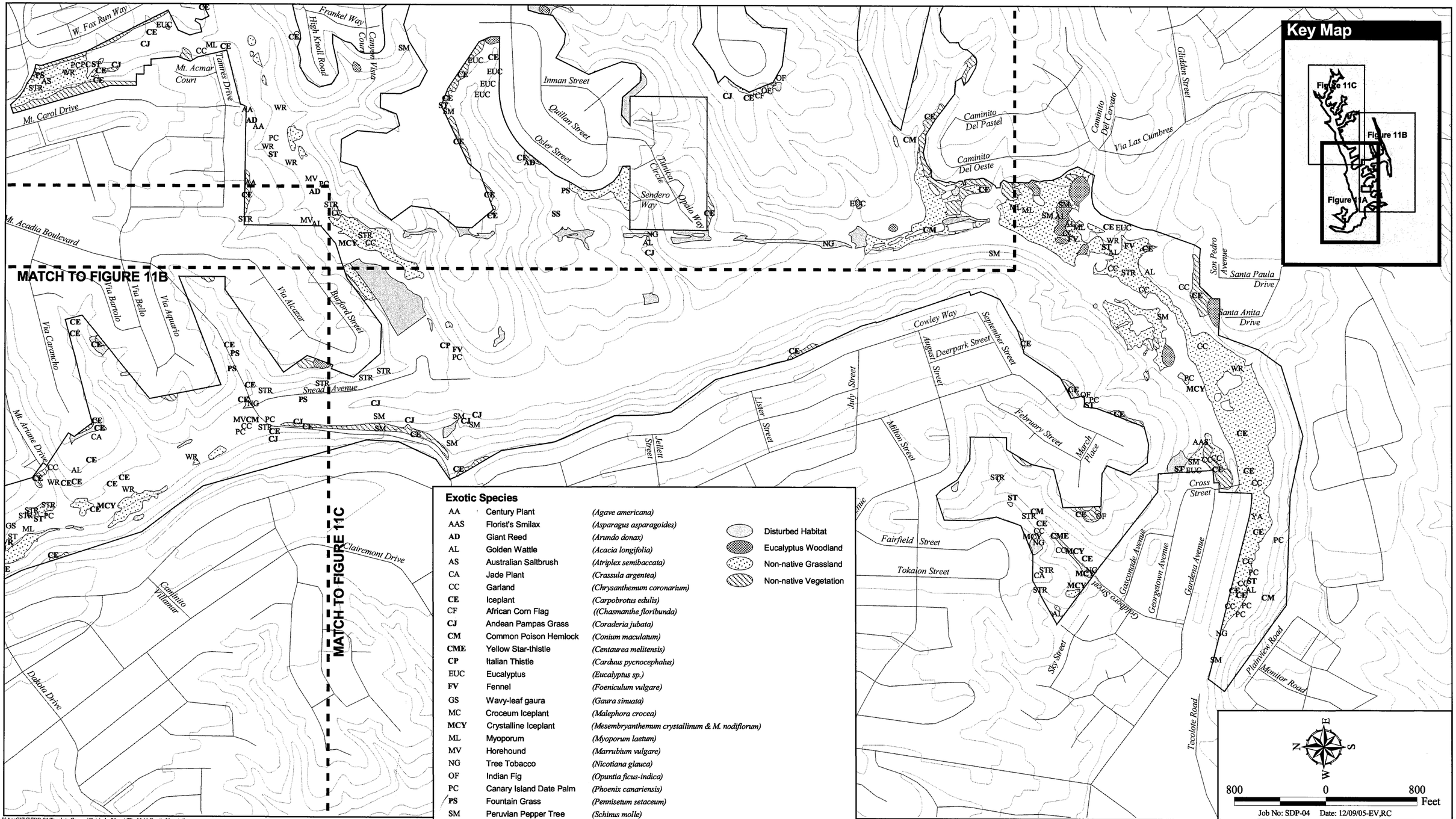
Subarea Plan Status	*Scientific Name* Common Name	Status*	TCNP NRMP Area Notes
Mammals (cont.)			
NE	*Atrozous pallidus* **Pallid bat**	--/CSC	Occupies grasslands, shrublands, woodlands and forests. It prefers rocky outcrops, cliffs and crevices with access to open habitats for foraging (Zeiner et al. 1990b). This species is potentially present in the Park.
NE	*Lepus californicus bennettii* **San Diego black-tailed jackrabbit**	FSC/CSC	In 2004, San Diego black-tailed jackrabbit scat was observed in the northern portion of the Park (HELIX 2004). It occurs from southern Santa Barbara County, south on the coastal slope to the vicinity of San Quintin, Baja California, Mexico. Localities on the eastern edge of its range include Jacumba and San Felipe Valley in San Diego County. It occurs primarily in open habitats including coastal sage scrub, chaparral, grasslands, croplands, and open, disturbed areas if there is at least some shrub cover present. Based on the habitats present, it is likely that this species also occurs elsewhere in the Park.
NE	*Neotoma lepida intermedia* **San Diego desert woodrat**	--/CSC	Desert woodrats are found in a variety of shrub and desert habitats primarily associated with rock outcroppings, boulders, cacti or areas of dense undergrowth. Woodrat nests were observed in the Park but could belong to the dusky-footed woodrat (*Neotoma fuscipes*). The San Diego desert woodrat is potentially present in the Park.

*A listing and explanation of status codes are provided at the end of Appendix A.

Non-native Species

"Non-native plant invasions can have a variety of effects on wildlands, including alteration of ecosystem processes; displacement of native species; [and] support of non-native animals, fungi, or microbes" (Bossard et al. 2000). Ecosystem processes that can be affected by non-native species include nutrient cycling, fire frequency and intensity, hydrologic cycles, sediment deposition, and erosion (Bossard et al. 2000).

Approximately 146 of the 335 (44 percent) plant species that have been identified in the Park are non-native. Figures 11A through 11C, *Exotic Vegetation*, show non-native vegetation communities and mapped locations of individual non-native, invasive plants. According to the California Invasive Plant Council (CalIPC), 15 of these species are considered exotic pest plants of great ecological concern (CalIPC 1999). Six of these species are on CalIPC's List A, which includes the most invasive wildland pest plants that are aggressive invaders that displace native species and disrupt natural habitats. List



Exotic Species

AA	Century Plant	*(Agave americana)*
AAS	Florist's Smilax	*(Asparagus asparagoides)*
AD	Giant Reed	*(Arundo donax)*
AL	Golden Wattle	*(Acacia longifolia)*
AS	Australian Saltbrush	*(Atriplex semibaccata)*
CA	Jade Plant	*(Crassula argentea)*
CC	Garland	*(Chrysanthemum coronarium)*
CE	Iceplant	*(Carpobrotus edulis)*
CF	African Corn Flag	*((Chasmanthe floribunda)*
CJ	Andean Pampas Grass	*(Coraderia jubata)*
CM	Common Poison Hemlock	*(Conium maculatum)*
CME	Yellow Star-thistle	*(Centaurea melitensis)*
CP	Italian Thistle	*(Carduus pycnocephalus)*
EUC	Eucalyptus	*(Eucalyptus sp.)*
FV	Fennel	*(Foeniculum vulgare)*
GS	Wavy-leaf gaura	*(Gaura sinuata)*
MC	Croceum Iceplant	*(Malephora crocea)*
MCY	Crystalline Iceplant	*(Mesembryanthemum crystallinum & M. nodiflorum)*
ML	Myoporum	*(Myoporum laetum)*
MV	Horehound	*(Marrubium vulgare)*
NG	Tree Tobacco	*(Nicotiana glauca)*
OF	Indian Fig	*(Opuntia ficus-indica)*
PC	Canary Island Date Palm	*(Phoenix canariensis)*
PS	Fountain Grass	*(Pennisetum setaceum)*
SM	Peruvian Pepper Tree	*(Schimus molle)*
SS	St. Augustine Grass	*(Stenotaphrum secundatum)*
ST	Brazilian Pepper Tree	*(Schimus terebinthifolius)*
STR	Tumbleweed	*(Salsola tragus)*
YA	Spanish Bayonet	*(Yucca aloifolia)*

Note: Bold symbols indicate exotic pest plants of great ecological concern.

Disturbed Habitat
Eucalyptus Woodland
Non-native Grassland
Non-native Vegetation

I:\ArcGIS\SSDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig 11A) Exotic Vegetation

Exotic Vegetation

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 11A

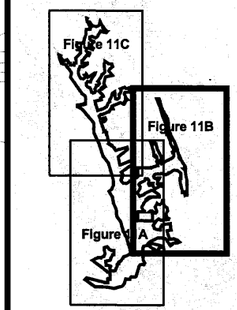
Exotic Species

AA	Century Plant	*(Agave americana)*
AD	Giant Reed	*(Arundo donax)*
AF	Hollow-stem Asphodle	*(Asphodelus fistulosus)*
AL	Golden Wattle	*(Acacia longifolia)*
AS	Australian Saltbrush	*(Atriplex semibaccata)*
BR	Mustard	*(Brassica sp.)*
BS	Bougainvillea	*(Bougainvillea spectabilis)*
CA	Jade Plant	*(Crassula argentea)*
CC	Garland	*(Chrysanthemum coronarium)*
CE	Iceplant	*(Carpobrotus edulis)*
CF	African Corn Flag	*(Chasmanthe floribunda)*
CJ	Andean Pampas Grass	*(Coraderia jubata)*
CM	Common Poison Hemlock	*(Conium maculatum)*
CME	Yellow Star-thistle	*(Centaurea melitensis)*
EUC	Eucalyptus	*(Eucalyptus sp.)*
FV	Fennel	*(Foeniculum vulgare)*
GE	Cranesbill	*(Geranium sp.)*
MC	Croceum Iceplant	*(Malephora crocea)*
MCY	Crystalline Iceplant	*(Mesembryanthemum crystallinum & M. nodiflorum)*
ML	Myoporum	*(Myoporum laetum)*
MV	Horehound	*(Marrubium vulgare)*
NG	Tree Tobacco	*(Nicotiana glauca)*
OF	Indian Fig	*(Opuntia ficus-indica)*
PC	Canary Island Date Palm	*(Phoenix canariensis)*
PS	Fountain Grass	*(Pennisetum setaceum)*
RI	Idaho Locust	*(Robinia idahoensis)*
SM	Peruvian Pepper Tree	*(Schinus molle)*
SS	St. Augustine Grass	*(Stenotaphrum secundatum)*
ST	Brazilian Pepper Tree	*(Schinus terebinthifolius)*
STR	Tumbleweed	*(Salsola tragus)*
WR	Mexican Fan Palm	*(Washingtonia robusta)*

Note: Bold symbols indicate exotic pest plants of great ecological concern.

Disturbed Habitat
Eucalyptus Woodland
Non-native Grassland
Non-native Vegetation

Key Map



MATCH TO FIGURE 11A

MATCH TO FIGURE 11C

Ulric Street
Comstock Street
Langmuir Street
Preece Street
Genesee Avenue
Old Bridgeport Way
Mt. Alvarez Avenue
Boyd Avenue
Mt. Acara Drive
W. Fox Run Way
Mt. Acmar Court
Tamres Drive
Acworth Avenue
Mt. Carol Drive
Mt. Acadia Boulevard
Mt. Blanca Drive
Marlesta Drive
Freeway Drive
Conly Street
Frankel Way
High Knoll Road
Canyon Vista Court
Inman Street
Quillan Street
Osler Street
Tunica Circle
Sendero Way
Opalo Way
Manning Street
Lanston Street
Clifford Way
Kelly Street
Caminito Del Pastel

800 0 800 Feet

Job No: SDP-04 Date: 12/09/05-EV,RC

I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig 11A) Exotic Vegetation

Exotic Vegetation

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 11B

Exotic Species

AA	Century Plant	*(Agave americana)*
AAS	Florist's Smilax	*(Asparagus asparagoides)*
AD	Giant Reed	*(Arundo donax)*
AF	Hollow-stem Asphodle	*(Asphodelus fistulosus)*
AL	Golden Wattle	*(Acacia longifolia)*
AS	Australian Saltbrush	*(Atriplex semibaccata)*
BR	Mustard	*(Brassica sp.)*
CA	Jade Plant	*(Crassula argentea)*
CC	Garland	*(Chrysanthemum coronarium)*
CE	Iceplant	*(Carpobrotus edulis)*
CJ	Andean Pampas Grass	*(Coraderia jubata)*
CM	Common Poison Hemlock	*(Conium maculatum)*
CME	Yellow Star-thistle	*(Centaurea melitensis)*
CP	Italian Thistle	*(Carduus pycnocephalus)*
DS	Fuller's Teaseal	*(Dipsacus sativus)*
EA	Cherry of the Rio Grand	*(Eugenia aggregata)*
EC	Veldt Grass	*(Ehrharta calycina)*
EUC	Eucalyptus	*(Eucalyptus sp.)*
FI	Fig	*(Ficus sp.)*
FU	Shamel Ash	*(Fraxinus uhdei)*
FV	Fennel	*(Foeniculum vulgare)*
GS	Wavy-leaf Gaura	*(Gaura sinuata)*
HH	English Ivy	*(Hedera helix)*
MC	Croceum Iceplant	*(Malephora crocea)*
MCY	Crystalline Iceplant	*(Mesembryanthemum crystallinum & M. nodiflorum)*
ML	Myoporum	*(Myoporum laetum)*
MV	Horehound	*(Marrubium vulgare)*
NG	Tree Tobacco	*(Nicotiana glauca)*
OE	Olive	*(Olea europea)*
OF	Indian Fig	*(Opuntia ficus-indica)*
PC	Canary Island Date Palm	*(Phoenix canariensis)*
PE	Bristly Ox-tongue	*(Picris echioides)*
PS	Fountain Grass	*(Pennisetum setaceum)*
RI	Idaho Locust	*(Robinia idahoensis)*
ST	Brazilian Pepper Tree	*(Schinus terebinthifolius)*
STR	Tumbleweed	*(Salsola tragus)*
WR	Mexican Fan Palm	*(Washingtonia robusta)*
YA	Spanish Bayonet	*(Yucca aloifolia)*

Disturbed Habitat
Eucalyptus Woodland
Non-native Grassland
Non-native Vegetation

Note: Bold symbols indicate exotic pest plants of great ecological concern.

MATCH TO FIGURE 11B

MATCH TO FIGURE 11A

Key Map
Figure 11C
Figure 11B
Figure 11A

800 0 800 Feet

Job No: SDP-04 Date: 12/09/05-EV,RC

I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig 11C) Exotic Vegetation

Exotic Vegetation

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 11C

A species found in the Park include fountain grass (*Pennisetum setaceum*), fennel (*Foeniculum vulgare*), giant reed (*Arundo donax*), hottentot fig (*Carpobrotus edulis*), pampas grass (*Cortaderia jubata*) and veldt grass (*Ehrharta calycina*). Nine of these species are on CalIPC's List B, which includes wildland pest plants of lesser invasiveness that spread less rapidly and cause a lesser degree of habitat disruption. List B species found in the Park include castor bean (*Ricinus communis*), Brazilian pepper, crystalline iceplant, Italian thistle, mustard, olive (*Olea europaea*), Peruvian pepper, poison hemlock (*Conium maculatum*) and yellow star-thistle.

Of the approximately 150 species of animals documented in the Park, 8 are non-native. Two types of these – brown-headed cowbird and African clawed frog – are of particular management concern. The brown-headed cowbird spread from its original home in the Great Plains as lands were converted into farms and pastures. It has been recorded as a nest parasite of more than 200 other species. Cowbird eggs do not closely mimic host eggs nor do the cowbird young remove host eggs and host young from the nest. Cowbirds do tend to hatch earlier than their hosts, grow faster and crowd out or at least reduce the food intake of the host's young. Cowbird parasitism, therefore, affects the reproductive success of other bird species. African clawed frogs were first observed in the Park about 15 years ago and now are present throughout Tecolote Creek (Battle, pers. comm.). This species is native to Africa south of the Sahara Desert and has been introduced as released and escaped pets or scientific specimens. They prefer warm, stagnant pools and quiet streams, thriving in temperatures between 60 and 80 degrees Fahrenheit. Their diet and life history characteristics make them a threat to native species in the waterways into which they are introduced. They reportedly have a voracious appetite, eating living, dead or dying arthropods, aquatic insect larvae, water insects, crustaceans, small fish, tadpoles, worms and freshwater snails. The frogs are sexually mature in 10 to 12 months, and females lay 2,000 to 8,000 eggs per year. They live up to 15 years (Smithsonian National Zoological Park 2004). These frogs are impacting native amphibian populations in the Park.

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3.4 Cultural Resources

The archaeological study for the TCNP NRMP included a records search (conducted at the South Coastal Information Center at San Diego State University) and literature review of the Park and the immediate vicinity, a brief review of historic maps and archival material, and consultation with individuals knowledgeable about the Park's resources (Appendix D). While two small archaeological surveys have been performed within the Park, no comprehensive archaeological survey has ever been undertaken.

Regional Chronology

A brief history of San Diego County is presented for the purpose of providing a foundation for discussion on the presence, chronological significance and historical relationship of cultural resources within the Park.

The earliest accepted archaeological manifestation of Native Americans in the San Diego County area is the San Dieguito complex, dating to approximately 10,000 years ago (Warren 1967). According to the traditional view of San Diego prehistory, the San Dieguito complex was followed by the La Jolla complex at least 7,000 years ago, possibly as long as 9,000 years ago (Rogers 1966). This chronology has, however, been disputed by archaeologists in the region in recent years, with some suggesting that the differences in artifact assemblages between sites reflect functional differences rather than temporal or cultural variability (Bull 1987; Gallegos 1987).

In the southern portion of San Diego County, the late Prehistoric period is represented by the Cuyamaca complex. This complex represents the Yuman forebears of the Kumeyaay (Diegueño, named for the San Diego Mission). They were primarily hunters and gatherers, eating rabbit, acorn and grass seed. To encourage larger seeds and attract animals for hunting, they burned the grasslands and hillsides. Regular, seasonal travels took them from the coast to the mountains and even to the desert to gather fresh food (Christenson 1994). In this complex, fewer projectile points and a greater number of scrapers and scraper planes are found at coastal sites (Robbins-Wade 1986, 1988). These people emphasized the use of ceramics, with a wide range of forms and several specialized items. They also established defined cemeteries away from living areas, used grave markers, cremated their dead and placed them in urns, and used specially made mortuary offerings (True 1970). It is the descendants of these people who the first Europeans encountered when they founded the Mission San Diego de Alcala in 1769.

The period from 1769 to 1821 was characterized by exploration; establishment of the San Diego Presidio and the San Diego and San Luis Rey missions; and the introduction of horses, cattle and agricultural goods. Cattle ranching prevailed over agricultural activities and the development of the hide and tallow trade increased during the 1820s and 1830s. Although several land grants were made prior to secularization of the San Diego Mission de Alcala in 1834, vast tracts of land were dispersed through land grants after secularization. When Mexico ceded California to the United States under the Treaty of Guadalupe Hidalgo, ending the Mexican-American War in 1848, much of the land that once constituted the Mexican rancho holdings became available for settlement by emigrants to California. The influx of people to California and the San Diego region was the result of various factors, including the discovery of gold in the state; conclusion of the Civil War; availability of free land through passage of the Homestead Act; and importance of the county as an agricultural area supported by the construction of connecting railways. The growth and decline of towns occurred in response to an increased population and the economic "boom and bust" in the late 1800s.

Local Chronology

The Park is within lands that were once inhabited by the Kumeyaay Indians, also known as Diegueño or Ipai/Tipai (Luomala 1978). Recorded sites associated with these people include two ethnohistoric village sites (*Cosoy* or *Kosoi*, and *Nipaquay*) associated with Mission San Diego de Alcala in Mission Valley (Carrico 1993) and two "old rancheria" sites in the Old Town area. These rancherias may represent portions of the ethnohistoric village of *Cosoy*. In addition, the ethnohistoric village *La Rinconada de Jamo* was located in the area that is now I-5 and Garnet Avenue (Carrico 1977; Winterrowd and Cárdenas 1987). The Park is in proximity to all of these habitation sites. Around 1900, many Kumeyaay continued to live around the edge of Mission Bay and throughout Mission Valley (Shipek 1970).

Records research indicates that Tecolote Canyon (particularly its southern portion) and its immediate vicinity supported small family farms/homesteads, ranches and market gardens for decades. Judge Hyde was noted as one of the first settlers in Tecolote Canyon in an 1872 newspaper article. Roberta Fish recalled that her father built a house and five windmills on the 40 acres they owned in the Canyon in the 1880s (Davidson 1936). Based on a survey in 1901, structures occurred in three locations within the Park and one location just outside of it. These structures, as well as a ranch complex just outside of the Park, appear in a 1928 aerial photograph.

A small farming community was located at the mouth of the Canyon by 1930 and included a dairy farm owned by Mr. Ambort, a chicken farm owned by the Pena family and a tomato farm owned by Peter Sampo. Lima beans and pigs also were raised in the Canyon (Kosits undated) and the Romo family ran cattle and did some truck farming (Battle, pers. comm.). Based on mapping done in 1939, three structures occurred in the Park and structures at one of the 1901 locations were shown as ruins. Manuel Pena ran a chicken ranch in the Canyon that supplied the military during World War II (Williams 2004). Dr. Isham and his family lived on one of the last farms in the Canyon (Kosits undated). Their farmhouse is still standing at the end of Gardena Avenue, just outside of the Park (Battle, pers. comm.). Only one structure occurred in the Park in 1950, in the area of a house that was present in 1901, 1928 and 1939. As late as 1953, cattle were still grazing in the Canyon, and startled residents sometimes found mounted cowboys herding strays out of the backyards of their rim-side homes (Tecolote Canyon CAC 1982).

Known Cultural Resources

No comprehensive archaeological survey of the Park has been performed. Two small archaeological surveys have been completed: one in 1986 within several areas proposed for improvements by the City (Hector 1986), and the other within the SDG&E easement, just south of the Tecolote Canyon Golf Course, for the proposed placement of a fiber optic line (Holson 2001). A single archaeological site (CA-SDI-11,021) was recorded during the 1986 survey and was described as a shell scatter in two concentrated areas. Given the lack of other cultural material (i.e., artifacts) and the proximity of fossil beds, it was noted that the site may not be cultural, but rather fossil shell. There is no record of testing at this site; however, Hector recommended that no disturbance occur in the site area.

A prehistoric archaeological site within the Park found by amateur archaeologist Richard Cerutti contains remnant hearth features, ground stone implements and flaked stone artifacts made from the local cobbles. Mr. Cerutti suggested that the site is representative of the La Jolla complex.

A large historic trash dump is located within the Park. This site, locally known as the Medina Site, was named after Fernando Medina, a local high school student and Tecolote Canyon volunteer who discovered and studied the site. Former Senior Ranger Tracey Walker determined that some materials in the dump dated as far back as 1870. The dump includes restaurant debris, medicine bottles and at least one artifact from the Panama-California Exposition held in Balboa Park in 1915. Debris apparently was discarded in the drainage alongside a road until the 1960s (La Rue 1997). Mr. Cerutti indicated that members of the San Diego Bottle Club are aware of other "bottle dumps" throughout the Canyon.

Other visible remnants of the historic use of the Canyon include fruit, pepper and eucalyptus trees and other landscape plants throughout the Canyon. In particular, a row of large eucalyptus trees probably was a windbreak for an early homestead.

In addition to these known resources, there is a high potential for additional archaeological resources to occur in the Canyon. Tecolote Canyon would have been an ideal location for habitation sites during prehistoric times, just as it was during the nineteenth and twentieth centuries, and would have been used for traveling from inland areas to the coast. The homestead sites documented in historic mapping and aerial photographs may contain structural remains, cultural features (such as privy pits, trash deposits, root cellars, wells, agricultural features, etc.) and artifactual material.

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3.5 Land Use and Recreation

Consistent with its natural resource character, existing land use within the Park is primarily open space (Figure 12, *Existing Land Uses*). The Tecolote Canyon Golf Course is located in the central portion of the Park. A natural gas pump station is located to the south of the golf course. The main entrance to the Park, located at the eastern end of Tecolote Road, contains the Tecolote Nature Center, which houses interpretive displays, a classroom for school field trips and lectures, and City Park and Recreation Department staff offices.

Mount Acadia Boulevard, Snead Avenue, Boyd Avenue and Balboa Avenue traverse the Park. Numerous public utilities also are located within the Park as shown in Figure 13, *Public Utility Corridors*. The U.S. Navy maintains a jet fuel line running from the Park's main entrance to the golf course driving range. City water lines occur in the southern portion of the Park, as well as in Balboa and Boyd Avenues. The Tecolote Canyon Trunk Sewer exists as a 15- to 24-inch pipe throughout the length of the Canyon, and an 18-inch sewer parallels the main in the southern portion of the Canyon. Fourteen side mains enter the Tecolote Canyon Trunk Sewer at various locations. Nearly 80 stormwater drains also enter the Park from the surrounding development.

In addition to public facilities, private utility companies also have linear facilities within the Canyon. SDG&E facilities accommodated by easements and/or rights-of-way within the Park include above-ground transmission lines throughout much of the Park and an underground natural gas line running north-south through approximately the southern half of the Park. SBC communication lines are located in the vicinity of Balboa Avenue.

Entrance into the Park can be achieved at numerous access points located throughout the Park's perimeter. Many of these are intended for use by neighborhood residents, and are not shown on Park maps. Nine primary public access points, most of which are located adjacent to a park, recreation center or school, are recognized (Figure 14, *Public Access*). The Park contains approximately 6.5 miles of trails that can be used for jogging, walking and mountain biking, as well as passive recreational activities such as wildlife viewing and aesthetic enjoyment. The Tecolote Canyon Golf Course offers an 18-hole public golf course and driving range, which were designed by legendary golfer Sam Snead and built in 1964 (Battle, pers. comm.). All recreational activities within the Park are day-use only, with the exception that the golf course is open until 8:30 P.M.

Surrounding existing land use is primarily single-family residential (Figure 12, *Exiting Land Uses*). Other land uses within 500 feet of the Park boundary include multi-family residential, a mobile home park, commercial uses, churches, schools, open space and recreational areas. There are 22 schools, ranging from kindergarten to college, located within one-half mile of the Park boundary. Most of the open space areas outside of the Park are contiguous to the open space within the Park, but are not owned by the City. Several of the recreational areas (i.e., community and neighborhood parks) abutting the Park provide access to the Park's hiking trails. Recreational activities at the community parks include sports such as basketball, baseball, softball, tennis, aerobics and other active sports. The community parks also provide Park users with improvements such as restrooms, parking lots, playgrounds and picnic tables.

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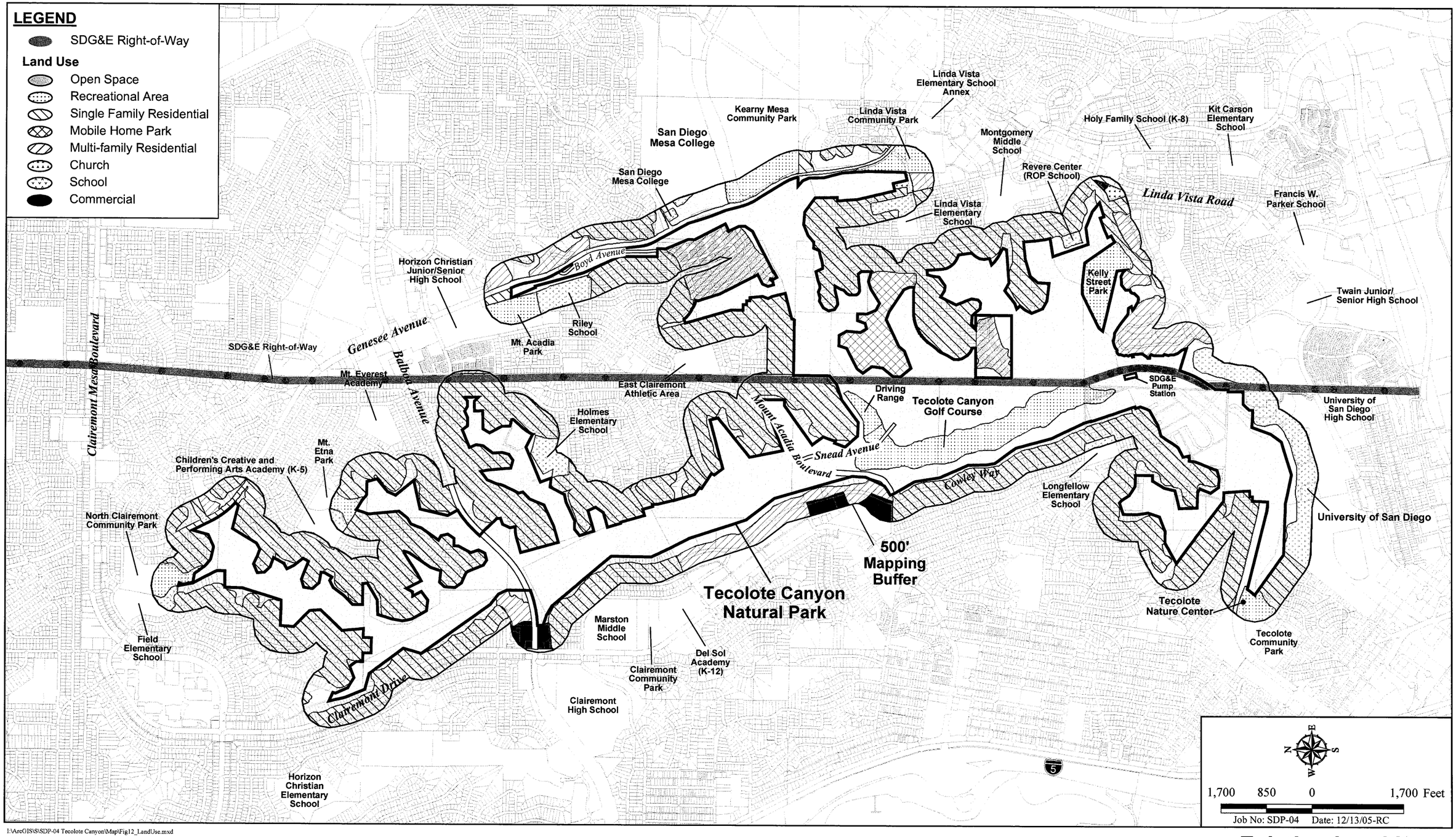

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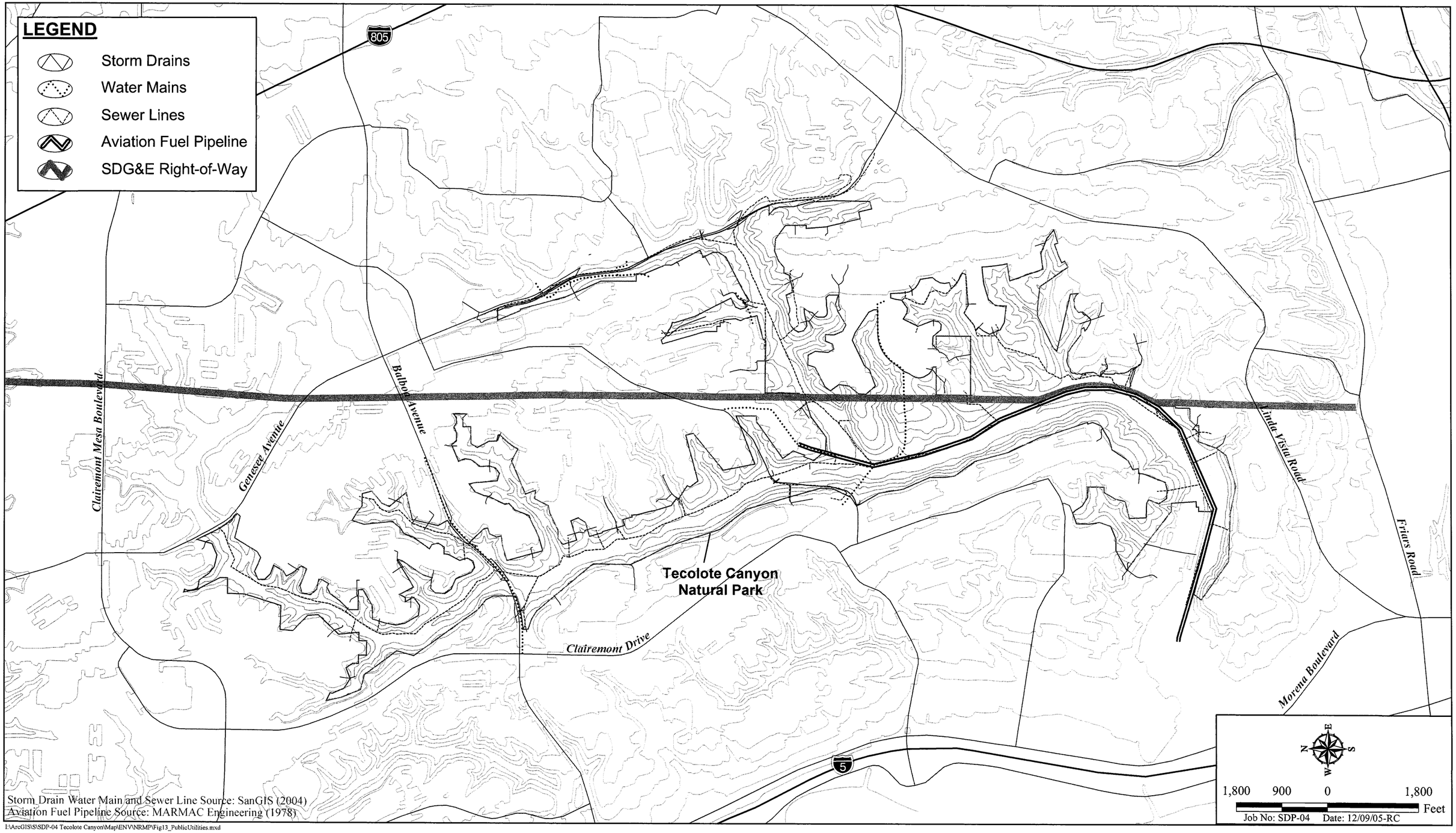
Existing Land Uses

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 12



Storm Drain Water Main and Sewer Line Source: SanGIS (2004)
Aviation Fuel Pipeline Source: MARMAC Engineering (1978)

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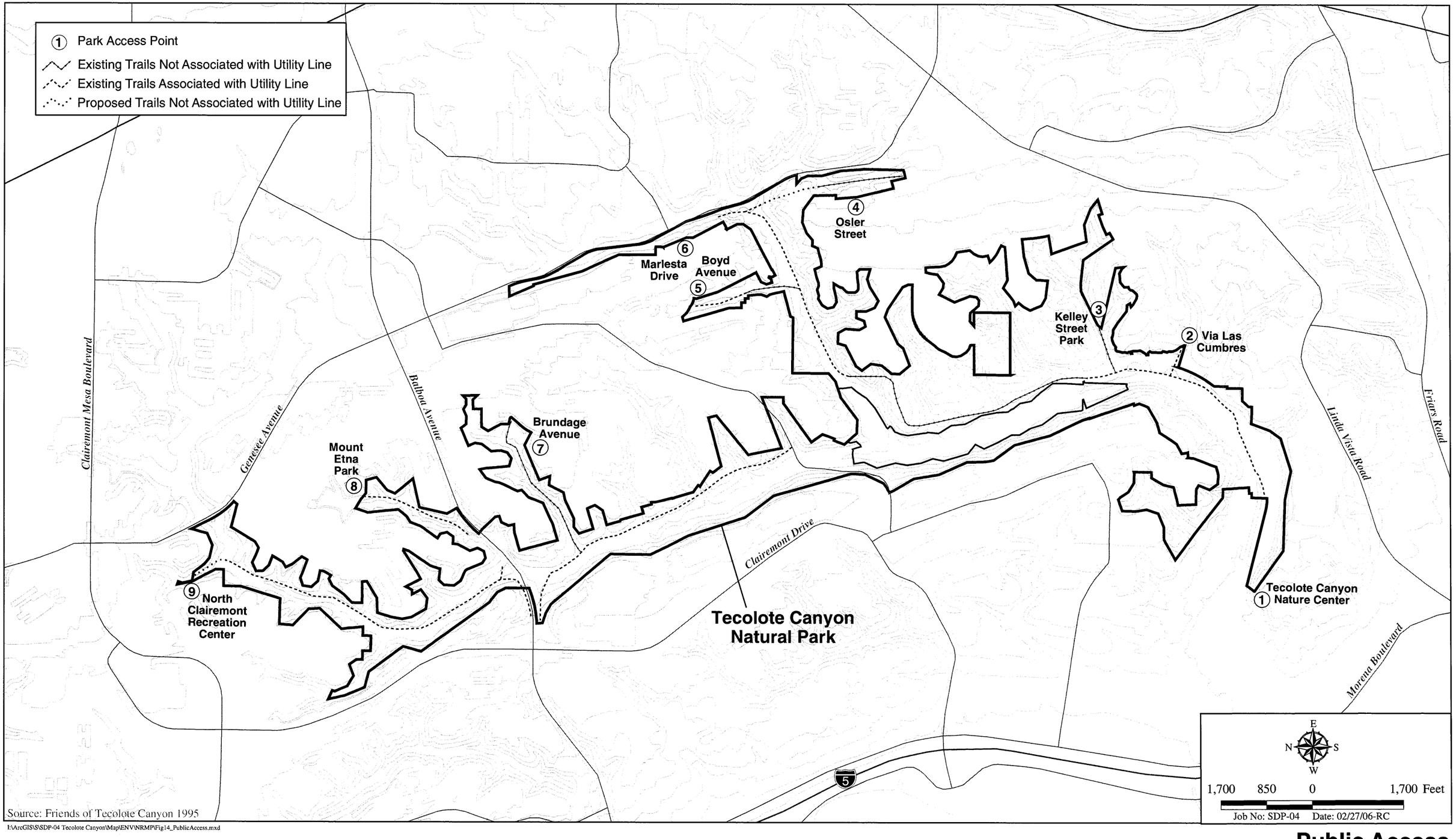
Public Utility Corridors

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 13



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Public Access

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 14

4.0 STATEMENT OF PROBLEM

Management of natural resources in the Park must consider impacts from public use, urban encroachment, utility easements, urban runoff, brush management and exotic plant species.

4.1 Public Use

The Park is used by residents of adjacent communities as well as those throughout the City and County. The Park and Recreation Department estimates that the Park receives tens of thousands of visitors per year. Presently, the Park is in almost constant use year-round for hiking, walking, running, bicycling, nature appreciation and golfing. This degree of use and the Park's setting, as a large natural open space in an urban area, bring user problems, such as litter control, trail erosion and damage to resources. Some Park users (off-trail hikers, bicyclists and transients) have created numerous unauthorized trails, often in inappropriate, sensitive habitat areas. Transients also sometimes build illegal encampments in the Park. Overuse of the Park trails and other resources may increase as the number of visitors increases. This misuse and overuse result in damage to trails, hillsides, natural resources and historic artifacts, as well as a decrease in Park aesthetic values. This pressure will continue to increase as the population rises.

4.2 Urban Encroachment

The Park's adjacency to residential areas results in refuse dumping, illegal bicycle and pedestrian access, and some backyard encroachment into the Park. Non-native landscape plants also have invaded the Park from adjacent residential and commercial areas, as well as from development upstream of the Park. Increased runoff from surrounding urban development and upstream water sources introduce sediments and pollutants, such as oil and heavy metals, which contribute to the degradation of the Park.

A problem also exists with the misuse of open space by adjacent and local residents. In some cases, residents with property adjacent to open space easements or publicly-owned open space consider it an extension of their backyards and clear the area of native vegetation (without appropriate permission); plant non-native vegetation or gardens; build spas, decks and/or fences; and/or dump trash and/or yard waste. In so doing, they are encroaching on public property and violating the law.

4.3 Utility Easements

Several utility easements traverse the Park, including electricity, natural gas, jet fuel, water and sewer. Monitoring and maintenance of utilities can result in impacts to the Park (see, however, Section 2.3 with regard to SDG&E operational protocols). For example, use of heavy equipment during maintenance of utilities within the Park contribute to erosion and damage to other Park resources. When taken off designated access roads, equipment can damage wetlands and other sensitive habitat, impact aesthetic values and increase canyon erosion.

Sewer pipeline breaks in the Park contribute to the degradation of water quality in the Park and Mission Bay as sewage flows into Tecolote Creek and associated tributaries. Emergency repair equipment and crews can cause similar damage to habitats as maintenance equipment and crews. Noise generated during the repair of pipeline breaks can disturb Park users and wildlife. If night work is necessary during emergency repair work, required lighting also may disturb Park wildlife. Aesthetic

values of the Park are temporarily impacted when sewer lines are exposed. Users may not be permitted in portions of the Park during repair activities.

The U.S. Navy's jet fuel line that traverses the Park has broken once (Battle, pers. comm.). This break, which occurred outside of the Park at the intersection of Mount Alifan Drive and Genesee Avenue, was repaired quickly. The U.S. Navy regularly performs maintenance of the fuel line. If the pipeline were to break again, impacts associated with repair would be similar to those described for sewer line repairs.

As described in Section 6.1, the City's Metropolitan Wastewater Department currently is planning a project to repair existing sewer lines and improve access in the Canyon to minimize the damage associated with future emergency repairs. Appropriate access (which minimizes biological impacts and the potential for unauthorized use) is especially important because sewer emergencies typically occur in association with major rain events, and as a result, damage from utility vehicles is often exacerbated.

4.4 Urban Runoff

Erosion and redeposition will continue as part of the natural process of succession. Urban runoff, storm drains and human disturbance, however, are accelerating the natural process by concentrating flows, increasing flow velocity and damaging vegetation. As stated in Section 3.1, most areas within the Park have moderate or high erosion potential. Erosion has been noted within previously disturbed slopes and unvegetated areas within the Park. Bank erosion is a problem in several places along nature trails and in tributary canyons, resulting in damage to riparian habitat and hazards to public safety. Point runoff in existing roads and trails is leading to the creation of rills (small channels created by erosion). Scouring is occurring at unpaved road/trail stream crossings. The resultant erosion is causing public safety hazards, silt redeposition and loss of sensitive habitat. Erosion can also lead to the exposure of sewer lines and storm drains within the Park, which makes them more susceptible to breaks. Extensive erosion control projects have been constructed in the Park in the past in an attempt to address this significant issue; however, urban runoff continues to create serious problems in the Park, particularly with regard to public safety.

Sand and gravel are carried from surrounding slopes into Tecolote Creek and associated tributaries in the Park during rainstorms. The eroded material entering the creek and tributaries eventually is deposited in Mission Bay, contributing to siltation problems in the bay. Runoff from adjacent development also contains pollutants, such as fertilizers, pesticides, vehicle lubricants, etc., that decrease the water quality of Tecolote Creek, associated tributaries and Mission Bay.

The flow of sediment from the Canyon to Mission Bay has been reduced through the construction of gabion structures (small rock walls) and planting of riparian vegetation along the creek south of the golf course. City engineers projected a 40 percent reduction in silt flowing into the bay as a result of these improvements (no author 1991).

4.5 Brush Management

Fire is a concern for property owners adjacent to open space. The City Fire-Rescue Department recommends brush management be performed 100 feet from structures (i.e., within the brush management zone). Brush management Zone 1 extends 35 feet from the structure, while Zone 2 extends an additional 65 feet beyond that point. Only Zone 2 brush management, which includes selective thinning and pruning of 50 percent of the brush in order to reduce fuel loads, is allowed in

the MHPA. Brush thinning has not been performed by the City on a routine basis within the Park due to lack of funds. Brush management by the City currently is generally performed only when an adjacent property owner files a request with the City. Adjacent property owners also can perform thinning in the Park (within 100 feet of their house) if they first obtain a Brush Management Right of Entry Permit from the City Park and Recreation Department's Open Space Division; however, many homeowners do not maintain their brush management areas. Because thinning has not been routinely performed, fuel loads within the brush management zone are increasing. Controlled burns would not be feasible within the Park due to the immediate proximity of urban land use. The City currently is researching additional techniques and resources for routine brushing of Park land along the Canyon rim.

4.6 Exotic Plant Species

As discussed in Section 3.3, Biological Resources, and illustrated on Figures 11A through C, many exotic plant species have become established in the Park and cover large areas. Specifically, 138 non-native plant species have been documented within the Park, including 14 that are considered exotic pest plants of great ecological concern. The presence of such species in the Park is primarily due to invasion from adjacent residential yards and introduction by historic agricultural and homesteading activities. Runoff from residences also is encouraging the growth of exotic plant species on the slopes of the Canyon. Iceplant covers the slopes of many areas in the Park, as it spreads beyond residential property lines and firebreak requirements. Areas that have been disturbed by past agricultural activities; unauthorized trails; utility line construction, maintenance and repair; dumping; and washouts are susceptible to invasion by exotic plants.

The eradication of exotic plant species requires continual, intensive effort due to the extensive nature of the Park/urban interface. Removal has not been done by the City on a routine, comprehensive basis within the Park due to lack of funds. Park staff and volunteers perform various maintenance tasks in the Park including invasive species removal. For example, in 1987, Friends of Tecolote Canyon organized volunteers to clear and revegetate an approximately two-acre site south of the Tecolote Canyon Golf Course and across the dirt access road from the SDG&E substation, to improve its viability as a nest site for the federally listed endangered least Bell's vireo. Friends of Tecolote Canyon and other non-profit organizations also have undertaken a number of other restoration and enhancement projects in the Park, and a regular team of volunteers called the "Weed Warriors" meets weekly in the Park to remove exotic plant species. Volunteers, however, are typically only able to restore small areas (i.e., less than one acre) at a time. Due to the proliferation of these species, exotics are still abundant throughout the Park. Recommendations for future exotic plant species removal efforts are contained in Sections 6.2 and 9.1 of this NRMP.

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5.0 CONSTRAINTS AND OPPORTUNITIES

Tecolote Canyon Natural Park offers an opportunity to combine recreational and community planning with the protection and enhancement of natural resources. These opportunities have, to varying extents, already been realized through the current Park management. The implementation of others may be limited by funding and external constraints.

5.1 Constraints

The TCNP NRMP recognizes the following constraints that may limit management of the Park:

- The primary purpose of the TCNP NRMP is to protect, preserve and enhance natural resources in the Park. The Park is in an urban setting, however, and management of the Park must consider the proximity of residential uses, as well as the Park's requirement to help fulfill local and regional recreational (passive) needs. As a result, it cannot be managed solely as wildlife habitat.
- The extent of adjacent development, previous resource disturbance and current recreational pressures within the areas surrounding the Park preclude ever returning the entire Park to undisturbed habitat.
- The urban development completely surrounding the Park makes effective access control difficult.
- The Park contains several utility easements, as discussed in Section 4.3, and, therefore, management of the Park must allow for the maintenance and repair of utility lines. Maintenance and repair, as well as sewer, storm drain and jet fuel line breaks, result in disturbance to habitat, plants and wildlife.
- The surrounding urban development requires brush removal for safety reasons, which impacts native habitat functions and values, and creates visual impacts.
- Protection of natural resources, as required by state and federal law, precludes or restricts certain human activities (e.g., construction activities and regularly scheduled utility maintenance/repair) from certain areas during breeding seasons.
- Exotic plant species occur in many areas throughout the Park. Establishment and proliferation of these plants, combined with the expense and effort involved in their control, make maintenance and restoration of the Park's natural habitat difficult.
- Storm drains that enter the Park from the surrounding watershed result in increased potential for erosion and water quality impacts.
- The majority of the soils within the Park have moderate to high erosion potential, making siting of trails and other facilities difficult and increasing ongoing management problems such as erosion control.

5.2 Opportunities

Opportunities for preserving the Park's resources (i.e., habitats, plants, wildlife and cultural resources) and maintaining a place for recreational activities include the following:

- The Tecolote Nature Center at the Park's main entrance provides opportunities for visitors to learn about the natural and cultural resources within the Park, as well as the history of the area.
- The presence of 22 schools, ranging from kindergarten to college, within one-half mile of the Park provides opportunities to educate students regarding natural and cultural resources and for them to participate in restoration activities.

- The many roads and homes surrounding the Park provide visual and physical access, allowing the Park to be regularly enjoyed by thousands of people.
- Many local and County residents have shown interest in the management of the Park and support of the preservation of its natural resources. Non-profit community organizations, including Friends of Tecolote Canyon, Boys and Girls Club, Girl Scouts and I Love a Clean San Diego, sponsor maintenance and restoration activities within the Park year-round. A regular team of volunteers called the "Weed Warriors" meets weekly in the Park to remove exotic plant species.
- The Boy Scouts have been involved in a number of restoration and interpretation projects in the Park.
- Federal, state and local regulations provide protection for major biological elements in the Park.
- Many existing recreational activities in the Park are compatible with natural and cultural resources.
- Comprehensive planning and management can provide adequate protection measures for natural resources.
- Removal of non-native species and restoration of degraded habitats can substantially improve the overall natural resource system in the Park.
- Habitat improvement or restoration can be used as mitigation for future losses within the Canyon itself (from utility projects) or elsewhere within the region.
- The TCNP NRMP identifies potential habitat restoration areas and is an aid in securing grant funding for future habitat restoration projects.
- Additional information can be gathered regarding the Park's cultural resources to aid in their protection and interpretation.
- Natural and cultural resources within the Park can be used for research and enhanced educational purposes.
- The location of the Tecolote Canyon Golf Course within a natural park provides the opportunity for membership in the Audubon Cooperative Sanctuary Program for Golf Courses.

6.0 LAND USE PROPOSALS

6.1 Sewer Access Project

As described in Section 3.5 and shown on Figure 13, the City operates sewer pipelines located throughout much of the Canyon. Segments of the main trunk sewer were constructed in 1952, 1957 and 1975. The age of these pipelines, combined with the failure to perform routine inspection and maintenance, resulting in diminished access, contributed to several sewage spills, including a 1.5-million gallon spill just north of Mount Acadia Boulevard in 2001 (Earth Tech 2003).

As a result of concern regarding sewage spills, the City has prepared a Final Program Environmental Impact Report for a Proposed Canyon Sewer Cleaning Program and Long-Term Sewer Maintenance Program (Program EIR; Project No. 6020, City 2003a), which addresses approximately 253 miles of sewer pipelines in 263 canyons and other environmentally sensitive lands. The Program EIR implements performance criteria, procedural guidelines and mitigation measures to avoid, minimize and/or mitigate environmental impacts associated with short- and long-term sewer cleaning, inspection and maintenance.

The Canyon Sewer Cleaning Program provides for initial inspection, cleaning and (if necessary) temporary access creation. The majority of the sewer pipeline segments within the Park are classified as being within Significant Rain Event canyons, and are identified as high priority for inspection and any necessary cleaning based on the relative condition of the lines, the watershed in which they are located, and the water body that would be impacted in the event of a spill. Therefore, several cleaning, repair and maintenance projects already have been completed in various portions of the Park (Dudek 2003a and b, Tierra 2004). Impacts from these activities were avoided and minimized to the maximum extent possible at the direction of biological monitors. Nonetheless, some vegetation impacts did occur, primarily as a result of creation of temporary access routes (including vegetation trampling, trimming and removal).

The Program EIR requires that impacted areas not required for permanent access be restored in compliance with any applicable Park and Recreation Department management plans. Erosion control efforts typically are initiated within 90 days. Restored lands and erosion control treatments must be monitored for at least 25 months to ensure that erosion control measures are effective and that invasive exotic species are not expanding along access paths. The Program EIR also requires that all mitigation for impacts to environmentally sensitive lands due to the Canyon Sewer Cleaning Program must be initiated within three years from the date of cleaning and/or repair completion. On-site mitigation is required on property that is managed by the Park and Recreation Department, if determined feasible by the Metropolitan Wastewater Department. The Program EIR also includes requirements that the mitigation ratios and mitigation plans involving habitat creation, enhancement or restoration must be prepared in accordance with any applicable NRMP. Such proposals are subject to approval by the Department of Park and Recreation. Mitigation for emergency impacts was delayed until certification of the Program EIR and determination of long-term access needs; mitigation in the Park to date has therefore been limited to a small tree of heaven (*Ailanthus altissima*) removal project (Ball, pers. comm.). Sites for additional upland and wetland mitigation for long-term access improvement impacts have been identified by the Metropolitan Wastewater Department, as described in Section 6.2.

In January 2002, the City Council clarified under what conditions long-term maintenance access could be created to access sewers in canyons and other environmentally sensitive lands. Council Policy 400-13 identifies the need to provide maintenance access to all existing sewer lines in order to reduce the potential for sewer spills, with environmental impacts from these paths minimized to the extent possible through a variety of methods. Council Policy 400-14 includes a general goal of redirecting sewage flow out of canyons and other environmentally sensitive lands and into streets or other accessible locations, to avoid environmental impacts associated with sewer line maintenance and minimize the potential for sewage spills to go undetected for extended periods of time.

A cost-benefit analysis must be conducted for all sewer lines within canyons and other environmentally sensitive lands. Each cost-benefit analysis must include quantitative and qualitative costs and benefits and consider the life cycle cost of proposed alternatives. The life cycle cost refers to the period during which the facilities are expected to function before requiring replacement (typically 50 years for a pipeline, for example). Where the life cycle cost of redirecting flow is less than 35 percent higher than the life cycle cost of leaving the flow in place (and where environmental and community interest factors indicate that flow should be redirected), the policy dictates that the redirection should be undertaken. When redirection is found infeasible, City staff are required to develop a Long-Term Maintenance and Emergency Access Plan, which provides for ongoing periodic inspection, cleaning and maintenance of the sewer lines and associated access paths.

The City currently is evaluating the sewer lines in the Canyon in accordance with these policies. Numerous pump stations would be required to redirect flow from Tecolote Canyon. Due to the cost of these pump stations, it has preliminarily been determined that redirection of flow will not be considered feasible according to the criteria established by the City Council (Ball, pers. comm.). It is anticipated, therefore, that work will consist of replacement and/or rehabilitation of the existing sewer lines and (where necessary) improving or constructing appropriate permanent access.

Access planning efforts currently are underway. The majority of the sewer main access route has preliminarily been identified as requiring no improvement, or requiring only vegetation trimming. In some locations, however, modifications may be needed to create a new route or to make the existing routes more stable or passable (Earth Tech 2003). Where existing access routes may provide rational trail linkage, such routes will be improved to facilitate required maintenance and provide for sustainable, safe trail access. In addition, access likely will need to be constructed to enable equipment to enter the side mains in the Canyon (Rastakhiz, pers. comm.). The access plans will require approval by the City's Development Services Department, and any permanent impacts (including cutting down trees) associated with access improvements will require mitigation.

6.2 Park Restoration and Enhancement Projects

Habitat Restoration and Enhancement

Many areas in the Park would benefit from habitat restoration. Restoration includes removing exotic plant species and replacing them with the appropriate native vegetation. Other, smaller areas would benefit just from removal of exotics, providing an opportunity for natives to recolonize the area naturally. Restoration and enhancement efforts that have taken place in the past include removal of exotic vegetation and planting of native species, including two groves of riparian vegetation. In addition to these previous activities and ongoing enhancement efforts, restoration efforts at specific locations are planned by the Park and Recreation Department and Metropolitan Wastewater

Department, as described below. Recommendations for future restoration and enhancement are contained in Section 9.1.

Tecolote Creek Riparian Restoration Project

The Park and Recreation Department has been awarded a grant to complete a restoration project within a three-acre area near the Park's main entrance (Figure 15, *Proposed Restoration and Mitigation Projects*), and work currently is underway. Iceplant, concrete and asphalt have been removed from the area. The project also will include the removal of other exotic plant species, including garland chrysanthemum, tree tobacco and castor bean. Native plant species such as sycamore, cottonwood, mulefat and arroyo willow will be planted in the riparian corridor, with coastal sage scrub species along its upland border. Plants will be installed between November and March, so that the winter rains can help them become established. Most work, such as weeding, planting and watering, is expected to be undertaken by volunteers. Rangers and volunteers will continue to remove exotic plants and maintain new native plants throughout the duration of and after the term of the grant. The project is expected to be completed by 2009. It will build on habitat restoration work completed in spring 2000 (also completed primarily by volunteers working under a grant program), and likely will serve as a base upon which future restoration efforts can build.

Metropolitan Wastewater Department Tecolote Canyon Mitigation Project

The Metropolitan Wastewater Department has planned the Tecolote Canyon Mitigation Project to provide mitigation for upland and wetland impacts associated with the implementation of past emergency maintenance and repair projects within Tecolote Canyon (including tributaries to the main Canyon), as well as partial mitigation for anticipated future impacts, as described in Section 6.1. A total of 1.87 acres of coastal sage scrub and 1.63 acres of wetland habitat (oak riparian woodland and southern willow scrub) will be created in the Park as part of the current mitigation project (see Figure 15). The northern potential mitigation site is located immediately south of Balboa Avenue and west of Tecolote Creek. The southern site is located approximately 1,300 feet south of the Tecolote Canyon Golf Course along the southern bank of Tecolote Creek. The mitigation sites would be subject to minor grading and planted with oak riparian forest vegetation at the lowest elevations, followed by southern willow scrub and finally coastal sage scrub, which would transition to adjacent upland vegetation. It is anticipated that the project will be implemented in Fall 2006. Once an estimate of future impacts associated with sewer access improvements (refer to Section 6.1) is complete, the Metropolitan Wastewater Department anticipates identifying additional mitigation sites within the Park.

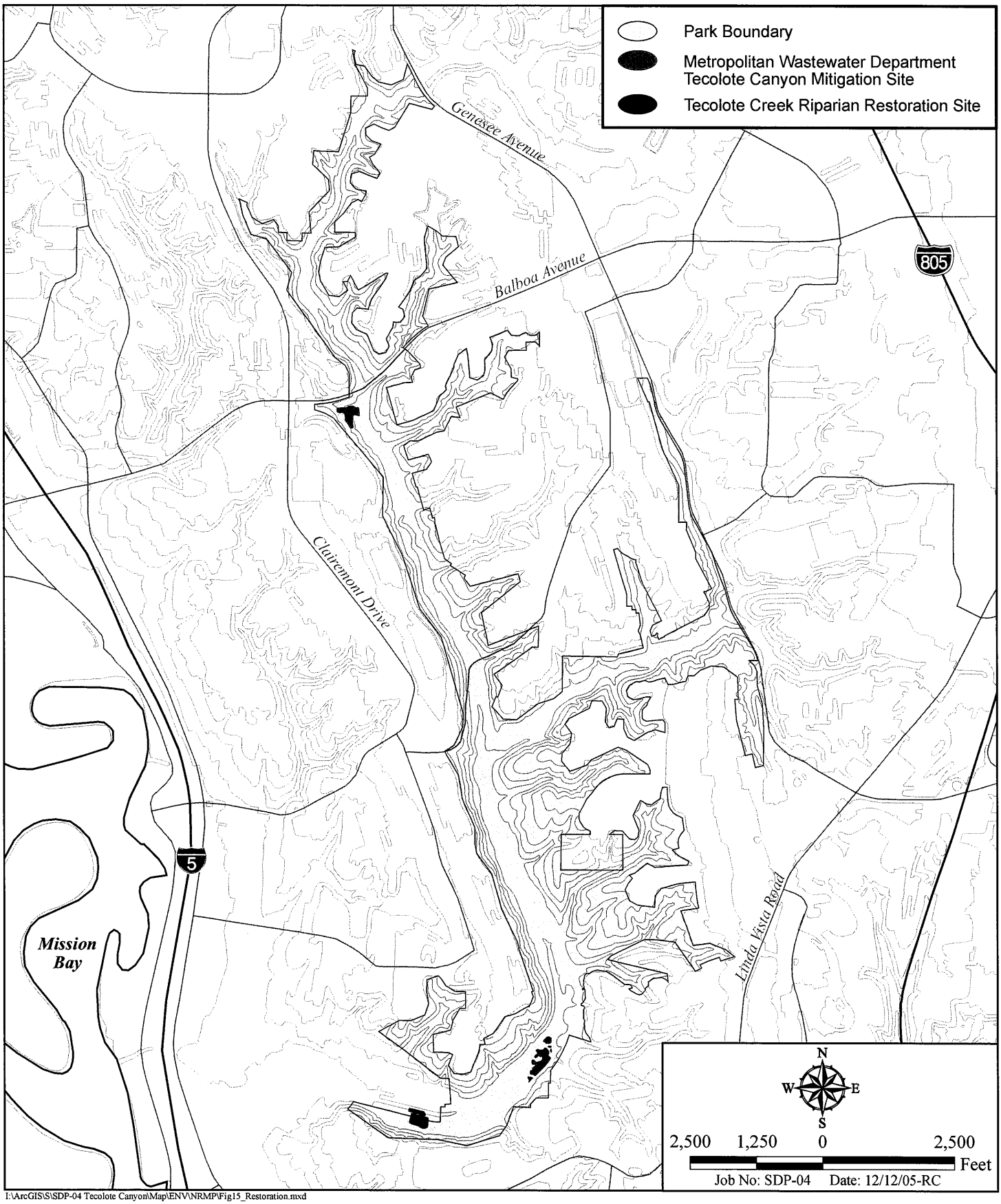
Cultural Resource Management

As described in Section 3.4, no comprehensive survey for cultural resources in the Park has ever been undertaken. If funding becomes available, it is highly recommended that such a survey, along with additional historic archival research, be conducted. Following this survey, a site-specific Cultural Resource Management Plan (CRMP) should be prepared by a qualified archaeologist for all prehistoric and historic resources in the Park. This site-specific CRMP should include (as applicable) a data recovery program, individual site inventory, and recommendations for maintenance, management, interpretation, and long-term protection of cultural resources, which may include on-site preservation or curation of resources. Representatives of the Native American community should be contacted during development of the CRMP to solicit any concerns regarding cultural heritage issues and, if so

desired by the Kumeyaay representatives, Native American monitors should be on site during any testing and data recovery programs. If Park improvements are proposed that may affect cultural resources, a testing program must be undertaken to assess site significance and the significance of potential impacts under the California Environmental Quality Act (CEQA) and the City (refer to Section 8.2).

Trail Closures

Not every trail in the Park is in an appropriate, approved location. Some are volunteer trails created by public foot or bike traffic and/or utility maintenance equipment without considering potential erosion or impacts to cultural or natural resources. Officially recognized existing and planned trails are illustrated on Figure 14. A volunteer effort currently is underway to inventory all existing trails in the Park. The Park and Recreation Department also is completing a master trail inventory for the entire City. Upon completion of the inventory, a review will be undertaken to determine which trails are in appropriate locations. Trails that currently are not officially recognized but that are identified as "high-use," have reasonable linkages to existing trails or destinations, and are recognized as rational and reasonable trail alignments may be added to the inventory of official trails as a result of this process. The alignments of some of these trails are currently degraded, but with repairs may be improved. To protect resources and minimize erosion, trails that are not necessary for utility access or determined to be in a desirable location as a result of the trail review process shall be designated for closure and habitat restoration. Alternative trail alignments also may be identified as preferable as a result of this process. Park and Recreation Department staff in consultation with the Tecolote Canyon CAC will make determinations regarding trail alignments. These decisions will be incorporated into the Trails Master Plan currently under preparation by the City, which is anticipated to be completed in Winter 2006/2007.



Proposed Restoration and Mitigation Projects

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 15

7.0 MAINTENANCE, USAGE AND DEVELOPMENT GUIDELINES

The Park is open to the public and is heavily used. Maintenance activities are required for public safety, sanitation and preservation of natural and cultural resources within the Park. The following maintenance activities are, or may be, conducted within the Park and, unless otherwise indicated, are the responsibility of the Park and Recreation Department:

1. Restroom Cleaning – once a day.
2. Litter Control – twice a week in parking lot; annual cleanup in other areas; and special volunteer projects for litter and illegal encampment removal, as needed.
3. Removal of Illegally Dumped Material – as soon as possible, where needed.
4. Graffiti Removal – as soon as possible from Park facilities.
5. Maintenance of Gates, Chains and Locks – as needed to prevent illegal entrance.
6. Signs – replacement, repair and cleaning as needed.
7. Removal of Safety Hazards – safety hazards, such as fallen trees or hanging limbs, along the trails are removed as needed.
8. Removal of Improper Public Activities – activities, such as transient encampments, private encroachments on public land, BMX tracks and paintball sites, placed in the Park illegally by the public are removed, as needed.
9. Removal of Exotic, Non-native Plants – as, and where, needed, by City staff or volunteers trained and/or supervised by City staff. Coordination with other parties conducting similar activities elsewhere in the watershed is desirable for optimal effectiveness.
10. Brush Management – brush removed or thinned within 100 feet of structures on adjacent property, per City Municipal Code 142.0412 to address Category I fire hazards, as determined by the City Fire-Rescue Department or Park and Recreation Department staff.
11. Trail Maintenance – major repair of trails once a year after the end of the rainy season to repair damage; minor repairs done throughout the year as needed.
12. Hazardous Materials Removal – when identified, hazardous materials should be removed per approved procedures.
13. Parking Lot Repair (Tecolote Recreation Center and baseball league) – parking lot adjacent to the Tecolote Nature Center maintained as necessary to repair damage.
14. Sewerline and Access Road Service (City Metropolitan Wastewater Department) – service manholes, monitor and maintain sewerlines and access roads as necessary; emergency repair as soon as possible.
15. Other Utility and Right-of-Way Maintenance (City Water Department, SDG&E, SBC, U.S. Navy) – general maintenance as necessary; emergency repair as soon as possible.

Activities are subject to all applicable City regulations, including the Environmentally Sensitive Lands Ordinance and Historical Resources Guidelines. In addition, implementation of the following guidelines would help protect native habitat and wildlife and preserve the natural park experience. Current maintenance activities that adversely impact the Park's existing conditions, as described in Chapter 3.0, will require mitigation, as outlined in Chapter 8.0, Mitigation Options and Guidelines.

7.1 Public Uses

1. Hiking and bicycling are allowed on designated trails only. All Park users are required to remain on designated trails for both the protection of themselves and adjacent sensitive

resources. Signs and maps identify appropriate uses for Park trails. All undesignated trails are closed to Park users.

2. Dogs must be on leash and remain on designated trails at all times within the Park.

3. All litter generated by Park users shall be carried out of the Park and placed in garbage cans provided at the Park's public access points. Trash cans are no longer placed in the Park because of past vandalism to trash cans and other Park amenities. Littering is prohibited.

4. The removal, harassment, injury and/or killing of animals within the Park are prohibited. This includes fishing in Tecolote Creek.

5. The removal and/or damage of plants or parts of plants within the Park are prohibited.

6. Park Rangers shall enforce State law, City ordinances and Park policies.

7.2 Park and Utility Maintenance and Improvement

1. Applicable City, state and/or federal permits must be obtained prior to performing maintenance (except in case of emergency) or improvement activities within the Park. Such activities will comply with guidelines in this NRMP. The Park and Recreation Department should be involved as early as possible in the project planning process and must approve all proposed project designs prior to implementation. Mitigation measures may be required to ensure the guidelines adopted in this NRMP are incorporated into project design.

2. Streambed crossing that would impact substrate or vegetation requires a CDFG Streambed Alteration Agreement. Other permits (i.e., CWA Section 404 permit from the Corps and CWA Section 401 certification from the RWQCB) may be required if crossing involves deposit of fill or dredge material in waters of the U.S.

3. Surveys for sensitive plant and animal species, as well as sensitive vegetation communities that may not be readily visible year-round (e.g., vernal pools) should be conducted at the appropriate time of year. For example, surveys for San Diego barrel cactus, wart-stemmed ceanothus and Shaw's agave could take place year-round, but surveys for Orcutt's brodiaea, San Diego button-celery and San Diego mesa mint are seasonally dependent.

4. All proposed projects and maintenance activities should avoid City-owned vernal pool sites and their associated watersheds that exist in the Park.

5. Any loss of natural wetland habitat is undesirable even when mitigation is attempted. No net loss of freshwater, riparian, vernal pool or other wetland habitats shall be allowed within the Park. Impacts to sensitive upland habitats covered under the MSCP shall be mitigated in accordance with the City of San Diego Biological Guidelines (refer to Section 8.1).

6. For new construction or trail realignment projects, a biological buffer zone of at least 100 feet should be established around sensitive habitats and sensitive species populations identified in Section 3.3, Biological Resources, of this NRMP, if feasible. A smaller or larger buffer may be

appropriate based on site-specific biological resources information. The appropriate buffer will be determined by a qualified biologist.

7. Parties proposing projects that would result in impacts to sensitive biological and cultural resources must be required to formulate and/or revise their plan to avoid/minimize the impacts to the maximum extent practicable.

8. Access must be maintained for emergency and maintenance vehicles. Road maintenance generally should be limited to clearing or thinning brush and smoothing the road surface within the existing roadway. Modified re-grading may, however, be required as needed (for example, in the area between the driving range and Genesee Avenue) to reduce erosion, under the direction of the Park and Recreation Department. Equipment operators should be trained regarding the Park and Recreation Department Open Space Division's Trail Standards (e.g., ribbon grading techniques).

9. All road repair and maintenance activities should be confined to the subject road(s) and/or existing access paths within existing easement(s). Work should be planned and coordinated with appropriate personnel and agencies in advance to ensure that no known sensitive biological, archaeological and other cultural resources occur in the proposed project site. Any emergency repairs that involve impacts to habitat must undergo the appropriate emergency CEQA review and/or development review process, as determined by the City's Development Services Department.

10. Siting of any new access roads/trails by any City departments should be reviewed to identify changes that could be made to minimize impacts on sensitive areas and species, cultural sites, wetlands, erosion and aesthetic values. Existing access roads should not be widened and new roads should not be constructed without appropriate environmental review. If any road or trail is re-routed, the vacated areas must be revegetated.

11. Any (temporary or permanent) access road or trail construction or improvement (including emergency access paths) should be designed in accordance with the City's Trail Standards (City 2004a; Appendix C). Specific conditions may be modified by agreement with the Park and Recreation Department Open Space Trails Manager, or other Park and Recreation Department staff authorized to make trail modifications.

12. Paved areas within the Park ought to be minimized to avoid water quality, hydrology and aesthetic impacts.

13. Development, construction or maintenance designs or activities must avoid concentrating runoff.

14. Mowing (to six inches, or the greatest feasible height) and trimming, rather than grading, should be the method of vegetation removal, if needed to eliminate/reduce fire hazard, provide safe access or improve view of a utility facility.

15. To the extent feasible, any stream crossing for maintenance activities should be done during seasons of low water flow (e.g., summer) to minimize impacts to the stream. Stream crossing by vehicles will be limited to reduce impacts to water quality.

16. Construction and routine or planned maintenance activities will not be conducted during the rainy season when soils are wet.

17. Regular maintenance activity and new construction that would directly impact habitat shall avoid nesting/breeding seasons in habitats occupied by sensitive species (March 1 through August 15 in coastal sage scrub; March 15 through September 15 in riparian habitats), in accordance with the City's MSCP Subarea Plan and Biology Guidelines.

18. Habitat features (e.g., trees) containing raptor nests shall not be removed during the raptor breeding season (December 1 through July 31).

19. Parking or driving under the canopy of oak trees and all large trees is not permitted in order to protect tree root systems, unless impacts to the trees have specifically been authorized.

20. Dust will be controlled with regular watering during any access clearing activities as a general construction practice; however, this requirement may be waived at the discretion of appropriate Park and Recreation Department Open Space Division staff. Additionally, vehicle speed on access roads is limited to 15 miles per hour at all times.

21. All construction and maintenance materials will be disposed of in an appropriate manner and location.

22. A qualified biologist and/or archaeologist (as appropriate) funded by the entity conducting the activities should monitor sensitive areas impacted and/or potentially impacted during construction or maintenance activities.

23. Sensitive habitats and/or resources within the vicinity of the area undergoing disturbance must be coned, flagged, fenced or otherwise identified/marked by Park Ranger staff, Natural Resource Planner or qualified biologist and/or archaeologist. Maintenance work crews and equipment would not be permitted in these areas.

24. In accordance with the City's Historical Resource Guidelines, qualified archaeologist will conduct a site check for archaeological resources prior to activities that may disturb substrate. If potential indirect impacts may occur, the area must be flagged to keep work crews away. If direct impacts may occur, the maintenance project should: (1) try to avoid the area; (2) minimize the impact; and (3) develop and implement a plan for recovery of resources subject to approval by the City. Native American consultation should be performed, as appropriate, during any cultural resources impact analysis and mitigation design and implementation. Additional details regarding cultural resources mitigation are contained in Section 8.2.

25. The project biologist will conduct a daily pre-construction walk-through of areas to be affected by that day's work. If an unidentified plant, nest or burrow is discovered on a project site, activities would stop until the Project Biologist has identified the plant, or the animal that utilizes the nest or burrow, and determined the appropriate action(s), if necessary, to avoid or minimize impacts prior to work resuming.

26. All construction, maintenance and emergency response activities shall use approved City of San Diego best management practices for erosion control and should include public safety measures, such as temporary signs and/or barricades.

27. Any disturbance of stream banks that would cause erosion and/or create a potential erosion risk must be mitigated by revegetating the disturbed area as soon after the disturbance as possible. Bank protection, such as mulch or jute netting, may be required in the interim period.

7.3 Utility Maintenance

In addition to the guidelines in Section 7.2 that apply to all Park and utility maintenance projects, utility maintenance projects are subject to the following guidelines:

1. In accordance with Council Policy 700-17, public utilities are permitted to cross dedicated open space areas if such crossings do not significantly interfere with the Park or recreational use of the Park. Revegetation and any other required mitigation outlined in appropriate permits and Section 8.1 of this NRMP is required after installation or maintenance of utilities within the Park.

2. A Memorandum of Understanding or Letter of Agreement with each utility company that conducts maintenance activities within the Park should be developed to outline specific conditions for maintenance activities within the Park.

3. Maintenance activities and use of easements provided for SDG&E, Metropolitan Wastewater Department, U.S. Navy and SBC must be coordinated primarily with Park and Recreation Department Open Space staff. Notification of the appropriate City staff should also happen as soon as possible when emergency maintenance is required.

4. Prior to entering the Park, all members of maintenance work crews must complete a training program for crews working in environmentally sensitive areas. Crews will routinely be trained and advised on how to minimize impacts to the environmental resources within the Park during maintenance activities. City Park and Recreation Department Open Space Division staff will either provide training materials to maintenance staff, or conduct a "tailgate" training session on an annual basis.

5. All vehicles, personnel and equipment will remain in the existing right-of-way/easement.

6. Additional guidelines for the Metropolitan Wastewater Department, maintenance/emergency activities include:

    - Activities will be performed in accordance with the City's Municipal Code, Council Policies 400-13 and 400-14, Coastal Development Permit No. 13506/Site Development Permit No. 13507 (CDP/SDP) for the Canyon Sewer Cleaning Program and Long Term Sewer Maintenance Program (City 2004b; or other permit requirements, as applicable) and the Mitigation Options and Guidelines (Chapter 8.0) contained in this NRMP.

- Relevant provisions of the CDP/SDP include the following:
  - Revegetation/restoration of access paths and impacted areas requiring restoration shall be initiated within 90 days of project completion or prior to the beginning of the next rainy season;
  - Areas where on-site mitigation is not proposed or required, and which are outside the pathway needed for ongoing and long-term maintenance access, will be revegetated with native vegetation and required to meet success standards within 25 months;
  - Access paths and other areas required for ongoing maintenance are not subject to restoration requirements or success standards, but erosion control (preferably with native vegetation) is required;
  - The use of plastics in erosion control materials is to be minimized, and plastics are to be removed before they decay or when they are no longer needed; and
  - All alternatives available will be reviewed for stream crossings, and flexible materials such as interlocking matting or other permeable material will be used instead of cement where possible.

7. The SDG&E Subregional NCCP is the primary document that dictates how SDG&E will conduct its facility and utility siting, construction, operation and maintenance activities. This document includes the following provisions:

   - Any accidental damage to Park habitat outside the right-of-way/easement will be mitigated as outlined in SDG&E's NCCP Program. Mitigation is required for both direct and indirect impacts. Forms of acceptable mitigation, in order of importance, include avoidance, on-site mitigation, fee-owned easements dedicated to the MSCP and mitigation bank credits.
   - SDG&E will conduct all operations within the Park according to "Operational Protocols" outlined their NCCP Program (Appendix D). This NCCP Program serves as a 50-year permit with USFWS and CDFG and meets the requirements for the federal and state endangered species acts for 25 years, with an option for renewal up to 50 years.

8. Additional guidelines for the U.S. Navy and SBC, maintenance/emergency activities include:

   - Any accidental damage to Park habitat outside the easement will be mitigated per the Mitigation Options and Guidelines (Chapter 8.0) of this NRMP. Temporary impacts will be mitigated through on-site restoration, where feasible. Mitigation details would be outlined as part of the permit process with appropriate agencies.

7.4 Park Maintenance

In addition to the guidelines in Section 7.2 that apply to all Park and utility maintenance projects, Park maintenance projects are subject to the following guidelines:

1. Existing and proposed trails will be regularly evaluated by a qualified biologist and/or Park Ranger for impacts related to erosion and sensitive species/habitat. If impacts are identified, the need for trail closure, trail maintenance/improvement, or barrier placement will be evaluated by the Senior Park Ranger.

2. Evaluation of potential authorized use of existing access roads or existing unauthorized trails should consider whether they meet public safety standards, are located in sensitive habitat or cultural resource areas, and/or result in excessive erosion. Such evaluation will be undertaken by the Park and Recreation Department Open Space Division Trails Manager or Open Space staff as part of the Trails Master Plan (also refer to Section 6.2).

3. Trail maintenance will be initiated based on Park Ranger staff inspection and coordinated with the City Trails Manager or Open Space staff and, as necessary, with a qualified biologist and/or archaeologist.

4. Existing trails should be refurbished or relocated, if necessary, to be more environmentally sensitive (refer to Section 7.5 if substantial changes to trails are contemplated).

5. Trail closures may be necessary to allow recovery of native vegetation, facilitate wildlife movement, protect sensitive archaeological and biological areas, allow added protection for sensitive species during breeding season, provide erosion control, ensure public safety and allow for trail maintenance. Such closures may be temporary or permanent, depending on the purpose of the closure.

6. All fences and gates will be kept in good repair and promptly replaced, when necessary.

7. Barriers should be used at appropriate locations along trails in order to keep people on the trails and out of sensitive areas.

8. If barriers are needed, preference will be given to using a rustic style, such as peeler pole fencing, dense or thorny native vegetation, or logs and branches from fallen or felled trees.

9. Poison oak and other human nuisance plant species should be controlled only around highly used public areas, such as restrooms, trails, parking lots and interpretive displays. In other areas, it should be allowed to remain as part of the natural system.

10. Brush management activities should be performed in accordance with the City's new or proposed brush management guidelines. Brush management actions are exempt from mitigation requirements in this NRMP as long as sensitive habitats and species are avoided.

11. A formal reporting and enforcement procedure should be developed to prevent residential and/or landscape encroachment into the Park. Currently, the Park Rangers initiate enforcement of most encroachment issues, and sometimes refer them to the City's Code Enforcement Division.

7.5 Park Improvements

In addition to the guidelines in Section 7.2 that apply to all Park and utility maintenance and improvement projects, Park improvement projects are subject to the following guidelines:

1. The number and extent of trails within the Park should be limited to those identified for construction and/or maintenance in a trails master plan presently in the initial development stages. It is intended that these will include "primitive" trails, where appropriate, to enhance

hiking enjoyment while minimizing land recontouring, vegetation removal, and the appearance of development.

2. Existing trails/access roads should be upgraded in accordance with the City's Trail Standards (City 2004a; Appendix C), including accessibility standards, where conditions allow.

3. All new trail alignments or trail reconstruction must be approved by the Park and Recreation Department Open Space Division Trails Manager or Open Space staff. Such work should be in accordance with the City's Trail Standards, unless modifications are approved.

4. To the extent possible, trails should not be constructed parallel to SDG&E access roads. Rather, the City should continue to seek agreements with SDG&E to officially recognize utility access roads as authorized for public trails use. As part of an official agreement addressing trail use, SDG&E will require an acceptable trail indemnification agreement from the City for public use of SDG&E access roads and properties, including the fee-owned rights-of-way.

5. Trail placement should avoid known hazards, such as steep cliffs and the golf course driving range.

6. Trail placement should avoid conflict with community residents. For example, a trail too close to the private fence line could create a nuisance.

7. Trails should be constructed to provide access to prominent features or viewpoints that are likely to attract hikers, thereby minimizing off-trail trampling and compaction.

8. If feasible, a continuous trail connection should be constructed from the north to the south end of the Park, and a means to cross Tecolote Creek at the clubhouse and Balboa Avenue should be provided. This would require coordination with the golf course lessee.

9. Rehabilitation of existing trails or creation of new trails should use design criteria that reduce existing or potential impacts to biological (particularly sensitive habitats and species) and cultural resources. For example, the number of creek and riparian vegetation corridor crossings should be minimized. Impacts should be determined through biological and cultural resource assessment survey.

10. Trails should be relocated if endangered or sensitive plant species, key wildlife breeding habitats and archaeological sites with surface artifacts are found to be impacted by trail use.

11. Siting of new or re-routed trails should not follow ecotones (edges between plant communities) but rather be limited, if possible, to a single trail that winds through each plant community and crosses ecotone boundaries. This would optimize interpretive and recreational value while protecting species that often congregate in ecotonal areas due to the increase in biological diversity.

12. Trails should be located to avoid introducing adverse impacts, such as from highly erodible soils.

13. If barriers are needed, preference should be given to using a rustic style, such as a split rail or post and railing fencing, natural barrier plantings, or logs and branches from fallen or felled trees.

14. Lighting should not be used in the Park except where essential for public safety. Any lighting in the Park should be shielded, directional, low-intensity sodium vapor lights, especially near biologically sensitive areas. Low-voltage outdoor or trail lighting, spotlights and bug lights must not be used. Placement of lighting must consider the sensitivity of adjacent biological resources.

15. Noisy activities should be concentrated away from habitats where sensitive animal species occur or are likely to occur. These areas are variable depending on seasonal requirements of biological resources in the area.

7.6 Development Outside the Park

1. All new development or redevelopment adjacent to the Canyon should be required to comply with the Tecolote Canyon Rim Development Guidelines (City 1987; Appendix E) and applicable City height restrictions.

2. Any project within the Tecolote Creek watershed that may affect water quality or quantity downstream will be required to follow RWQCB standards and conduct monitoring studies for at least one season of normal rainfall. Any impact discovered during this monitoring period will require mitigation. Any upstream project resulting in future changes to stream flows should consider the natural resources management policies for the Park.

3. Any new development or redevelopment adjacent to the Park should provide a buffer or setback sufficient to accommodate any and all required brush management activities and mitigation for such activities, if required, outside the Park.

4. New development and residents should be encouraged to landscape with plants that are appropriate for fire protection and to avoid the use of non-native, invasive species in landscaping.

5. Any lighting associated with new development or redevelopment adjacent to the Park, especially near biologically sensitive areas, should consist of shielded, directional, low-intensity sodium vapor lights.

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8.0 MITIGATION OPTIONS AND GUIDELINES

Although Tecolote Canyon is a Natural Park, necessary utility and trail construction and/or maintenance activities, which may impact existing natural habitat and/or cultural resources, will be required. Biological and archaeological surveys are required prior to obtaining permits and any site disturbance. Applicable city, state and federal permits will be required. Any project additionally must comply with the applicable guidelines outlined in this NRMP, adopted by the City Council. Park and Recreation Department Open Space Division approval of project design, implementation and mitigation will be required to ensure that the guidelines adopted as part of this NRMP are being implemented.

Impacts to biological and cultural resources shall be avoided or minimized as much as possible during the design, planning and permitting phases. Maintenance activities should be planned in advance to use the least impactful methods, avoid breeding seasons, use only existing access ways (to the extent that appropriate access currently exists) and restrict impacts to the project area.

In the event that unavoidable direct or indirect impacts occur within the Park, the following guidelines provide an appropriate framework for mitigation. In addition to the requirement to appropriately mitigate for any impacts that occur within the Park, the Park may, in certain circumstances, be used to mitigate impacts that occur elsewhere. These guidelines also, therefore, address the procedures under which such mitigation proposals may be considered.

8.1 Habitat Mitigation

Mitigation for Impacts Occurring Within the Park

1. Unavoidable impacts to wetland/riparian habitats, maritime succulent scrub, native grassland, coast live oak woodland, Diegan coastal sage scrub (including ecotones) and chaparral must be mitigated at a ratio sufficient to provide equal or greater habitat value, in terms of both quality and quantity, including loss of interim habitat function. Mitigation ratios for habitat impacts will be decided on a case-by-case basis, using MSCP, Development Services Department and resource agency (CDFG and USFWS) guidelines. Mitigation options include the creation of new habitat, enhancement of existing disturbed or degraded habitat, or (for upland habitat impacts) payment into the City's Habitat Acquisition fund.

2. Mitigation should take place within the Park whenever feasible. The final location of mitigation shall be approved by the Park and Recreation Department Open Space Deputy Director or his/her designee. Decisions on the location of mitigation shall be based upon formulation of an environmentally sound, cost effective and politically acceptable mitigation plan.

Guidelines for All Projects Proposing Mitigation Within the Park

1. The following elements should be included as part of the Development Services Department's Mitigation, Monitoring and Reporting Program (MMRP) required for any mitigation project: what will be done; what criteria will be used to determine success; a schedule of work and monitoring; means of funding the program; penalties for non-performance to be enforced by the Development Services Department (e.g., an additional year of maintenance and/or

additional planting to meet success criteria, such as acreage, density and diversity, established in the approved mitigation plan); and a plan for remedial measures should they be necessary. It should also address the following design considerations:

a. A variety of habitat types to encourage diversity of species;
b. Vertical and horizontal plant diversity;
c. Irregular, rather than straight, borders;
d. Wildlife areas of concentration where vegetation is especially dense, extensive and connected to other habitat areas;
e. Use only of appropriate native plants;
f. Measures to limit human access to sensitive areas, such as use of thorny shrubs;
g. Temporary irrigation, if necessary, to help establish new vegetation; and
h. Non-native, invasive species removal on a regular basis for the duration of the MMRP.

2. A qualified biologist should oversee mitigation programs. A qualified biologist is defined as a person who is experienced in state-of-the-art revegetation techniques of wetland and/or upland habitat (as applicable). The qualified biologist will (1) prepare and oversee a detailed revegetation plan, meeting City Landscape Guidelines and guidelines outlined in this NRMP, including species, soil preparation and site plan; (2) assist a landscape architect, if needed, in preparation of landscape working drawings to assure species comparability, and to review planting requirements and revegetation techniques; and (3) develop and oversee implementation of a Monitoring, Maintenance and Reporting Program.

3. Prior to their implementation, all projects involving revegetation and/or mitigation within the Park must be reviewed and approved by the Park and Recreation Department (Senior Ranger and Natural Resource Manager). The review process should include recommendations from the Tecolote Canyon CAC. In the case of an SDG&E project, compliance with their Subregional Natural Community Conservation Plan (SDG&E 1995) will be the primary basis for approval.

4. The party proposing mitigation will be responsible for obtaining all applicable required City, state or federal permits prior to the commencement of mitigation activities. Mitigation credits may not be available for constructed wetlands that require regular maintenance; such proposals should be carefully coordinated with the applicable permitting agency(ies).

5. Projects proposing restoration of non-native grasslands in the Park to native habitats appropriate for the site should not be required to provide further mitigation for the loss of non-native grassland.

6. Revegetation efforts are best scheduled between October and February after the first rain if no irrigation is to be used.

7. Field checks by a qualified biologist of sensitive areas near the work area will be required prior to work to ensure that they have been properly flagged and protected from intrusion.

8. Temporary fencing and/or barriers, if necessary, should be provided to protect revegetation areas from human intrusion until they become well established.

9. Revegetation sites should be monitored regularly by a qualified biologist. Appropriate recommendations should be made for enhancing revegetation efforts to ensure that success criteria are met.

Guidelines for Mitigation of Impacts Occurring Outside the Park

It is often beneficial to combine mitigation projects in locations that can yield region-wide benefits. As described in Section 3.3, many of the Park's biological resources have been degraded and would benefit from restoration. As a result, it may be appropriate to use Park lands as mitigation for impacts occurring outside of the Park. The City generally limits use of City-owned land as mitigation to City projects; however, exceptions can be made in certain limited circumstances. Any applicant proposing to mitigate impacts within the Park would need to comply with the following guidelines, in addition to the general guidelines identified above:

1. The applicant should consult with the Senior Park Ranger and the Natural Resources Manager for suggestions regarding potentially appropriate locations for mitigation activities.

2. Any proposal to mitigate impacts occurring outside of the Park by creating/restoring/enhancing habitat within the Park are subject to the approval of the Department of Park and Recreation Open Space Division, and such proposals must be consistent with this NRMP.

3. The Tecolote Canyon CAC will act in an advisory capacity to Park and Recreation Department Open Space Division staff in suggesting potentially appropriate sites for mitigation and approving the mitigation proposal.

4. If the proposal involves specific maintenance, management and/or monitoring requirements in perpetuity, the Park and Recreation Department Open Space Division will require the applicant to provide an endowment the annual earnings of which are sufficient to fund such activities. If there are no such perpetual requirements as a permit condition, the Open Space Division will assume responsibility for management of the area following fulfillment of any success criteria required by the permit (typically after five years of monitoring and maintenance), without requirement for an endowment.

8.2 Cultural Resource Mitigation

Work anticipated within the Park that potentially could impact cultural resources is primarily limited to utility improvement and maintenance, trail construction and maintenance, and habitat restoration activities. It is recommended that a comprehensive survey of the Park be conducted to identify archaeological resources. It also is recommended that archival research and oral interviews with "old-timers" or those whose families lived in the Canyon during its agricultural days be conducted to address the history of the Canyon and to guide historic archaeological work. Representatives of the Native American community also should be contacted to solicit any concerns regarding cultural heritage issues.

If and when a comprehensive survey of the Park is conducted, a confidential map of cultural resources will be kept on file by the Senior Park Ranger at the Tecolote Nature Center. When a ground-disturbing activity is proposed, the applicant should inquire with the Senior Park Ranger whether a comprehensive survey of the Park has yet been conducted. If the results of such a survey are available,

the applicant should submit a plot plan of the disturbance area to the Senior Park Ranger for comparison to the confidential map. If a comprehensive survey has not yet been undertaken, the applicant should retain a qualified archaeologist to conduct surveys of the area to be affected. The results will be given to the Park Ranger or Natural Resource Planner for review and evaluation by a Development Services Department archaeologist. This information will be used to identify any potential impacts that could occur to known cultural resources.

The City's Historical Resources Regulations are intended to "protect, preserve and, where damaged, restore the historical resources of the City, which include historical buildings, historical structures or historical objects, important archaeological sites, historic districts, historical landscapes and traditional cultural properties." Mitigation guidelines in accordance with these regulations include the following:

1. If activities are proposed that may affect archaeological resources (historic or prehistoric), a testing program should be undertaken to assess site significance and the significance of potential impacts under the California Environmental Quality Act and the City's guidelines. The testing program should include an assessment of the extent and nature of the cultural resource site in case the majority of the site's resources are underground.

2. If any site that would be impacted is found to meet the criteria for inclusion in the California Register of Historical Resources, appropriate mitigation measures must be developed in consultation with City staff.

3. Impacts to cultural resources should be avoided through strict avoidance or through active preservation measures, such as site capping, whenever feasible.

4. If avoidance of impacts is not feasible, a Research Design and Data Recovery Program should be developed and implemented by a qualified archaeologist in consultation with City staff prior to any actions that would adversely affect the site.

5. Any cultural resources removed from a site, along with associated documentation, should be properly curated at an approved and federally recognized curatorial facility such as the San Diego Archaeological Center, or as determined by the Development Services Department.

6. Review by the City's Historic Sites Board could be necessary depending upon the type of activity proposed.

7. Native American consultation should occur prior to approval and during implementation of any activity potentially affecting a prehistoric cultural site. If so desired by Kumeyaay representatives, Native American monitors should be on site during any testing and data recovery programs.

8. A qualified archaeologist should be on site during disturbance activities to monitor the activity. The archaeologist should have the authority to halt, direct, or divert ground disturbance.

9. Flagging, fencing or other temporary measures should be provided to prevent accidental damage.

9.0 ENHANCEMENT AND RESTORATION GUIDELINES

9.1 Habitat Management

The following measures are recommended to manage and protect the Park's existing biological resources:

1. Periodic monitoring surveys of all known sensitive plant species in the Park should be conducted to monitor abundance and distribution and determine appropriate and necessary protective management and enhancement measures. In conjunction with these surveys, the presence and extent of non-native, invasive species should also be recorded to assess invasion or re-invasion. Trained volunteers may be used to supplement professional monitoring activities.

2. The Park's biological database, including vegetation communities, sensitive plant/animal species, and avifauna point counts, should be updated at least every ten years, or more often, as resources are available. Surveys for sensitive animal species should be designed to monitor both abundance and distribution.

3. Creek crossings should be appropriately stabilized to be environmentally suitable for protection of the creek bed to the maximum extent possible.

4. Areas where sensitive bird species are likely to nest, where sensitive plants are found or where restoration is underway may be closed to public access, at the discretion of the Senior Park Ranger and the Natural Resources Manager. Closed areas will be posted "No entry during breeding/nesting season" (with appropriate dates), "No entry due to sensitive habitat/plants," or "Native Habitat Restoration in Progress," as appropriate.

5. Adequate buffers to avoid trampling should be established around sensitive plant populations and vernal pools. Wherever possible, minimum buffer width should be 100 feet, or (for vernal pools) the size of the watershed, whichever is greater.

6. Where particularly sensitive resources occur in proximity to public (authorized or unauthorized) trails or roads, peeler pole fencing should be used to direct public access to appropriate locations. Signage may be installed on the fencing to explain to the public the sensitivity of the resource being protected.

7. The two vernal pools within the Park (see Figures 9D and 9F), excluding those within the SDG&E right-of-way, should be managed in accordance with the forthcoming City-wide vernal pool management plan. At a minimum, the following management and monitoring activities will be undertaken:

   a) Inventory each of the vernal pool complexes to determine the extent and configuration of the individual vernal pools and their associated watersheds.

   b) Secure the vernal pools and their associated watersheds as necessary to maintain habitat function and species viability. The vernal pool adjacent to the SDG&E right-of-way is much more at risk from vehicles, bicycles, pedestrians, and pets than the pools in the eastern

complex. Vehicles potentially pose the most serious threat to this pool. A barrier to prevent impacts from vehicles is essential and must be designed to avoid impacts to the pool's watershed. Signage advising park users and utility maintenance personnel of the sensitivity and need to stay out of the area should also be considered.

c) Remove trash from within each vernal pool complex during the dry season.

d) Monitor the vernal pools and their watersheds.
   i. Integrity monitoring to detect physical threats to the vernal pool habitat (e.g., erosion, dumping, vehicle ingress, weeds).
   ii. Periodic biological monitoring during the wet season to assess species composition and abundance, including exotic species.

8. Educational information should be disseminated to residents to heighten environmental awareness. Topics for educational campaigns could include the following:
   a) Illegal nature of encroachment (e.g., by landscaping, decks) into the Park;
   b) Importance of using only authorized trails;
   c) Benefits of landscaping with native species, including sources to obtain native plant materials;
   d) Detrimental effects of landscaping with non-native, invasive species;
   e) Procedures for conducting brush management; and
   f) Importance of controlling pets.

9. Following general public education campaigns to inform homeowners that encroachments into the Park are illegal, it is recommended that notices be sent to individual homeowners where encroachments are observed. The notices should be followed by enforcement action, if necessary.

10. To the extent possible, coordination should be established with adjacent educational institutions to encourage them to remove non-native, invasive species and use native species in campus landscaping, in accordance with the MSCP Adjacency Guidelines (City 1997).

9.2 Habitat Restoration/Enhancement

The abundance and value of the Park's biological resources would benefit from restoration and enhancement of currently degraded habitats. The need for such efforts is primarily due to invasion of non-native species from landscaping adjacent to the Park or elsewhere within the watershed, and introduction of non-native species by historic agricultural and homesteading activities. The goal of the efforts will be to preserve the natural history values of the Park as an example of a coastal canyon ecosystem. Thus, both wetland and upland habitats are of importance. The goal of the efforts will be to restore areas to the habitat that would naturally occur in a particular location and landscape position, rather than to a pre-determined notion of which habitats represent the "highest" value.

Any restoration or enhancement projects near, adjacent to, or within the SDG&E right-of-way require coordination with SDG&E, and any such proposed projects must not limit or restrict SDG&E's ability to conduct its utility activities or maintain reliable natural gas and electrical service to its customers.

Restoration and Enhancement Priorities

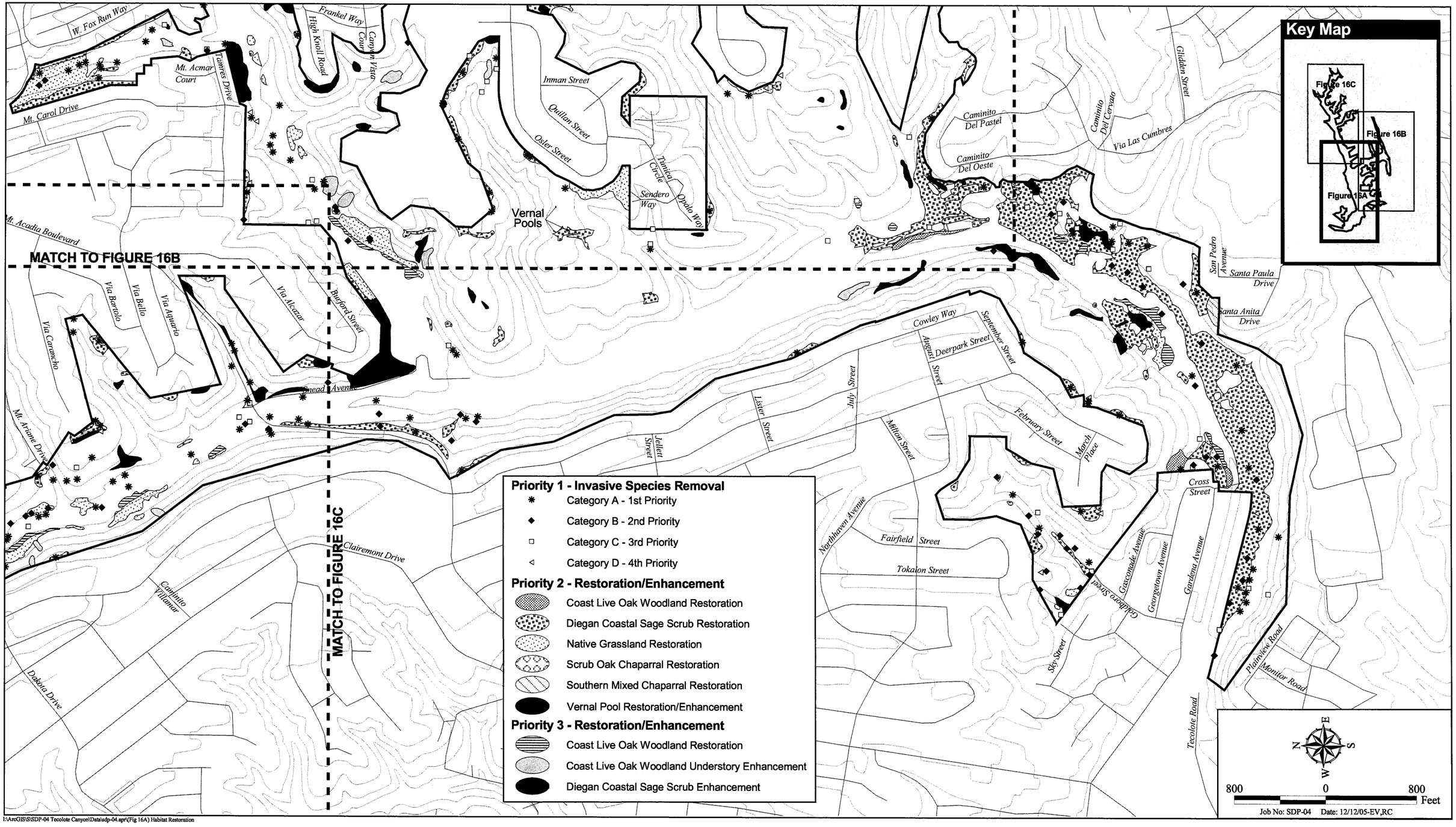
Figures 16A through 16C, *Habitat Restoration and Enhancement Opportunities*, identify and prioritize opportunities for future restoration and enhancement. Restoration and enhancement priorities were developed primarily by W. Larry Sward, a restoration biologist with over 20 years of experience in San Diego County, with input from the Tecolote Canyon CAC, Park Ranger and other biologists. The priorities are based on the level of threat to or degradation of the Park's resources. As a result, removal of invasive, non-native species has been assigned the highest priority. Priority 2 activities include replacement of disturbed habitat or non-native vegetation such as iceplant with appropriate native vegetation communities, seeding of non-native grassland with native grasses and restoration/enhancement of the two existing vernal pool complexes. Finally, Priority 3 activities include replacing non-native grassland with oak woodlands in appropriate locations, enhancing the understory of existing oak woodlands and improving the composition of disturbed coastal sage scrub. Restoration and enhancement efforts in the sliver of Park along Boyd Avenue should be considered a lower priority for use of limited resources because edge effects would make habitat in this area difficult to maintain, and would result in only a minimal increase in natural history values. Prioritization of specific areas for restoration/enhancement work should consider the immediate need of a specific area, the ability to defend the area from re-invasion and human impacts, and whether removal could increase the habitat available for use by MSCP covered species, such as least Bell's vireo.

Enhancement is an activity that improves the self-sustaining functions of the subject habitat. For example, it could involve the removal of exotic, invasive and/or non-native plant species or the provision of conditions designed to improve the habitat, thereby encouraging additional growth or usage. Invasive species to be removed, prioritized (A through D, with A representing the highest priority) by their potential threat to the Park's biological resources, are illustrated on Figures 16A through 16C (see Figure 11 for individual species locations) and listed on Table 7. The species were prioritized based primarily on their invasiveness, with consideration also given to their prevalence in the Park (i.e., species that occur in relatively small populations that potentially could be eradicated from the Park were given a higher priority than they might otherwise have been assigned). The priorities were refined based on the recommendations of members of the Citizens' Advisory Committee who are familiar with the spread of particular non-native species in the Park. For example, it was noted that Russian thistle formerly was not a problem in the Park, but has recently been rapidly spreading along the edges of trails; as a result, it was assigned a higher priority for removal.

The species assigned the highest priority include hottentot fig, fountain grass, pampas grass, fennel, giant reed, veldt grass, Brazilian pepper trees, and Canary Island date and Mexican fan palm trees. This prioritization is based on the fact that these species may become established in undisturbed habitats. It is not recommended that the large eucalyptus trees that were likely a windbreak for historic development in the southern portion of the canyon (refer to Section 3.4) be removed unless they become a public safety hazard; however, they must not be allowed to spread. Other large eucalyptus trees should be reviewed on a case-by-case basis, and (while they also should not be allowed to spread) should not be removed until plans are in place to undertake restoration activities in the affected area. There also is an apricot tree (*Prunus armeniaca*) that is associated with past farming activity near the Park's main entrance. This tree should not be removed because it is believed to have been planted by early settlers in the Canyon.

Table 7
INVASIVE SPECIES REMOVAL PRIORITIES

SCIENTIFIC NAME	COMMON NAME
Priority 1A	
Arundo donax	Giant reed
Carpobrotus edulis	Hottentot fig
Coraderia jubata	Pampas grass
Ehrharta calycina	Veldt grass
Foeniculum vulgare	Fennel
Pennisetum setaceum	Fountain grass
Phoenix canariensis	Canary Island date palm
Schinus terebinthifolius	Brazilian pepper tree
Washingtonia robusta	Mexican fan palm
Priority 1B	
Asphodelus fistulosus	Hollow-stem asphodle
Atriplex semibaccata	Australian saltbush
Brassica sp.	Mustard
Centaurea melitensis	Tocolote
Chrysanthemum coronarium	Garland chrysanthemum
Gaura sinuata	Wavy-leaf gaura
Malephora crocea	Croceum iceplant
Mesembryanthemum crystallinum	Crystalline iceplant
Ricinus communis	Castor bean
Salsola tragus	Russian thistle
Schinus molle	Peruvian pepper tree
Priority C	
Acacia longifolia	Golden wattle
Asparagus asparagoides	Florist's smilax
Carduus pycnocephalus	Italian thistle
Conium maculatum	Poison hemlock
Eucalyptus sp.	Eucalyptus
Fraxinus uhdei	Shamel ash
Hedera helix	English ivy
Marrubium vulgare	Horehound
Myoporum laetum	Myoporum
Nicotiana glauca	Tree tobacco
Robinia idahoensis	Idaho locust



Habitat Restoration and Enhancement Opportunities

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 16A

Priority 1 - Invasive Species Removal

- Category A - 1st Priority
- Category B - 2nd Priority
- Category C - 3rd Priority
- Category D - 4th Priority

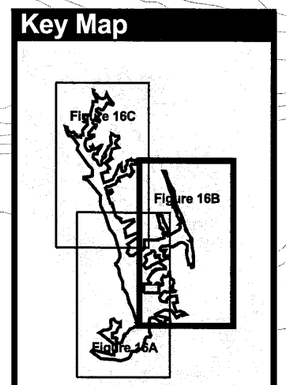
Priority 2 - Restoration/Enhancement

- Coast Live Oak Woodland Restoration
- Diegan Coastal Sage Scrub Restoration
- Native Grassland Restoration
- Scrub Oak Chaparral Restoration
- Southern Mixed Chaparral Restoration
- Vernal Pool Restoration/Enhancement

Priority 3 - Restoration/Enhancement

- Coast Live Oak Woodland Restoration
- Coast Live Oak Woodland Understory Enhancement
- Diegan Coastal Sage Scrub Enhancement

Key Map



Enhancement/Restoration north of the line is an area with very high edge effects and will have a minimal effect on increasing natural history value in the Park.

MATCH TO FIGURE 16A

MATCH TO FIGURE 16A

MATCH TO FIGURE 16C

Vernal Pools

Vernal Pools

Fireway Drive
Marlesta Drive
Genesee Avenue
Boyd Avenue
Mt. Alvarez Avenue
Mt. Acara Drive
Old Bridgeport Way
W. Fox Run Way
Acworth Ave
Mt. Acmar Court
Tamres Drive
Mt. Carol Drive
Mt. Blanca Drive
Mt. Acadia Boulevard
Ulric Street
Comstock Street
Combs Street
Preece Street
Frankel Way
High Knoll Road
Canyon Vista Court
Manning Street
Langmuir Street
Lanston Street
Gifford Way
Kelly Street
Inman Street
Quillan Street
Osler Street
Tahitian Circle
Sendero Way
Opolo Way
Caminito Del Pastel

N E S W

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I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.apr\(Fig 16B) Habitat Restoration

Habitat Restoration and Enhancement Opportunities

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Figure 16B

Priority 1 - Invasive Species Removal

- Category A - 1st Priority
- Category B - 2nd Priority
- Category C - 3rd Priority
- Category D - 4th Priority

Priority 2 - Restoration/Enhancement

- Coast Live Oak Woodland Restoration
- Diegan Coastal Sage Scrub Restoration
- Native Grassland Restoration
- Scrub Oak Chaparral Restoration
- Southern Mixed Chaparral Restoration

Priority 3 - Restoration/Enhancement

- Coast Live Oak Woodland Restoration
- Coast Live Oak Woodland Understory Enhancement
- Diegan Coastal Sage Scrub Enhancement

MATCH TO FIGURE 16B

MATCH TO FIGURE 16A

Mt. Acadia Boulevard
Mt. Blanca Drive
Mt. Brundage Avenue
Mt. Ararat Drive
Mt. Everest Boulevard
Mt. Ashnun Drive
Mt. Armour Drive
Mt. Ariane Drive
Via Carancho
Via Bartolo
Via Bello
Via Aquario
Via Alcazar
Mt. Davis Avenue
Mt. Foster Avenue
Mt. Elbrus Court
Bilbao Avenue
Mt. Casas Drive
Mt. Durban Drive
Mt. Barnard Avenue
Mt. Alifan Drive
Mt. Bigelow Drive
Mt. Almagosa Drive
Mt. Almagosa Place
Mt. Terminus Drive
Mt. Jeffers Avenue
Mt. Lando Drive
Mt. Pumian Avenue
Mt. Hukee Avenue
Mt. Yoss Drive
Mt. Armet Drive
Genesee Avenue
Winnebago Avenue
Chinook Court
Mt. Gaywas Drive
Mt. Lindsey Avenue
Mt. Lindsey Place
Mt. King Drive
Mt. Henry Avenue
Mt. Hillgrinne Place
Mt. Henry Place
Mt. Henry Avenue
Mt. Herbert Avenue
Mt. Forde Avenue
Mt. Hubbard Avenue
Cowley Way
Tomahawk Lane
Dakota Drive
Dalles Avenue
Clairemont Drive
Feather Avenue
Kleefeld Avenue
Vallejo Avenue
Vallejo Court
Miami Court
Miami Way
Cindy Street
Donald Avenue
Rolfe Road
Beri Court
Toch Street
Donald Court
Tolowa Street
Seri Street
Catalinito
Villamar

Key Map

Figure 16C
Figure 16B
Figure 16A

N E S W

800 0 800 Feet

Job No: SDP-04 Date: 12/12/05-EV,RC

I:\ArcGIS\S\SDP-04 Tecolote Canyon\Data\sdp-04.aprx\(Fig 16C) Habitat Restoration

Habitat Restoration and Enhancement Opportunities

TECOLOTE CANYON NATURAL PARK NATURAL RESOURCE MANAGEMENT PLAN

Table 7 (cont.)
INVASIVE SPECIES REMOVAL PRIORITIES

SCIENTIFIC NAME	COMMON NAME
Priority D	
Agave americana	Century plant
Bougainvillea spectabilis	Bougainvillea
Crassula argentea	Jade plant
Dipsacus sativus	Fuller's teaseal
Eugenia aggregata	Cherry of the Rio Grand
Ficus sp.	Fig
Fraxinus uhdei	Evergreen ash
Geranium sp.	Cranesbill
Gladiolus sp.	Gladiola
Olea europea	Olive
Opuntia ficus-indica	Indian fig
Picris echioides	Bristly ox-tongue
Raphanus sativus	Wild radish
Yucca aloifolia	Spanish bayonet

Opportunities for restoration include replacing disturbed habitat, non-native vegetation such as ice plant, or non-native grassland with oak woodland, coastal sage scrub, native grassland or chaparral, as appropriate based on the location, surrounding vegetation, landscape position (i.e., canyon bottoms versus slopes), slope aspect and soils. Other potential habitat restoration/enhancement measures could include enhancing existing vernal pools, improving the understory in existing oak woodlands (which currently is poor) and enhancing disturbed coastal sage scrub. Adding appropriate native species potentially could increase wildlife use of these communities.

In addition to restoring/enhancing vegetation communities, it is recommended that alternatives be considered for improving the ability of wildlife to move through the Canyon. Some of the existing culverts have ponds of water at their outlets, discouraging wildlife movement. Other methods for accommodating wildlife movement across roadways, or methods to improve the function of the existing culverts for this purpose, should be explored.

Restoration and Enhancement Objectives

Replacement of non-native vegetation with native vegetation communities (or, as is more likely in the case of grassland, increasing the native vegetation component in a non-native community) increases the ecological values of the habitat. Native species richness is an important component of ecological value. In general, maximizing the area of native habitats in the canyon increases the stability of the indigenous species' populations. This is because the larger the area, the larger the populations and the less likely they would become extirpated from the Canyon.

Expansion of oak woodlands is considered particularly important because oaks have existed in the canyon for at least hundreds of years. Many of the oldest trees are threatened or have died from the increase from historic water flows that has resulted from urban runoff. This increase in flows has incised the canyon bottom and in some places has resulted in conditions too wet for existing oaks to survive. Facilitating oak recruitment further away from the drainage is therefore important to the continued existence of this community in the Park. This work is considered a lower priority in areas currently supporting non-native grassland, because, although it is not native, this community itself does support some ecological values, such as raptor foraging.

Expansion of coastal sage scrub is important because it is habitat for several sensitive species that currently exist in the Canyon (e.g., coastal California gnatcatcher and orange-throated whiptail). It historically probably comprised the largest area of the canyon, and has been most affected by invasion of non-native vegetation. The disturbed non-native grassland in the southern portion of the Park is currently mapped as future restoration to coastal sage scrub. This area was formerly a dump, however, and has a severely disturbed soil and topographic profile. As a result, further site-specific evaluation is recommended prior to the commencement of restoration activities beyond those already planned in this area (refer to Section 6.2).

Native grasslands currently are very rare in the City, and correspondingly, many grassland species also are very rare. Restoration of the grasslands provides the opportunity to include rare herbaceous species historically known from the area, along with native grass species.

Restoration of southern mixed chaparral and scrub oak chaparral will help restore the historic biodiversity and natural history values of the Park. Restoration of these habitats has been designated in places that likely supported these habitats in the past and are therefore ecologically suited to their reintroduction. Additionally, restoration of scrub oak chaparral will increase the amount of Nuttall's scrub oak, a sensitive species, in the Park.

Vernal pools are an extremely rare habitat type in San Diego County that support a unique flora and fauna. While the two vernal pool complexes that occur within the Park are relatively intact, they have been invaded by non-native grass and forb species, and the pools within and adjacent to the SDG&E right-of-way have been affected by bicycle and vehicular traffic. Enhancement of these pools would preserve the natural history and biological diversity of the Park, and may increase the ability of the pools to support sensitive species. Enhancement/restoration of these areas is only recommended, however, if they can be made defensible (e.g., through the installation of fences).

Restoration and Enhancement Methods

1. Areas suffering from unauthorized public activity should be closed and rehabilitated.

2. Volunteers should be encouraged to participate in restoration and enhancement efforts as part of a neighborhood, community, school, or other organization's activities program. Such volunteers should be trained to distinguish between native and non-native plants, and should be supervised by qualified personnel.

3. Park Rangers should prepare and provide information to volunteers on methods and timing of removal, if requested.

4. To the extent feasible, it is recommended that removal begin upstream and/or upwind and move downstream/downwind to control re-invasion.

5. Because the rate of spread of small satellite populations is generally significantly higher than that of older, larger populations, it is recommended that priority be placed on outlying satellite weed populations in areas with otherwise high biological values, to the extent that this is consistent with the preceding recommendation.

6. Weed removal efforts should, to the maximum extent practical, be timed to minimize dispersal of seeds.

7. Removal activities should not occur during the reproductive seasons of sensitive species in areas where such species may be present (between March 1 and August 15 in coastal sage scrub and between March 15 and September 15 in riparian habitats). In addition, mechanized or other intensive removal activities should not occur within 500 feet of an active nest of a tree-nesting raptor, or within 800 feet of an active nest of a ground-nesting raptor (typically present between February 1 and July 15).

8. The least impactful effective method should be used to remove non-native, invasive species. Impacts to sensitive species/habitats from all restoration/enhancement efforts should be avoided/minimized to the maximum extent practicable.

9. The use of heavy equipment, or any other potentially harmful or impact-causing methodologies, to remove plants may require some level of environmental or biological review and/or supervision to ensure against impacts to sensitive species.

10. If herbicides are determined necessary to eradicate certain species, all safety and environmental regulations (e.g., wearing appropriate protective equipment, following product label directions) must be observed. Spraying may only be undertaken by a state-certified applicator. Only herbicides on the approved Park and Recreation Department Director's List (Appendix F) may be used. A product such as Rodeo® should be used in or near aquatic or wetland areas. Application must not be conducted in windy or rainy weather, and must be conducted in a manner that minimizes overspray onto surrounding plants and contamination of downstream waters. Mixing or diluting of herbicide chemicals must occur within a designated staging area, and no clearing of application equipment or dumping of herbicides is permitted in the Park.

11. Recommendations on non-native, invasive species removal methodologies are available from a variety of sources, including CalIPC, the California Society for Ecological Restoration, the Nature Conservancy, the County of Riverside (for giant reed) and the California Native Plant Society. The appropriate technique, or combination of techniques, will depend on a number of factors, including the species, extent of invasion, adjacency of sensitive resources, and availability of personnel and materials. Recommendations for selected species are as follows:

    a) For extensive patches of grasses and herbs, herbicide should be applied in one of the following manners:

        - Spray seedlings after sufficient rains have fallen in winter and spring and, to the extent possible, prior to the emergence of native species that may be present in the area;

- Spray plants to prevent seed set; and/or
- Use pre-emergent herbicide prior to the first significant rain.

b) For species such as tree tobacco, pampas grass and eucalyptus, treatment may consist of removal of above-ground plant material and stump application (painting with a 50 to 100 percent solution) of an herbicide immediately following cutting.

c) Stump grinding may be useful in the case of large eucalyptus trees.

d) Holes may be drilled in the side of palm trees and herbicide injected directly into their trunks.

e) If seedheads are observed on species such as pampas grass or century plant, they should be bagged to prevent dispersal and cut off.

f) Iceplant should be sprayed with herbicide and left in place, followed by planting of container stock in the dead patches.

12. All plant material removed as part of eradication efforts must be removed from the Park and properly disposed of in a licensed landfill, unless specified otherwise by Open Space staff.

13. Holes and depressions created during removal of individual shrubs or trees must be filled in with surrounding soil and returned to the same grade as the surrounding area.

14. Extra precautions may be required when non-native, invasive species are removed from stream banks, especially if root systems are removed. Removal should take place only at times of lowest flow and no rainfall. Roots should only be removed if necessary to eradicate non-native, invasive species.

15. The need to plant or seed native species in place of removed non-native species should be determined on a case-by-case basis depending upon the type of habitat and the size of the affected area. (Upland areas are more likely to require revegetation than wetland areas, and larger areas more likely than smaller areas.) When planting of native species is determined necessary, it should be undertaken immediately following removal of non-native, invasive species.

16. Plants and seeds used in the revegetation effort should be taken from donor sites in proximity to the restoration site, if feasible. Other donor sites may be approved by the Park and Recreation Department. Nursery stock should not be used.

17. Restoration of grasslands should include rare species historically known from the area (e.g., San Diego goldenstar and San Diego thorn-mint), along with other native forb and grass species (e.g., blue-eyed grass, cryptantha [*Cryptantha muricata*] and needlegrass [*Nassella pulchra* and *Nassella lepida*]).

18. Species appropriate for enhancement of the understory in oak woodlands include poison oak, laurel sumac and basket bush (*Rhus trilobata*).

19. Species appropriate for restoration/enhancement of coastal sage scrub include California sagebrush, California buckwheat, laurel sumac, black sage, lemonadeberry, golden-yarrow (*Eriophyllum confertiflorum*) and needlegrass.

20. Species appropriate for restoration/enhancement of chaparral include scrub oak, chamise, toyon, laurel sumac, black sage, and monkeyflower.

21. Within each vernal pool complex, vernal pool habitat should be reestablished, rehabilitated, and enhanced to historic structure and composition to increase genetic diversity and population stability, provided that access to the complexes can be made secure. Trash should be regularly removed during the dry season. Non-native species should be removed and tire tracks from bicycles and motor vehicles should be smoothed out under the direction of a qualified biologist with experience restoring vernal pools.

22. Areas where restoration and enhancement efforts have been undertaken should be monitored and additional efforts should be undertaken if necessary.

23. Restoration efforts located in proximity to structures should consider future brush management requirements.

9.3 MSCP Target Species Enhancement

For most of the MSCP covered species that are known or considered to have potential to occur in the Park, area-specific management directives focus on protection from edge effects (including impacts such as unauthorized collection and impacts from recreational activities). Protection from edge effects would be addressed through the habitat management measures identified in Section 9.1, above. In particular, fencing should be installed if the Senior Park Ranger determines that it is necessary to protect populations of a sensitive species from impacts. Fencing would be most effective for species with limited distributions in the Park, such as least Bell's vireo or rare plants.

More specific habitat management measures for certain species are as follows:

1. Provide appropriate successional habitat and upland buffers for populations of southwestern willow flycatcher (if any) and least Bell's vireo.

2. Control cowbirds in habitat occupied by southwestern willow flycatcher (if any) and least Bell's vireo, if funding is available and a benefit is foreseen to the resource.

3. Maintain or improve coastal sage scrub habitat quality for coastal California gnatcatcher.

4. Increase populations of wart-stemmed ceanothus, and include the species in chaparral revegetation efforts.

5. Maintain habitat for pollinators surrounding San Diego mesa mint populations (if observed).

6. Implement habitat restoration/enhancement measures in areas occupied by southwestern pond turtle (if any).

Although not specifically recommended by the MSCP, use of MSCP covered species other than wart-stemmed ceanothus, such as San Diego barrel cactus, Shaw's agave, San Diego goldenstar, variegated dudleya, willowy monardella, California adolphia, San Diego sagewort and southwestern spiny rush, in restoration/enhancement programs also is recommended.

The following impact avoidance/minimization measures should be implemented:

1. Avoid clearing of occupied coastal California gnatcatcher habitat and minimize other disturbance to this species during the nesting period (between March 1 and August 15).

2. Undertake any necessary clearing of habitat occupied by least Bell's vireo between September 15 and March 15.

3. Undertake any necessary clearing of habitat occupied by southwestern willow flycatcher (if any) between September 1 and May 1.

4. Establish a 300-foot impact avoidance area around active Cooper's hawk nests (if any, typically present between February 1 and July 15).

5. Establish a 900-foot impact avoidance area around active northern harrier nests (if any, typically present between February 1 and July 15).

6. Establish a 1,500-foot buffer area for habitat occupied by southwestern pond turtle (if any), within which human impacts will be minimized and non-native species detrimental to the turtle will be controlled/removed.

The area-specific management directives for several species address measures to minimize the potential for catastrophic fires, such as controlled burns. As previously discussed, controlled burns are not considered feasible in the Park due to the close proximity of urban development. Other measures to manage vegetation in the Park, beyond thinning within brush management zones, likely are not feasible given available management budgets. Area-specific management directives addressing nest site protection for golden eagle are not applicable because the species is not expected to nest in the Park.

9.4 Improvement of Golf Course Compatibility

Tecolote Canyon Golf Course currently results in impacts to the surrounding habitats such as night lighting (from the driving range) and discharge of herbicides and pesticides into Tecolote Creek. It is recommended that Park and Recreation Department staff coordinate with the golf course operators to encourage them to adopt techniques that would serve to both minimize the impacts of the course on surrounding habitats and increase the value of the golf course as habitat. Voluntary improvements should be strongly encouraged through the end of the current lease in 2022. When the lease is renegotiated, it is recommended that considerations to improve compatibility be incorporated into the lease requirements. An excellent source of information regarding compatibility between golf courses and the natural environment is the Audubon International Cooperative Sanctuary Program for Golf (Audubon International 2003). Examples of potential activities include the following:

1. Direct and shield lights at the driving range to minimize the amount of light shining into the adjacent natural habitat.

2. Designate no-spray zones for chemicals adjacent to Tecolote Creek.

3. Establish an integrated pest management program (including such factors as mowing and irrigation practices, thatch control, traffic control and alternative pest management measures) to minimize the use of chemicals.

4. Reduce the need for irrigation through such practices as fine-tuning irrigation practices, altering horticultural practices (e.g., cutting height, aerification), reducing turf stress, and expanding the use of drought-tolerant plants and mulch.

5. Improve the habitat in all areas of the golf course by removing non-native invasive species and planting/seeding native species.

6. Install boxes for bats and/or cavity-nesting birds.

9.5 Erosion Control Measures

As described in Sections 3.1 and 3.2, erosion and associated sedimentation pose substantial management concerns within the Park. The main goals of efforts to control erosion/sedimentation should be to slow water velocities if possible, to increase infiltration, and to protect the soil against the erosive forces of wind and water with vegetation and/or structural methods. In some cases, measures to address erosion and sedimentation also may be useful in reducing other water pollutants. To the extent feasible, a design that minimizes maintenance requirements and maximizes habitat and aesthetic values, while also sufficiently addressing hydrology and water quality considerations, is preferred. Vegetation is preferred over structural measures where feasible, because it maintains or enhances the biological and aesthetic values of the site and lasts indefinitely with little or no maintenance beyond the initial establishment period. While the use of vegetative measures is preferred, such measures are not always feasible, particularly in areas of high-velocity, concentrated flow. In such cases, vegetation should, whenever feasible, be used in combination with a structural technique.

Due to the fact that nearly 80 storm drains enter Tecolote Canyon, it is not practical to install features such as detention basins at all storm drain outlets to minimize downstream erosion and sedimentation. Discussion in this section is therefore focused on providing solutions in the portions of the Canyon that are most problematic. General guidelines also are provided for addressing other areas as resources are available. The City's Streets Division is responsible for maintaining storm drain outlets.

The rock gabion flow control structure immediately south of the golf course's clubhouse has deteriorated and is in danger of failing during a storm event. Should this occur, it would lead to substantial downstream erosion and sedimentation. It is, therefore, recommended that the gabion be repaired as soon as possible. In addition to the gabion repairs, the Rose and Tecolote Creeks Water Quality Improvement Project Final Planning Report (Rick Engineering Company 2003) identified the potential for an approximately 0.4-acre constructed wetland to be installed immediately upstream of the repaired gabion, along with revegetation of the downstream channel. Although this proposal was ranked second out of 53 potential treatment locations studied in the Tecolote Creek and Rose Creek

watersheds based on potential for physical constructability, accessibility for maintenance, projected reduction in the total suspended solids load, and costs for maintenance and construction, it was not selected as one of the three devices to be implemented by the City under a grant from the State Water Resources Control Board. It is recommended that alternative funding for this proposal be pursued (refer to Chapter 11.0).

One of the portions of the Canyon currently suffering from the most severe erosion damage is the access roadway and adjacent portion of Tecolote Creek below the USD storm drain outlet. Efforts currently are underway to provide permanent stabilization for the roadway in this area. In addition to these efforts, it is recommended that long-term measures to reduce flow velocities and trap sediment and other pollutants be considered in this area. Potential measures include a large detention/sedimentation basin, meandering wetlands or a transpiration/filtration field. The area to the south of the creek in this area primarily supports non-native species, so it represents an ideal location for such features.

A transpiration/filtration field was recommended in this location by Woodward-Clyde Consultants (1986) in their Watershed Management Plan for the Park. The field would primarily consist of a meadow with a small amount of marshland vegetation, riparian trees on the edges and rock dam-like structures at each end. It would simultaneously accomplish the following objectives: reduce flow velocities; increase infiltration; impound some water temporarily; increase the effective holding capacity of part of the watershed; increase water loss to the atmosphere through evapotranspiration; improve water quality by settlement, filtration and biological action; and increase biological diversity by restoring and/or increasing riparian, marshland and aquatic habitat. Additionally, it is expected that the field would be very long-lived, with its effectiveness increasing over time, and would require minimal maintenance. It is recommended that this funding for this proposal be pursued through grant funding, or potentially as mitigation for wetland impacts by other projects (refer to Chapters 8.0 and 11.0). Other locations Woodward-Clyde identified as potentially appropriate for a transpirataion/filtration field are the backwater areas immediately upstream of the culverts at Mount Acadia Boulevard and Balboa Avenue, and the wide area downstream of the box culverts under Genesee Avenue near Marlesta Drive.

Another current problem area consists of an incised tributary canyon to the west of Kelly Street Park. The Friends of Tecolote Canyon have proposed construction of six to eight drop structures to reduce stream slope and creation of approximately 1.6 acres of wetland habitat upstream and downstream of the drop structures to filter runoff in this location. Although this proposal was identified as one of the top eight locations based on physical constructability and maintenance accessibility by the Rick Engineering study, it was not selected for implementation because of its relatively high construction and maintenance costs. It is recommended that alternative designs that may stabilize this and other tributary canyons while resulting in lower construction and maintenance costs be considered. Funding for implementation should be pursued as feasible designs are developed.

General measures/guidelines to minimize erosion and sedimentation issues in the Canyon are as follows (refer to the Watershed Management Plan for additional details):

1. Discharge of water from swimming pools directly into the Canyon is prohibited. Dechlorinated water may be released into existing storm drains. Homeowners on the Canyon rim also should be discouraged from discharging any other concentrated flows into the Canyon.

2. Trails should be designed or (to the extent feasible) modified in accordance with City Trail Standards (City 2004a; Appendix C).

3. Where low-water crossings are necessary, the design section should be (1) capable of adequately supporting the intended traffic (e.g., golf carts versus large maintenance trucks); (2) flexible enough to accommodate minor differential movements that occur in alluvial subgrade soils, while being relatively maintenance-free; (3) pervious to allow groundwater recharge; and (4) capable of safely withstanding the design flow velocities of the Canyon. Measures to moderate flows at water crossings should be incorporated where appropriate.

4. Where utilities have been, or are considered at risk of being, exposed by erosion, it is recommended that they be buried below flexible streambank stabilization measures, such as riprap, gabion baskets or manufactured concrete elements. If the utility is already undermined, bedding material should be replaced below the line prior to placement of the protective structure.

5. Where fill soils are brought in to control areas damaged by past erosion, they should, to the extent feasible, be roughened, minimally compacted and graded to flatter angles to allow for establishment of vegetation.

6. Where streambanks are severely incised and near vertical, they may be cut back to a more stable angle (e.g., 1.5:1 horizontal-to-vertical) and protective measures such as riprap, gabion mattresses or interlocking concrete blocks, all underlain by filter fabric, may be installed.

7. In cases where trees adjacent to the streambank would be lost if the bank were cut back, or the bank is too high to allow for successful flattening, measures to protect the streambank include gabion baskets, flexible concrete revetment, and rock-wire fences. Bank-top trees also should be provided with vertical protection around their roots to prevent further undermining.

8. To slow runoff velocities and reduce soil loss during the early stages of vegetation development, "wattling" is recommended. This technique involves inserting branches of plants (such as willows) into the soil and weaving other branches between them in a basket-like fashion to form a vegetative silt fence.

9. Where large, steep cut slopes exist in the Canyon (such as the steep cut slopes between Balboa Avenue and Mount Acadia Boulevard), small silt fences may be placed on the slopes to slow runoff and trap sediment, allowing vegetation to establish behind them. Such fences may be installed by trained volunteers.

10. Revegetation treatments should be designed on a site-specific basis to produce a vegetation community appropriate to the location. Specifically, the rates and mixtures of species should be designed to mimic natural processes, enhance soil stability and displace non-native, invasive species.

11. Irrigation of restored areas should be minimized as much as possible. It is recognized, however, that temporary irrigation may be appropriate in some circumstances.

12. Areas that have been subject to erosion control efforts should be monitored two to three times per winter, with an additional detailed check at the beginning and end of each rainy season to ensure that they are functioning properly. Prompt corrective action should be taken if needed.

9.6 Cultural Resource Enhancement

It is recommended that, following an inventory of the Park's cultural resources, a Cultural Resource Management Plan be developed to effectively manage the cultural resources within the Park.

10.0 INTERPRETIVE AND RESEARCH GUIDELINES

The Park's natural habitat preserve system provides many interpretive and research opportunities. The following measures are designed to utilize such opportunities in such a way that potential impacts to the Park's sensitive resources are minimized.

10.1 Interpretive and Informational Displays and Programs

1. The sign program in the Park will be consistent with standards set by the Park and Recreation Department.

2. Signs will be placed along the Park's perimeter at public access points. Signs used in the Park's interior will be low maintenance, and will be limited to identifying (1) trails (potentially including trail mile markers) and restoration project sites and (2) Park regulations. Signs should be low-profile to impart information without detracting from the Park's natural setting. No other signs (i.e., educational signs) will be placed within the Park because of past vandalism to signs and other manufactured Park amenities.

3. Signs will utilize the Park's official logo, as appropriate.

4. Signs will be used to identify designated Park entries and boundaries.

5. Signs and kiosks at Park entries and major access points will include the Park's official logo, rules and regulations and any other appropriate information.

6. Signs will be strategically placed to provide a maximum benefit to Park users. Signs will be designed or placed to avoid their use as a perch for foraging raptors in sensitive species nesting areas.

7. Standard informational and educational signs and/or kiosks will be developed for the Park's sensitive habitats and species as well as significant cultural resources sites. Information regarding cultural resources sites will not include the specific location of sites in order to avoid vandalism.

8. Information bulletins, brochures and/or flyers will provide information about the Tecolote Canyon CAC and Friends of Tecolote Canyon and their activities in association with the Park.

9. Signs will be approved by the Open Space Division of the Park and Recreation Department prior to placement at the Park's public access points.

10. Approval by the Senior Park Ranger is required prior to posting notices on bulletin boards at the Nature Center.

11. Interpretive programs for historic resources should be developed and implemented and should include printed materials (if desired) and signs. Such materials are particularly recommended where non-native species (i.e., eucalyptus and apricot trees) have been retained because of their historical significance.

12. Canyon Sewer Watch and volunteer Park patrols that encourage (1) public participation in education and (2) maintenance and protection of resources within the Park should be continued.

10.2 Nature Trails

1. An overall plan for the Park's nature trail system, which would include points of interpretive interest, will be developed by the Park and Recreation Department Open Space Division, in cooperation with the Tecolote Canyon CAC and Friends of Tecolote Canyon.

2. If determined feasible by the Park and Recreation Department Open Space Division Trails Manager or Open Space staff, a nature trail near the Nature Center should be designed for use by individuals that are visually and/or physically handicapped.

3. All nature trails should have a self-guiding trail map/brochure available at the Tecolote Canyon Nature Center. A system of numbered posts corresponding to the interpretive information provided within the booklet should be considered for each trail. The public should be encouraged to return the map/brochure to the nature center for re-use. Trail booklets should include the following information:

   - International signs for hiking and bicycling trails
   - Identification of key plant species
   - Physical descriptions of plant species, growth habits, role in surrounding habitat and uses by wildlife and humans
   - Description of common wildlife behaviors, including feeding, foraging, sleeping and mating
   - Identification of animal tracks
   - Overall discussion of how the habitats in the area function as an ecosystem, such as food webs
   - Historical and cultural facts
   - Discussion of causes of Park resources degradation (including public misuse and overuse, trash, invasive non-native plants, etc.)

4. As appropriate, plastic or metal castings of animals, animal tracks and/or animal droppings and interpretive displays could be located within the Nature Center.

10.3 Interpretive Facilities

The Nature Center provides Park users with educational opportunities to learn about the natural and cultural history of the Park. The Nature Center includes exhibits and a classroom for school field trips and lectures. A native plant garden and Kumeyaay Village adjacent to the Nature Center contribute to educational opportunities within the Park. It is recommended that the Park's staff and volunteers take advantage of the Park's unique position in close proximity to numerous educational institutions to continue and expand its existing environmental and cultural education programs.

The Master Plan identifies locations for secondary self-service kiosks that would contain a weatherproof map and panels with additional Park information. The proposed locations for these visitor centers include the Park access points at Kelly Street Park, Mount Etna Park, North Clairemont Recreation Center, Boyd Avenue, immediately north of Tecolote Canyon Golf Course, Via las Cumbres, and Linda Vista Community Park. Funding and/or donations of labor and materials should be sought to implement these facilities.

Interpretive displays should be changed periodically and provide educational information about the resources and natural systems within the Park, including such topics as prehistoric and historic cultural resources, evapo-transpiration, habitat and plant identification, sensitive species, migratory species, ecosystems, food chains, animal behaviors, species adaptation, water quality and water conservation.

10.4 Research Opportunities

The City encourages research within its resource-based parks and open space. Permission from the City is required to ensure that resources will not be damaged and proposed research projects will not conflict with other projects within the Park. Research proposals for studies to gather unknown information or update existing information on natural and cultural resources will be reviewed by the Natural Resources Manager and Senior Park Ranger. With regard to archaeological research within the Park, the Park and Recreation Department must approve proposals and Native American consultation must occur prior to the initiation of research activities. Any published data must be shared with the Open Space Division of the Park and Recreation Department for inclusion in the Park's research library. Potential funding would come from outside resources, grants or City funds. If City funds are used, the City would ultimately decide which studies to fund. A right-of-entry permit will be issued by the Senior Park Ranger if a research proposal is approved.

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11.0 IMPLEMENTATION

11.1 Federal and State Agency Permits and Agreements

The City will be the lead agency for most projects proposed within the Park boundaries. Federal and state agencies will be notified during the public review process of all proposed projects affecting natural resources that may require state or federal permits. These agencies could include CDFG, USFWS, SWRCB, RWQCB and/or the Corps. MMRPs for individual projects will also be submitted to these agencies for their review.

For some projects within the Park, an entity other than the City may be the lead agency. CDFG will act as the lead agency when a specific permit must be obtained from the agency for streambed alteration or erosion control projects. The Corps will act as the lead agency when a permit must be obtained for possible deposition of fill or dredge material into Waters of the U.S. The lead agency will consult with other resource agencies for review and comment on proposed projects, as appropriate.

11.2 Development Responsibilities

The City's Development Services Department will be responsible for the review of all projects under its jurisdiction to ensure that they comply with the City's development guidelines. In addition, all projects will be subject to the applicable resource agency permits. This agency presents a general summary of the applicable requirements. It will be the responsibility of the City or project applicant to plan, obtain required permits and develop and implement an MMRP.

This NRMP covers four types of possible projects, including: (1) erosion and/or sedimentation control; (2) new Park facilities; (3) Park and utility maintenance activities; and (4) habitat enhancement.

Project Planning

For any erosion control, new facility or maintenance activity that may impact biological and/or cultural resources (including streambed disturbance), a field survey will be conducted of the project site prior to project initiation by a qualified biologist and/or archaeologist (refer to Sections 7.2 and 8.2). The survey(s) will determine the type and extent of impact to biological and/or cultural resources and identify possible mitigation measures, if necessary. If biological resources mitigation is required, a qualified biologist will develop an MMRP for approval by the lead agency and acceptance by the Park and Recreation Department (refer to Section 8.1). Revegetation plans will include the following: (1) a landscape plan that addresses in detail the compensation concept and design criteria; (2) the types and extent of habitats to be revegetated; (3) grading requirements (if any); (4) plants and materials to be used; (5) method of planting; and (6) plans for maintenance and monitoring of the revegetation area. The lead agency will review and approve revegetation plans before project approval is granted. If cultural resources would be impacted, a qualified archaeologist will outline a plan and method(s) for protection and/or salvage and curation of resources, which will be included in the MMRP (refer to Section 8.2).

A binding mechanism will be instituted to ensure that project applicants implement, maintain and monitor all mitigation measures as planned and approved. This mechanism can be a bond or other means of assuring funds will be available to complete project mitigation. In cases where mitigation includes the purchase of habitat from an existing, approved mitigation bank, approval from the City

Development Services Department and other applicable resource agencies and proof of purchase of mitigation credits is required prior to project initiation.

Biological Mitigation and Monitoring

Mitigation programs will be implemented according to the MMRPs preceding or coincident with project construction or maintenance activity. Wherever necessary, exotic or invasive vegetation will be removed and an irrigation plan will be implemented to water plants until they are established. Temporary irrigation should be removed following the plant establishment period.

MMRPs will include a long-term monitoring program to determine the success of the plan and identify maintenance needs. Monitoring will be conducted on a regular basis during a three- to five-year period after implementation of the MMRP. Mitigation sites will be monitored for species' quantitative and qualitative growth. The frequency of monitoring will be determined during the MMRP approval process. An annual monitoring report will be prepared and submitted to the Park and Recreation Department. The report will address plant survival, vegetative cover, the success of establishing designated habitats and recommended actions necessary to accomplish full mitigation. Applicable resource and other agencies will also receive copies of mitigation monitoring reports.

The project applicant will be responsible for maintaining revegetated mitigation sites until mitigation success criteria have been met. Replacement of vegetation and elimination of non-native plant species will be undertaken as part of the mitigation maintenance program. Any planted vegetation that dies or is otherwise damaged within the first few years due to flooding, disease, over- or under-watering, vandalism, etc., will be replaced by the project applicant. Vegetation should be monitored on a regular basis and replaced as needed to fulfill mitigation plan conditions. Non-native plants within mitigation sites should be removed biannually during the three- to five-year maintenance period. Once removed, the plants should be disposed of in a landfill.

After the project construction or maintenance activity is complete, the project area will be surveyed by a qualified biologist and/or archaeologist, as applicable, to ensure the successful implementation of mitigation plan.

11.3 City Responsibilities

The Development Services Department and the Park and Recreation Department Open Space Division are responsible for the administration of the NRMP. The Development Services Department will review all public, private and City development projects under City jurisdiction to determine conformity with the NRMP, City codes and CEQA. The CEQA process will be applied to determine the environmental impacts of proposed projects and identify mitigation measures and alternatives to reduce impacts to the Park's natural and cultural resources.

The Park and Recreation Department is responsible for conducting maintenance, resource management, enhancement and educational activities in the Park in compliance with the NRMP. The Park and Recreation Department will review public and private projects, including revegetation plans and MMRPs, to ensure that they meet the requirements and objectives of the NRMP. The Park and Recreation Department also is responsible for implementation of enhancement and improvement projects and educational programs and maintaining a current database of Park resources. The Open Space Division of the Park and Recreation Department oversees the implementation of the NRMP;

reviews proposed projects and impacts to check for minimization of impacts and compliance with the NRMP; reviews MMRPs and is part of the compliance sign-off for meeting success criteria; issues research and data collection permits (in coordination with the Senior Park Ranger); manages sensitive species and their habitat; and oversees implementation of habitat enhancement and restoration projects.

Park Rangers issue site use permits; coordinate volunteer efforts; provide educational programs; monitor and work to solve erosion problems; oversee trail, sign and fence maintenance and development; provide enforcement of City ordinances; and regularly patrol the Park.

The General Services Department (Streets Division), Water Department and Metropolitan Wastewater Department conduct maintenance activities for their infrastructure within the Park. These maintenance activities will be in compliance with the NRMP, City regulations and CEQA. If emergency work is needed, Park and Recreation staff (e.g., Park Ranger and/or Natural Resource Manager) must be notified in advance of repair work, if possible, or within 24 hours of an emergency repair action of what, why, when and how these repair measures will be or were taken. MMRPs, if necessary, will require a minimum of Park and Recreation (Natural Resource Manager) and Development Services approval prior to implementation, as well as signoff to determine when mitigation criteria are met.

11.4 Tecolote Canyon CAC Responsibilities

The original purpose of the Tecolote Canyon CAC was to develop a proposed master plan for the use, preservation and maintenance of the Park. Its bylaws also state that it is to advise and assist in the implementation of or amendment to the planning of the Park, and to investigate and advise on implementation of the specific goals, standards and recommendations for open space use in the Park. Specifically, the committee makes recommendations on plans for Park facilities development and Park resource enhancement/restoration, as well as commenting on potential environmental impacts to the Park from proposed Park projects and nearby development.

11.5 Community Group Responsibilities

Friends of Tecolote Canyon is a non-profit public interest group whose activities benefit the Park. "Friends" groups are part of the City-community interface. These groups make recommendations to the City on management needs, enhancement and development of City parks and open space. In addition, the following are specific ways the community groups could support the City management of the Park:

1. Conduct fundraising activities for (including grant applications) Park enhancement and education and/or interpretive efforts.

2. Provide volunteers needed for Park improvements, environmental education and some maintenance activities, primarily for seasonal native plant installation and small habitat restoration projects.

3. Advise and assist government agencies, as appropriate, in the preparation, adoption, implementation of or amendment to the planning of the Park.

4. Provide public comments on City or other proposed projects that may affect the Park.

5. Investigate and advise on specific goals, standards and recommendations for open space use in the Park.

6. Notify the Park Rangers of unauthorized activities so that they can provide follow-up enforcement, if necessary.

11.6 Potential Funding Sources

The City's General Fund and volunteer labor by a wide variety of individuals and organizations provide the resources necessary for day-to-day operations of the Park, including many relatively small-scale restoration, enhancement and environmental education efforts. Additional sources of funding may, however, be necessary to implement some of the larger-scale efforts recommended in this NRMP.

Numerous grants are available from federal agencies, state agencies and private foundations to provide assistance with habitat restoration/enhancement, environmental education, water quality improvement and trails construction/restoration. Many of the available grant opportunities can be identified at Cyber-Sierra's Conservation Grants Center (www.conservationgrants.com). A clearinghouse for federal government grants is available at www.grants.gov. A state grant clearinghouse is available at www.getgrants.ca.gov, with more specific information available at various individual agency websites, such as the Wildlife Conservation Board (www.wcb.ca.gov), Parks and Recreation Department (www.parks.ca.gov/default.asp?page_id=1008), Department of Fish and Game (www.dfg.ca.gov/nccp/grants/grants.html) and SWRCB (www.swrcb.ca.gov/funding/index.html). The National Fish and Wildlife Foundation (www.nfwf.org/programs/grant_apply.htm) teams with a variety of governmental agencies and private organizations to provide grants for habitat restoration projects (specifically including management of invasive weeds), native plant conservation efforts, and efforts to protect and enhance the biological resources found on golf courses.

Grants vary in whether they are available to government and/or non-profit organizations. It is, therefore, recommended that the Park and Recreation Department and the Friends of Tecolote Canyon work closely together to identify appropriate grant opportunities. Additionally, because the grants typically have matching requirements, it is recommended that grant opportunities be screened to ensure that adequate matching resources will be available to fulfill grant requirements in any given year.

12.0 ACKNOWLEDGMENTS

TECOLOTE CANYON CITIZENS' ADVISORY COMMITTEE

M. Eloise Battle (Chair)
Karl Anderson, Ph.D.
Adeline Black
Robert Compton
Mike Field
Edward Hatch
Ingrid Lewin
Suzy Ellison-Logan
Robert Mathers
David Potter
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Don Steele
Don Wetzel

FRIENDS OF TECOLOTE CANYON

Carl Miller
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13.0 REFERENCES

_____. 1991. "How to bring a stream back to life; Berkeley and San Diego show how it's done." *Sunset* 186(4): 88-89.

Affinis. 2004. "Archaeological Resources Report, Tecolote Canyon Natural Park, San Diego, California." April.

Audubon International. 2003. "Audubon Cooperative Sanctuary Program (ACSP) for golf." Available at http://www.audubonintl.org/programs/acss/golf.htm.

1996. "A guide to environmental stewardship on the golf course." Audubon Cooperative Sanctuary Programs.

Beebe, F. L. 1974. *Field studies of the Falconiformes of British Columbia.* British Columbia Provincial Museum: 163pp.

Bent, A. C. 1950. *Life histories of North American wagtails, shrikes, vireos, and their allies.* U.S. Natural Museum Bulletin 197. Washington, D.C.: Smithsonian Institution.

Bleich, V. C. 1973. "Ecology of rodents at the United States Naval Weapons Station Seal Beach, Fallbrook Annex, San Diego County, California." M.A. Thesis, California State University, Long Beach. 102 pp.

Bossard, Carla C., John M. Randall, and Marc C. Hoshovsky, eds. 2000. *Invasive plants of California's wildlands.* Berkeley and Los Angeles: University of California Press.

Branchiopod Research Group. 1996. "Vernal pool faunal survey Naval Air Station Miramar." Department of Biology, University of San Diego, San Diego, California.

Brown, H. A. 1967. "Embryonic temperature adaptations and genetic compatibility of two allopatric populations of the spadefoot toad, *Scaphiopus hammondii.*" *Evolution* 21(4): 742-761.

1966. "Temperature adaptation and evolutionary divergence in allopatric populations of the spadefoot toad, *Scaphiopus hammondii.*" Ph.D. Dissertation, University of California, Riverside.

Brown, L. and D. Amadon. 1968. *Eagles, hawks and falcons of the world.* 2 Vols. London: Country Life Books. 945pp.

Brown, L. R. and L. Carpelan. 1971. "Egg hatching and life history of a fairy shrimp *Branchinecta mackini* Dexter (Crustacea: Anostraca) in a Mohave Desert Playa (Rabbit Dry Lake)." *Ecology* 52: 41-54.

Bull, C.S. 1987. "A new proposal: some suggestions for San Diego prehistory." *Casual Papers: Cultural Resource Management* 1(3): 15-64. Cultural Resource Management Center, San Diego State University, San Diego.

California Department of Fish and Game California Natural Diversity Database (CNDDB). 2005. "Special Vascular Plants, Bryophytes, and Lichens List." Quarterly publication, Mimeo. April. 88 pp. Available at http://www.dfg.ca.gov/whdab/pdfs/SPPlants.pdf.

2004. "Special Animals." Biannually publication. August. 48 pp. Available at http://www.dfg.ca.gov/whdab/pdfs/spanimals.pdf.

California Department of Water Resources (DWR). 1975. "California's Groundwater." Bulletin 118. Updated 2003.

California Division of Mines and Geology (CDMG). 1999. "Fault-rupture Hazard Zones in California." Special Publication 42.

1995. "Landslide Hazards in the Southern Part of the San Diego Metropolitan Area, San Diego County, California." Open File Report 95-03.

1994. "Fault Activity Map of California and Adjacent Areas." Geologic Data Map No. 6.

1992. "Peak Acceleration From Maximum Credible Earthquakes in California (Rock and Stiff-soil Sites)." Open File Report 92-1.

1975. "Geology of the San Diego Metropolitan Area, California." Bulletin 200.

California Invasive Plant Council (CalIPC). 1999. "1999 Cal-IPC List." Available at http://groups.ucanr.org/ceppc/1999_Cal-IPC_list.

Call, M. W. 1978. "Nesting habitats and surveying techniques for common western raptors." Technical Note TN-316. U.S. Department of the Interior – Bureau of Land Management, Denver Service Center.

Carrico, R. L. 1993. "Ethnohistoric Period." In *Draft historic properties background study for the City of San Diego clean water program.* Brian F. Mooney Associates, San Diego. pp. V-1—V-24.

1977. "Portolá's 1769 expedition and coastal native villages of San Diego County." *The Journal of California Anthropology* 4(1): 31-41.

Christenson, Lynne. 1994. "Cultural resources of the Los Peñasquitos Preserve."

Davidson, John. 1936. "Tecolote 'large horned owl'." *San Diego Tribune.* January 24.

Deméré, Thomas A., and Stephen L. Walsh. 1994. "Paleontological resources, County of San Diego." San Diego Natural History Museum Department of Paleontology.

Donald, D.B. 1983. "Erratic occurrence of anostracans in a temporary pond: colonization and extinction or adaptation to variations in annual weather?" *Canadian Journal of Zoology* 61: 1492-1498.

Dudek & Associates, Inc. 2003a. "Biological Resources Report and Impact Assessment for the Manning Canyon Emergency Sewer Maintenance and Repair Project, City of San Diego, California." October 31.

2003b. "Biological Resources Report and Impact Assessment for the Mt. Elbrus and Tecolote Canyon Emergency Sewer Repair Project, City of San Diego, California." August 7.

Dunk, J. R. 1995. "White-tailed kite (*Elanus leucurus*)." In *The birds of North America*, No. 178. A. Poole and F. Gill, eds. The Academy of Natural Sciences, Philadelphia and The American Ornithologists' Union, Washington, D.C.

Earth Tech, Inc. 2003. "Biological Resources Report for the Proposed Sewer Canyon Access Project – Tecolote Canyon." January 28.

Ehrlich, P. R., D. S. Dobkin and D. Wheye. 1988. *The birder's handbook: a field guide to the natural history of North American birds*. New York: Simon and Shuster, Inc. 785 pp.

Eng, L. L., D. Belk and C. H. Erickson. 1990. "California Anostraca: distribution, habitat, and status." *Journal of Crustacean Biology* 10(2): 247-277.

Erickson, R. A. 1993. "Pacific pocket mouse (*Perognathus longimembris pacificus*)." Draft manuscript to be included in *Endangered rodents of the world*, to be published by the Species Survival Commission of the International Union for the Conservation of Nature and Natural Resources (IUCN).

Feaver, P. E. 1971. "Breeding pool selection and larval mortality of three California amphibians: *Ambystoma tigrinum californiense* Gray, *Hyla regilla* Baird and Girard, and *Scaphiopus hammondii* Girard." M.A. Thesis, Fresno State College, Fresno, California.

Federal Emergency Management Agency (FEMA). 1997a. Flood Insurance Rate Map (FIRM), Panel No. 06073C1614F. June 19.

1997b. FIRM Panel No. 06073C1618F. June 19.

1997c. FIRM Panel No. 06073C1612F. June 19.

1997d. FIRM Panel No. 06073C1616F. June 19.

1997e. FIRM Panel No. 06073C1604F. June 19.

Federal Interagency Stream Restoration Working Group, The. "Stream corridor restoration: principles, processes, and practices." October.

Federal Register. 1993. "Proposal to list the southwestern willow flycatcher as an endangered species, and to designate critical habitat." U.S. Fish and Wildlife Service. July 23. *Federal Register* 58: 39495-39522.

Fitch, H. S. 1940. "A biogeographical study of the ordinoides artenkreis of garter snakes (genus *Thamnophis*)." *University of California Publications in Zoology* 44: 1-150.

Gallegos, D. 1987. "A review and synthesis of environmental and cultural material for the Batiquitos Lagoon region." In *San Dieguito-La Jolla: Chronology and Controversy*. D. Gallegos, ed. San Diego County Archaeological Society, Research Paper 1. pp. 23-34.

Garrett, K. and J. Dunn. 1981. "Birds of southern California: status and distribution." Los Angeles Audubon Society. 407 pp.

Grinnell, J. and A. H. Miller. 1944. "The distribution of the birds of California." *Pacific Coast Avifauna*. No. 27. Museum of Vertebrate Zoology, University of California, Berkeley.

Hammerson, G. A. 1982. "Amphibians and reptiles in Colorado." Colorado Division of Wildlife Publications. Dow-M-I-27-82: 131.

Hathaway, S. and M. Simovich. Undated. "Some factors affecting the distribution and co-occurrence of two southern California anostracans (Branchiopoda): *Branchinecta sandiegonensis* and *Streptocephalus woottoni*." Biology Department, University of San Diego, California.

Hathaway, S., J. Glaspy, H. Lamberson and M. Simovich. 1992. "The effects of temperature on the distribution and co-occurrences of fairy shrimp (O: Anostraca) in vernal pools in San Diego, California." *American Zoologist Abstracts* 32: 124a.

Hector, S. M. 1986. "Tecolote Canyon archaeological survey." Letter report to Tom Huffman, City of San Diego, from Recon. Report on file at South Coastal Information Center, San Diego State University.

HELIX Environmental Planning, Inc. (HELIX). 2004. Vegetation mapping (including mapping of exotic species), rare plant surveys and bird counts within Tecolote Canyon Natural Park. Spring.

Holland, D. C. 1991. "A synopsis of the ecology and status of the western pond turtle *Clemmys marmorata* in 1991." Report to Natural Ecology Research Center, U.S. Fish and Wildlife Service, San Simeon, CA.

Holland, D. C. and R. H. Goodman, Jr. 1998. "A guide to the amphibians and reptiles of MCB Camp Pendleton, San Diego County, California." Final report prepared for AC/S Environmental Security Resources Management Division under Contract M00681-94-0039.

Holland, R.F. 1986. "Preliminary descriptions of the terrestrial natural communities of California." Nongame-Heritage Program, State of California, Department of Fish and Game, Sacramento. 157 pp.

Holson, J. 2001. "Archaeological survey and records search for IT – San Diego Project (800-08)." Letter report to Polly Quick, IT Corporation, Pacific Legacy Incorporated, Albany, California. Report on file at South Coastal Information Center, San Diego State University.

Jameson, E. W., Jr. and H. J. Peeters. 1988. *California mammals*. Berkeley: University of California Press.

Jennings, M. R. and M. P. Hayes. 1994. "Amphibian and reptile species of special concern in California." Final report submitted to California Department of Fish and Game, Inland Fisheries Division, Rancho Cordova, California, under Contract 8023.

Klauber, L. M. 1972. "Rattlesnakes: their habits, life histories, and influence on mankind." Second edition. Berkeley, Los Angeles, London: University of California Press.

Kosits, Rusty. Undated. "The history of Tecolote Canyon." Unpublished manuscript, on file at Affinis.

Krapu, G. L. 1974. "Foods of breeding pintails in North Dakota." *Journal of Wildlife Management* 38(3): 408-417.

La Rue, Steve. 1997. "Trash of 1870s becomes archaeological treasure of today in a Tecolote discovery." *San Diego Union-Tribune.* June 23.

Lau, Angela. 2004. "Apartment dispute near boiling point." *San Diego Union-Tribune.* March 20.

Leonard, Deborah. 2001. Personal observation. Biologist, HELIX Environmental Planning, Inc.

Luomala, K. 1978. "Tipai-Ipai." In *California.* R.F. Heizer, ed. *The handbook of North American Indians*, vol. 8, W.C. Sturtevant, general editor. Washington, D.C.: Smithsonian Institution. pp. 592-609.

McGahan, Jerry. 1968. "Ecology of the golden eagle." *The Auk* 85(1): 1-12.

MEC Analytical Systems, Inc. (MEC). 2003. "San Diego County Municipal Copermittees 2001-2002 urban runoff monitoring final report." Volume I. January.

MEC Analytical Systems, Inc. (MEC) (cont.)
2001. "San Diego region previous storm water monitoring review and future recommendations final report." August 20.

Merkel & Associates. 2004. "Conceptual Mitigation Plan for the Canyon Sewer Projects Within the Tecolote Canyon Natural Preserve, City of San Diego, Metropolitan Wastewater Department." October 27, revised December 24.

Metropolitan Water District and Riverside County Habitat Conservation Agency. 1995. "Lake Mathews Multiple Species Habitat Conservation Plan and Natural Community Conservation Plan." Volume 2.

Olendorff, R. R. 1976. "The food habits of North American golden eagles." *American Midland Naturalist* 95: 231-236.

Park and Recreation Department, City of San Diego and Merkel and Associates. 2002. "Draft Western Otay Valley Regional Park Natural Resource Management Plan." November.

Parker, V. 1984. "Correlation of physiological divergence with reproductive mode in chaparral shrubs." *Madrono* 31(4): 231-242.

Pennak, R. 1989. *Fresh-Water invertebrates of the United States: Protozoa to Mollusca.* 3rd edition. New York: A Wiley-Interscience Publication.

Price, M. V. and N. M. Waser. 1984. "On the relative abundance of species: postfire changes in a coastal sage scrub rodent community." *Ecology* 65: 1161-1169.

Reiser, Craig H. 2001. *Rare plants of San Diego County.* Imperial Beach, CA: Aquafir Press. 244 pp. plus appendix.

Rick Engineering Company, Water Resources Division. 2003. "Rose and Tecolote Creeks Water Quality Improvement Project Final Planning Project." Prepared for City of San Diego Storm Water Pollution Prevention Program. August 15.

Riley, Ann L. 1998. *Restoring streams in cities: a guide for planners, policymakers, and citizens.* Washington, D.C.: Island Press.

Robbins-Wade, M. 1988. "Coastal Luiseño: refining the San Luis Rey Complex." *Proceedings of the Society for California Archaeology, Fresno, California* 1: 75-95.

1986. "Rising glen: SDM-W-143/146 (SDI-5213 C & D)." *Casual Papers* 2(2): 37-58. Cultural Resource Management Center, San Diego State University, San Diego.

Rogers, M. J. 1966. *Ancient hunters of the far west.* San Diego: Union-Tribune Publishing Company. 208 pp.

Rosen, P. C., S. S. Sartorius, C. R. Schwalbe, P. A. Holm, and C. H. Lowe. 1996. "Herpetology of the Sulphur Springs Valley, Cochise County, Arizona." In *The future of arid grasslands: identifying issues, seeking solutions, 9-13 October 1996, Tucson, Arizona. Proceedings RMRS-P-3.* B. Tellman, D. M. Finch, C. Edminster and R. Hamre, eds. 1998. pp. 65-80. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.

Rossman, D. A., N. B. Ford and R. A. Seigal. 1996. *The garter snakes: evolution and ecology. Animal and Natural History Series 2.* Norman, OK: University of Oklahoma Press. pp. 194-197.

Rundel, P. 1986. "Structure and function in California chaparral." *Fremontia* 14(3): 3-10.

San Diego, City of. 2004a. "Trail Standards." Prepared by the Park and Recreation Department Open Space Division. Revised December.

San Diego, City of (cont.)

2004b. Coastal Development Permit No. 13506/Site Development Permit No. 13507: Canyon Sewer Cleaning Program and Long Term Sewer Maintenance Program [MMRP] Planning Commission. August 26.

2004c. Transmission of water quality data via e-mail from Ms. Ruth Kolb, City of San Diego Storm Water Program, to Mr. Dennis Marcin, HELIX Environmental Planning, Inc. January 30.

2003a. "Canyon Sewer Cleaning Program and Long-term Sewer Maintenance Program: Final Program Environmental Impact Report." December 2003.

2003b. "Draft Mitigated Negative Declaration: Clairemont Village." November 11.

2003c. "Mission Bay and La Jolla Watersheds Urban Runoff Management Plan." January.

2001. San Diego Municipal Code, Land Development Code, Biology Guidelines. May 19.

1998. "Linda Vista Community Plan." December 1.

1997. "City of San Diego Multiple Species Conservation Program (MSCP) Subarea Plan." March.

1996. "Biological Monitoring Plan for the Multiple Species Conservation Program." January 25.

1990. "Clairemont Mesa Community Plan." September 26, as amended May 4, 1998.

1987. "Tecolote Canyon Rim Development Guidelines." January 13.

1979. "Progress Guide and General Plan." As amended 1989.San Diego County Water Authority (SDCWA). 1997. "San Diego County Water Authority Groundwater Report." June.

San Diego Gas & Electric (SDG&E). 1995. "SDG&E Subregional Natural Community Conservation Plan."

San Diego Natural History Museum. Undated. "Breeding bird species accounts." Available at http://www.sdnhm.org/research/birdatlas/species-accounts.html.

San Diego Regional Water Quality Control Board (RWQCB). 2002. "2002 Biological Assessment Report."

2001. "2001 Biological Assessment Report."

1999. "Biological Assessment Annual Report."

San Diego Regional Water Quality Control Board (RWQCB). (cont.)
1994. "Water Quality Control Plan for the San Diego Basin (Basin Plan)." September 8, amended through July 2003.

Sferra, S. J., T. E. Corman, C. E. Paradzick, J. W. Rourke and J. A. Spencer. 1997. "Arizona Partners in Flight Southwestern willow flycatcher: 1993-1996 summary report." Technical Report 113. Nongame and Endangered Wildlife Program, Arizona Game and Fish Department, Phoenix, AZ.

Simovich, M. 1990. "Sensitive faunal elements of the vernal pools of Otay Ranch." A Report to Michael Brandman and Associates. Biology Department, University of San Diego. May 16.

Simovich, M. and S. Hathaway. Undated. "Reproductive strategies of anostracans in unpredictable environments." Biology Department, University of San Diego, San Diego, California.

Shipek, F.C. 1970. *The autobiography of Delfina Cuero, a Dieguiño Indian, as told to Florence C. Shipek.* Morongo Indian Reservation, California: Malki Museum Press.

Smithsonian National Zoological Park. 2004. "Fact sheets: African clawed frog." Available at http://nationalzoo.si.edu/Animals/ReptilesAmphibians.

Sogge, Mark K., Robert M. Marshall, Susan J. Sferra and Timothy J. Tibbitts. 1997. "A southwestern willow flycatcher natural history summary and survey protocol." Technical Report NPS/NUACPRS/NRTR-97/12. May.

State Water Resources Control Board (SWRCB). 2003. "2002 CWA Section 303(d) List (California 303[d] list) of water quality limited segments for California." SWRCB Resolution dated February 4, approved by U.S. Environmental Protection Agency in July.

2001. "California Ocean Plan." Adopted by the SWRCB on November 16, 2000, approved by the U.S. Environmental Protection Agency on December 3, 2001.

Stebbins, R. C. 1985. *A field guide to the western reptiles and amphibians.* 2nd Edition. Boston: Houghton Mifflin. pp. xiv +279.

1954. *Amphibians and reptiles of western North America.* New York: McGraw-Hill Book Company. 537 pp.

Swanson, G. A., M. I. Meyer and J. R. Serie. 1974. "Feeding ecology of breeding blue-winged teals." *Journal of Wildlife Management* 38: 396-407.

Tecolote Canyon Citizens Advisory Committee. 1982. "Tecolote Canyon Natural Park Master Plan." December.

Tierra Environmental Services. 2004. "Biological Resources Report & Impact Assessment for the East Clairemont Segment Tecolote Canyon Emergency Sewer Repairs, City of San Diego, California; Project No. 6020." January 27.

True, D. L. 1970. "Investigation of a Late Prehistoric Complex in Cuyamaca Rancho State Park, San Diego County, California." *University of California, Los Angeles, Archaeological Survey Monographs I.* University of California, Los Angeles.

Unitt, P. 1984. *The birds of San Diego County.* San Diego Society of Natural History: Memoir 13, San Diego, California. 276 pp.

U.S. Geological Survey (USGS). 1980. "Quality of urban runoff, Tecolote Creek drainage area, San Diego County, California." *Water-Resources Investigations* 80-70. September.

U.S. Geological Survey, Southwest Biological Science Center. 2005. "Southwestern willow flycatcher habitat – characteristics and examples." Available at http://www.usgs.nau.edu/swwf/wiflhab.html.

U.S. Soil Conservation Service (SCS). 1973. "Soil Survey, San Diego Area, California." December.

Warren, C. N. 1967. "The San Dieguito Complex: a review and hypothesis." *American Antiquity* 32: 168-185.

Whitfield, M. J. 1997. Personal communication. Research Associate, Kern River Research Center. In "A southwestern willow flycatcher natural history summary and survey protocol." Sogge, Mark K., Robert M. Marshall, Susan J. Sferra and Timothy J. Tibbitts. Technical Report NPS/NUACPRS/NRTR-97/12. May.

Williams, Jack. 2004. "Manual Pena, 93; once ran family's Bay Park ranch." *San Diego Union-Tribune.* May 14.

Winterrowd, C. L., and D. S. Cárdenas. 1987. "An archaeological indexing of a portion of the Village of La Rinconada de Jamo SDI-5017 (SDM-W-150)." RBR & Associates, Inc., San Diego. Report on file at South Coastal Information Center, San Diego State University.

Woodward-Clyde Consultants. 1986. "Tecolote Canyon Natural Park Watershed Management Concept, San Diego, California." September 15.

1983. "Watershed Erosion/Sedimentation Studies: Tecolote Canyon Natural Park, San Diego, California." October 20.

Yosef, R. 1996. "Loggerhead shrike (*Lanius ludovicianus*)." In *The birds of North America.* A. Poole and F. Gill, eds. No. 231. The Academy of Natural Sciences, Philadelphia and The American Ornithologists' Union, Washington, D.C.

Zedler, P., Chris Frazier, Elaine Corets, and Charles Black. 1990. "Biological studies and management recommendations for the Skunk Hollow Vernal Pool, Riverside County, California." Prepared for Lane Kuhn Pacific Communities. August 15.

Zeiner, D. C., W. F. Laudenslayer, Jr. and K. E. Mayer, eds. 1988. *California's wildlife – Volume 1: amphibians and reptiles.* California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game. Sacramento, California. 272 pp.

Zeiner, D.C. and M. White, eds. 1990a. *California's wildlife – Volume 2: birds.* State of California, Department of Fish and Game. Sacramento, California. 731 pp.

1990b. *California's wildlife – Volume 3: mammals.* State of California, Department of Fish and Game. Sacramento, California. 407 pp.

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APPENDIX A

PLANT SPECIES OBSERVED IN THE TCNP NRMP AREA

ANIMAL SPECIES OBSERVED IN THE TCNP NRMP AREA

EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

APPENDIX A
PLANT SPECIES OBSERVED IN THE TCNP NRMP AREA

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS		
Aizoaceae – Carpet-weed Family		
Carpobrotus edulis	hottentot-fig*	A, C, D, E, G, J
Delosperma vinaceum	iceplant*	C
Malephora crocea	croceum iceplant*	G
Mesembryanthemum crystallinum	crystalline iceplant*	A, C, G, J
Mesembryanthemum nodiflorum	slender-leaved iceplant*	G
Mesembryanthemum sp.	iceplant*	G
Anacardiaceae – Sumac Family		
Malosma laurina	laurel sumac	A, B, C, D, E, G, J
Rhus integrifolia	lemonadeberry	A, B, C, D, E, G, J
Rhus ovata	sugar bush	D
Schinus molle	Peruvian pepper tree*	C, D, G
Schinus terebinthifolius	Brazilian pepper tree*	D, E, G, J
Toxicodendron diversilobum	poison oak	A, B, D, E, G, J
Apiaceae – Carrot Family		
Apiastrum angustifolium	mock parsley	C
Apium graveolens	celery*	D, G, J
Conium maculatum	common poison hemlock*	A, C, E, G
Foeniculum vulgare	fennel*	A, B, C, D, E, G, J
Apocynaceae – Dogbane Family		
Nerium oleander	oleander*	C
Vinca major	greater periwinkle*	G
Araliaceae – Ginseng Family		
Hedera helix	English ivy*	E, G
Asclepiadaceae – Milkweed Family		
Asclepias californica	California milkweed	A
Asteraceae – Sunflower Family		
Achillea millefolium	Pacific yarrow	C
Ambrosia acanthicarpa	annual bur-sage	G
Ambrosia confertiflora	weak-leaf burbush	G
Ambrosia psilostachya	western ragweed	C, D, E, G, J
Artemisia californica	California sagebrush	A, B, C, D, E, G, J

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Asteraceae – Sunflower Family (cont.)		
Artemisia douglasiana	mugwort	C, J
Artemisia palmeri	San Diego sagewort†	B, C, D, E, G, J
Baccharis pilularis	coyote brush	A, C, D, E, G, J
Baccharis salicifolia	mule fat	A, B, C, D, E, G, J
Baccharis sarothroides	broom baccharis	A, B, C, D, E, G, J
Carduus pycnocephalus	Italian thistle*	G
Centaurea melitensis	star thistle*	C, D, E, G, J
Chaenactis glabriuscula var. *glabriuscula*	yellow pincushion	G
Chamomilla suaveolens	pineapple weed*	C
Chrysanthemum coronarium	garland*	C, D, E, G, J
Cirsium vulgare	bull thistle*	C, J
Conyza bonariensis	flax-leaf fleabane*	J
Conyza canadensis	horseweed*	D, E, J
Cotula australis	Australian brass-buttons*	C, G
Cotula coronopifolia	African brass-buttons*	G
Deinandra [*Hemizonia*] *fasciculata*	fascicled tarplant	G, J
Encelia californica	California encelia	A, C, D, E, G
Eriophyllum confertiflorum	golden-yarrow	A, C, G
Filago sp.	filago	G
Gnaphalium bicolor	bicolor cudweed	C, G, J
Gnaphalium californicum	California everlasting	A, C, G, J
Gnaphalium canescens ssp. *microcephalum*	white everlasting	G
Gnaphalium luteo-album	everlasting*	E
Gnaphalium sp.	cudweed	A
Gutierrezia californica	California matchweed	C
Hazardia squarrosa var. *grindelioides*	saw-toothed goldenbush	A, C, E, G
Hedypnois cretica	Crete hedypnois*	G
Heterotheca grandiflora	telegraph weed	A, C, D, G
Hypochaeris glabra	smooth cat's-ear*	C, E, G
Isocoma menziesii var. *menziesii* [*Haplopappus venetus*]	San Diego goldenbush	A, D, G
Isocoma menziesii var. *vernonioides*	coastal goldenbush	E, G, J
Lactuca serriola	wild lettuce*	C, G, J
Layia platyglossa	tidy-tips	A
Lessingia filaginifolia	California-aster	E, G
Lessingia glandulifera	valley lessingia	B
Osmadenia tenella	osmadenia	G
Palafoxia arida var. *arida*	Spanish-needle	G
Picris echioides	bristly ox-tongue*	E, G
Pluchea odorata	salt marsh fleabane	B
Psilocarphus brevissimus var. *brevissimus*	dwarf wooly-heads	G
Psilocarphus tenellus	slender woolly-heads	G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Asteraceae – Sunflower Family (cont.)		
Senecio vulgaris	common groundsel*	C
Silybum marianum	milk thistle*	E
Solidago californica	California goldenrod	E, G
Sonchus arvensis	perennial sow thistle*	A, G
Sonchus asper	prickly sow thistle*	C, E, G
Sonchus oleraceus	common sow thistle*	A, C, E, G
Stephanomeria sp.	stephanomeria	A
Stephanomeria virgata	virgate wreath plant	G
Taraxacum officinale	common dandelion*	C
Viguiera laciniata	San Diego sunflower/ San Diego County viguiera†	A, D, G
Xanthium strumarium	cocklebur	A, C, D, E, G, J
Boraginaceae – Borage Family		
Amsinckia menziesii	rancher's fiddleneck	C
Cryptantha intermedia	nievitas	A, C, G
Cryptantha muricata	cryptantha	C
Echium candicans	Pride of Madeira*	C
Heliotropium curassavicum	salt heliotrope	G
Plagiobothrys collinus var. *californicus*	popcorn flower	C, E
Plagiobothrys collinus var. *gracilis*	San Diego popcorn flower	G
Brassicaceae – Mustard Family		
Alyssum sp.	alyssum*	G
Brassica nigra	black mustard*	B, D, E, G
Brassica rapa	field mustard*	C, E
Brassica sp.	mustard*	A, G
Hirschfeldia incana	perennial mustard*	C, G, J
Lepidium lasiocarpum	sand peppergrass	G
Lepidium nitidum	shining peppergrass	C
Lobularia maritima	sweet alyssum*	C, E
Raphanus sativus	wild radish*	A, C, E, G
Rorippa nasturtium-aquaticum	water cress	C
Sisymbrium altissimum	tumble mustard*	G
Sisymbrium irio	London rocket*	C, G
Cactaceae – Cactus Family		
Ferocactus viridescens	San Diego barrel cactus†	G
Opuntia ficus-indica	Indian-fig*	C, G
Opuntia littoralis	coastal prickly pear	C, D, E, G, J
Opuntia occidentalis	prickly pear	A, G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Cactaceae – Cactus Family (cont.)		
Opuntia prolifera	coastal cholla	A, C, E, G, J
Opuntia sp.	cholla	D
Callitrichaceae – Water Starwort Family		
Callitriche marginata	long-stalk water-starwort	G
Capparaceae – Caper Family		
Isomeris arborea	bladderpod	A, C, D, E, G, J
Caprifoliaceae – Honeysuckle Family		
Lonicera subspicata	southern honeysuckle	A, D, G
Lonicera subspicata var. *denudata*	San Diego honeysuckle	C, G
Sambucus mexicana	blue elderberry	A, C, D, E, G, J
Caryophyllaceae – Pink Family		
Cardionema ramosissimum	tread-lightly	G
Silene gallica	common catchfly*	C
Chenopodiaceae – Goosefoot Family		
Atriplex semibaccata	Australian saltbush*	B, C, D, G
Atriplex sp.	saltbush	A
Chenopodium album	pigweed*	D
Chenopodium californicum	California pigweed	E
Chenopodium murale	nettle-leaf goosefoot*	A, C, G
Salsola tragus [*S. iberica*]	Russian thistle*	A, C, D, E, G, J
Cistaceae – Rock-rose Family		
Helianthemum scoparium	peak rush rose	G
Convolvulaceae – Morning-glory family		
Calystegia macrostegia	morning-glory	A, D, G
Convolvulus arvensis	bindweed*	C
Crassulaceae – Stonecrop Family		
Aeonium arboreum	aeonium*	E
Crassula argentea	jade plant*	C, G
Dudleya edulis	ladies-fingers	G
Dudleya pulverulenta	chalk lettuce	C, G
Crassula aquatica	water pygmy weed	G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Cucurbitaceae – Gourd Family		
Cucurbita palmata	coyote melon	D
Marah macrocarpus	wild cucumber	A, C, E
Crassula connata	pygmy weed	G
Cuscutaceae – Dodder Family		
Cuscuta sp.	dodder	A, G
Dipsacaceae – Teasel Family		
Dipsacus fullonum	wild teasel*	D
Dipsacus sativus	Fuller's teasel*	E, G
Dipsacus sp.	teasel*	A
Ericaceae – Heath Family		
Xylococcus bicolor	mission manzanita	A, E, G
Euphorbiaceae – Spurge Family		
Chamaesyce albomarginata	rattlesnake spurge	C
Chamaesyce maculata	spotted spurge	E
Chamaesyce polycarpa [*Euphorbia polycarpa*]	desert sand mat*	A, G
Croton californicus	croton	C
Eremocarpus setigerus	dove weed	D, G
Euphorbia crenulata	Chinese caps	E
Euphorbia peplus	petty spurge*	A, C, G
Ricinus communis	castor bean*	A, C, D, E, G, J
Fabaceae – Legume Family		
Acacia baileyana	Cootamundra wattle*	E
Acacia longifolia	golden wattle*	C, G
Acacia sp.	acacia*	A, D
Astragalus sp.	raffleweed, locoweed	A, D, E
Astragalus trichopodus	ocean locoweed	C, G
Lathyrus latifolius	perennial sweet pea*	E, G
Lathyrus sp.	pea	A
Lotus scoparius var. *scoparius*	coastal deerweed	A, C, D, E, G
Lotus strigosus	Bishop's lotus	C
Lupinus bicolor	miniature lupine	C
Lupinus succulentus	arroyo lupine	C, E
Lupinus sp.	lupine	G
Medicago polymorpha	bur-clover*	A, E
Medicago sativa	alfalfa*	C

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Fabaceae – Legume Family (cont.)		
Melilotus alba	white sweetclover*	A, B, D, J
Melilotus indica	Indian sweet clover*	A, G, J
Melilotus sp.	sweetclover*	E, G
Robinia idahoensis	Idaho locust*	G
Trifolium fragiferum	strawberry clover*	C
Trifolium willdenovii	tomcat clover	G
Fagaceae – Beech Family		
Quercus agrifolia var. *agrifolia*	coast live oak	A, B, C, D, E, G, J
Quercus berberidifolia	scrub oak	C
Quercus dumosa	Nuttall's scrub oak†	A, B, G
Quercus sp.	oak	D
Gentianaceae – Gentian Family		
Centaurium venustum	canchalagua	A, G
Geraniaceae – Geranium Family		
Erodium botrys	long-beak filaree*	E
Erodium cicutarium	red-stem filaree*	A, C, E, G
Erodium moschatum	green-stem filaree*	G
Geranium molle	dove-foot geranium*	C
Geranium sp.	geranium*	G
Grossulariaceae – Currant Family		
Ribes sp.	gooseberry	D, G
Ribes speciosum	fuschia-flowered gooseberry	A, C, E, G, J
Hamamelidaceae – Witch-hazel Family		
Liquidambar sp.	sweetgum*	D
Hydrophyllaceae – Waterleaf Family		
Eriodictyon crassifolium	felt-leaved yerba santa	C, E, G
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	common eucrypta	C
Phacelia tanacetifolia	wild canterbury-bells	E
Hypericaceae – St. John's Wort Family		
Hypericum canariense	Canary Island hypericum*	C

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Lamiaceae – Mint Family		
Marrubium vulgare	horehound*	A, C, D, E, G, J
Pogogyne abramsii	San Diego mesa mint†	F
Salvia apiana	white sage	A, C, D, E, G
Salvia mellifera	black sage	A, C, D, E, G
Malvaceae – Mallow Family		
Malacothamnus densiflorus	bush mallow	C
Malacothamnus fasciculatus	chaparral mallow	A, D, E, G, J
Malva nicaeensis	bull mallow*	G
Malva parviflora	cheeseweed*	A, C, D, E, G
Sidalcea malviflora ssp. *sparsifolia*	checker-bloom	A, C, G
Sphaeralcea ambigua	apricot mallow	A
Moraceae – Mulberry Family		
Ficus sp.	ficus*	G
Myoporaceae – Myoporum Family		
Myoporum laetum	myoporum*	C, E, G, J
Myrtaceae – Myrtle Family		
Eucalyptus globulus	blue gum*	C
Eucalyptus sp.	eucalyptus*	A, D, G, J
Eugenia aggregata	cherry of the Rio Grande*	G
Nyctaginaceae – Four O'Clock Family		
Bougainvillea spectabilis	bougainvillea*	G
Mirabilis californica	wishbone bush	A, C
Oleaceae – Olive Family		
Fraxinus uhdei	evergreen ash*	E, G
Fraxinus sp.	ash*	D
Olea europaea	olive*	D, E, G
Onagraceae – Evening Primrose Family		
Camissonia bistorta	California sun cup	C, G
Camissonia californica	false mustard	C
Camissonia sp.	sun cup	A
Epilobium canum ssp. *canum* [*Zauscherina californica*]	California fuchsia	A, G
Gaura sinuata	wavy-leaved gaura*	A, G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Onagraceae – Evening Primrose Family		
Oenothera elata	great marsh evening-primrose	G, J
Oxalidaceae – Oxalis Family		
Oxalis pes-caprae	Bermuda buttercup*	E, G
Oxalis sp.	oxalis*	G
Papaveraceae – Poppy Family		
Eschscholzia californica	California poppy	C
Plantaginaceae – Plantain Family		
Plantago elongata	plantain	G
Plantago erecta	dwarf plantain	C, G
Plantago lanceolata	English plantain*	G
Plantago major	common plantain*	G, J
Platanaceae – Sycamore Family		
Platanus racemosa	western sycamore	A, B, C, D, E, G, J
Plumbaginaceae – Leadwort Family		
Limonium perezii	statice*	C
Polemoniaceae – Phlox Family		
Linanthus dianthiflorus	ground pink	A
Navarretia hamata	skunkweed	G
Polygonaceae – Buckwheat Family		
Chorizanthe fimbriata	fringed spineflower	G
Chorizanthe staticoides	Turkish rugging	G
Eriogonum fasciculatum ssp. *fasciculatum*	California buckwheat	A, B, C, D, E, G
Eriogonum fasciculatum var. *foliolosum*	interior flat-top buckwheat	J
Polygonum arenastrum	common knotweed*	E
Polygonum lapathifolium	willow weed	G
Rumex crispus	curly dock*	A, C, D, E, G, J
Portulacaceae – Purslane Family		
Calyptridium monandrum	sand-cress	C
Claytonia perfoliata var. *perfoliata*	miner's lettuce	C
Portulaca oleracea	common purslane*	E

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Primulaceae – Primrose Family		
Anagallis arvensis	scarlet pimpernel*	A, C, E, G, J
Dodecathecon clevelandii	shooting star	A
Ranunculaceae – Buttercup Family		
Clematis pauciflora	ropevine	G
Rhamnaceae – Buckthorn Family		
Ceanothus verrucosus	wart-stemmed ceanothus†	E
Rhamnus crocea	spiny redberry	D, E, G
Rosaceae – Rose Family		
Adenostoma fasciculatum	chamise	A, C, G
Heteromeles arbutifolia	toyon	A, B, C, D, E, G, J
Prunus fremontii	desert apricot	G
Prunus persica	peach*	E
Rosa californica	California rose	A, D, G, J
Rubiaceae – Madder Family		
Galium sp.	bedstraw	G
Salicaceae – Willow Family		
Populus fremontii ssp. *fremontii*	Fremont's cottonwood	C, G, J
Salix gooddingii	Goodding's black willow	E, G
Salix laevigata	red willow	D
Salix lasiolepis	arroyo willow	A, B, C, D, E, G, J
Salix lucida ssp. *lasiandra*	shining willow	E, J
Salix sp.	willow	G
Sapindaceae – Soapberry Family		
Cupaniopsis anacarioides	carrotwood*	E
Saururaceae – Lizard's Tail Family		
Anemopsis californica	yerba mansa	D
Scrophulariaceae – Figwort Family		
Antirrhinum sp.	snapdragon	A
Castilleja densiflora	owl's clover	A
Linaria canadensis	large blue toadflax	G
Mimulus aurantiacus	monkey-flower	A, C, D, E, G, J

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
DICOTS (cont.)		
Simaroubaceae – Quassia or Simarouba Family		
Ailanthus altissima	tree of heaven*	A, E
Simmondsiaceae – Jojoba Family		
Simmondsia chinensis	jojoba	A, E
Solanaceae – Nightshade Family		
Datura wrightii	jimson weed, thorn-apple	A, D, G
Nicotiana glauca	tree tobacco*	A, C, D, E, G, J
Solanum douglasii	white nightshade	A, G, J
Solanum xanti	purple nightshade	A, C
Tamaricaceae – Tamarisk Family		
Tamarix ramosissima	French tamarisk*	C, G
Urticaceae – Nettle Family		
Urtica dioica	stinging nettle	C, G
Urtica urens	dwarf nettle*	G
Verbenaceae – Vervain Family		
Verbena menthifolia	verbena	G
Verbena sp.	verbena	A
Verbena lasiostachys var. *lasiostachys*	western vervain	J
PTERIDOPHYTES		
Polypodiaceae – Polypody Family		
Polypodium californicum	California polypody	G
Selaginellaceae – Spike-moss family		
Selaginella cinerascens	ashy spike-moss	G
GYMNOSPERMS		
Pinaceae – Pine Family		
Pinus attenuata	knobcone pine*	C
Pinus muricata	Bishop pine*	D
Pinus radiata	Monterey pine*	E
MONOCOTS		
Agavaceae – Agave family		
Agave americana	century plant/ American agave*	A, D, E, G
Agave shawii	Shaw's agave†	C
Agave sp.	agave	G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
MONOCOTS (cont.)		
Arecaceae – Palm family		
Phoenix canariensis	Canary Island date palm*	D, E, G, J
Washingtonia filifera	California fan palm	J
Washingtonia robusta	Mexican fan palm*	B, D, E, G
Asparagaceae – Asparagus family		
Asparagus asparagoides	florist's smilax/ smilax asparagus*	C, E, G
Asphodelaceae – Asphodel family		
Asphodelus fistulosus	hollow-stem asphodel*	C, E, G, J
Cyperaceae – Sedge Family		
Cyperus eragrostis	tall flatsedge	J
Cyperus esculentus	yellow nutsedge	E
Cyperus involucratus	umbrella plant*	E
Cyperus sp.	umbrella sedge	D, G
Eleocharis macrostachya	pale spike-rush	G
Eleocharis montevidensis	Dombey's spike-sedge	J
Eleocharis sp.	spike-rush	G
Scirpus acutus var. *occidentalis*	tule	G
Scirpus sp.	bulrush	A, G
Iridaceae – Iris Family		
Chasmanthe floribunda	African corn flag*	G
Sisyrinchium bellum	blue-eyed grass	A, C, G
Juncaceae – Rush Family		
Juncus acutus ssp. *leopoldii*	southwestern spiny rush†	A, G
Juncus bufonius	toad rush	G, J
Juncus sp.	rush	C
Liliaceae – Lily Family		
Brodiaea orcuttii	Orcutt's brodiaea†	F
Calochortus sp.	mariposa lily	A
Chlorogalum pomeridianum	soap-plant	C, G
Dichelostemma capitatum	blue dicks	C, G
Lilium sp.	lily*	C
Muilla clevandii	San Diego goldenstar†	F
Yucca aloifolia	Spanish bayonet*	G
Yucca schidigera	Mohave yucca	C, G
Yucca sp.	yucca	A, D
Yucca whipplei	Our Lord's candle	G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
MONOCOTS (cont.)		
Poaceae – Grass Family		
Arundo donax	giant reed*	A, B, C, G
Avena barbata	slender wild oat*	D, E, G, J
Avena fatua	wild oat*	A, C, E, G
Avena sp.	wild oat*	G
Bothriochloa barbinodis	cane bluestem	G
Brachypodium distachyon	purple falsebrome*	G
Bromus diandrus	common ripgut grass*	D, E, G, J
Bromus hordeaceus	soft chess*	E, G, J
Bromus madritensis ssp. *rubens*	foxtail chess*	C, E, G, J
Cortaderia jubata	pampas grass*	A, C, D, E, G, J
Cynodon dactylon	Bermuda grass*	C, D, E, G, J
Digitaria sanguinalis	large crabgrass*	E
Distichlis spicata	saltgrass	D, E, G, J
Erharta calycina	veldt grass*	G
Festuca sp.	fescue	D
Gastridium ventricosum	nit grass*	G
Holcus lanatus	common velvet grass*	E
Hordeum murinum	glaucous barley*	C
Lamarckia aurea	goldentop*	C
Leymus condensatus	giant wild rye	C, G, J
Leymus triticoides	beardless wild ryegrass	E, G
Lolium multiflorum	Italian ryegrass*	G
Melica imperfecta	melic	G
Muhlenbergia rigens	deergrass	G
Nassella pulchra	purple needlegrass	C, G, J
Nassella sp.	needlegrass	D, E, G
Paspalum dilatatum	dallis grass*	D, E, G
Pennisetum clandestinum	kikuyu grass*	E
Pennisetum setaceum	fountain grass*	A, D, E, G, J
Piptatherum miliaceum	smilo grass*	E, G
Poa annua	annual bluegrass*	C, E
Poa pratensis ssp. *pratensis*	Kentucky bluegrass*	J
Polypogon monspeliensis	rabbitfoot grass*	C, G
Schismus barbatus	Mediterranean grass*	G
Sporobolus sp.	dropseed*	E
Stenotaphrum secundatum	St. Augustine grass*	G
Triticum aestivum	wheat*	E
Vulpia myuros	fescue*	G, J
Typhaceae – Cattail Family		
Typha latifolia	broad-leaved cattail	A, D, G, J
Typha sp.	cattail	D

APPENDIX A (cont.)

ANIMAL SPECIES OBSERVED IN THE TCNP NRMP AREA

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
INVERTEBRATES		
Crustaceans		
Order Decapoda	crayfish	H
Order Ostracoda	ostracod	G
Insects		
Coleoptera – Beetles		
Mungantia histrionica	harlequin cabbage bug	D
Coccinella californica	California ladybird beetle	D
Lepidoptera – Butterflies		
Apodemia mormo virgulti	Behr's metalmark	C
Colias sp.	sulphur	G
Coenonympha californica californica	California ringlet	C
Coenonympha tuilla	common ringlet	J
Erynnis funeralis	funereal duskywing	C
Glaucopsyche lygdamus australis	southern blue	G
Leptotes marina	marine blue	G
Nymphalis antiopa	mourning cloak	G, J
Papilio rutulus	western tiger swallowtail	C, J
Pieris rapae	cabbage butterfly	C
Pontia protodice	common white	C, G
Vannessa annabella	west coast lady	C
Vannessa cardui	painted lady	J
Vannessa sp.	lady	G
VERTEBRATES		
Amphibians		
Bufo boreas	western toad	E
Hyla regilla	Pacific treefrog	C, E
Xenopus laevis	African clawed frog*	C, G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Reptiles		
Anguidae – Alligator Lizards		
Gerrhonotus multicarinatus	southern alligator lizard	C, E
Colubridae – Colubrid Snakes		
Lampropeltis getulus	common kingsnake	C, E
Pituophis melanoleucus	gopher snake	C, E
Iguanidae – Iguanids		
Sceloporus occidentalis	western fence lizard	C, E, G, J
Phrynosomatidae – Lizards		
Phrynosoma coronatum blainvillei	San Diego horned lizard†	C
Uta stansburiana	side-blotched lizard	E, G
Scincidae – Skinks		
Eumeces skiltonianus	western skink	C
Squamata – Snakes		
Anniella nigra argentea	silvery legless lizard	H
Teiidae – Whiptails and Relatives		
Aspidoscelis hyperythra beldingi	orange-throated whiptail†	G
Viperidae – Vipers		
Crotalus viridis	western rattlesnake	C, E, J
Crotalus exsul	red diamond rattlesnake	I
Birds		
Accipitridae – Hawks, Old World Vultures, Kites, Harriers, and Eagles		
Accipiter cooperii	Cooper's hawk†	A, B, C, G
Accipiter striatus	sharp-shinned hawk†	A, C
Aquila chrysaetos	golden eagle†	H
Buteo lineatus	red-shouldered hawk	A, C, D, G, J
Buteo jamaicensis	red-tailed hawk	A, C, D, G
Circus cyaneus	northern harrier†	C
Elanus leucurus	white-tailed kite†	A
Aegithalidae – Bushtit		
Baeolophus inornatus	oak titmouse	A
Psaltriparus minimus	bushtit	A, C, D, E, G, J

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Birds (cont.)		
Alcedinidae – Kingfishers		
Ceryle alcyon	belted kingfisher	B
Anatidae – Ducks, Geese, and Swans		
Anas platyrhynchos	mallard	G
Apodidae – Swifts		
Aeronautes saxatalis	white-throated swift	A, C, G
Chaetura vauxi	Vaux's swift	A
Ardeidae – Herons, Egrets, and Bitterns		
Ardea herodias	great blue heron	A, C
Butorides virescens	green heron	B
Casmerodius albus	great egret	A
Egretta thula	snowy egret	G
Nycticorax nycticorax	black-crowned night heron	A, G
Bombycillidae – Waxwings		
Bombycilla cedrorum	cedar waxwing	A
Cardinalidae – Cardinals		
Passerina amoena	lazuli bunting	A
Pheucticus melanocephalus	black-headed grosbeak	A, G
Caprimulgidae – Goatsuckers		
Chordeiles acutipennis	lesser nighthawk	C
Charadriidae – Plovers and Relatives		
Charadrius vociferous	killdeer	A, C
Columbidae – Pigeons and Doves		
Columba livia	rock dove*	A, C, D, E, G
Steptopelia risoria	ringed turtle dove*	A
Zenaida macroura	mourning dove	A, C, D, E, G
Corvidae – Jays, Crows, and Magpies		
Aphelocoma californica	western scrub jay	A, C, D, E, G, J
Corvus brachyrhynchos	American crow	C, G, J
Corvus corax	common raven	A, C, D, G, J

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Birds (cont.)		
Cuculidae – Cuckoos and their allies		
Geococcyx californianus	roadrunner	A
Emberizidae – Sparrows, Buntings, Blackbirds, Orioles and Relatives		
Aimophila ruficeps canescens	southern California rufous-crowned sparrow†	C, D
Euphagus cyanocephalus	Brewer's blackbird	A
Geothlypis trichas	common yellowthroat	C, G
Icterus cucullatus	hooded oriole	A
Icterus bullockii	northern oriole	A
Junco hyemalis oreganus	dark-eyed junco	A
Melospiza lincolnii	Lincoln's sparrow	A
Melospiza melodia	song sparrow	A, C, D, G
Passerella iliaca	fox sparrow	A
Molothrus ater	brown-headed cowbird	C, G
Pipilo maculatus	spotted towhee	C, D, E, G
Pipilo crissalis	California towhee	C, D, E, G
Sturnella neglecta	western meadowlark	C
Zonotrichia atricapilla	golden-crowned sparrow	A
Zonotrichia leucophyrys	white-crowned sparrow	A, C, D, G
Falconidae – Falcons		
Falco mexicanus	prairie falcon†	A
Falco peregrinus	American peregrine falcon†	G
Falco sparverius	American kestrel	A, C, G
Fringillidae – Finches and Relatives		
Carpodacus mexicanus	house finch	A, C, D, E, G
Carduelis psaltria	lesser goldfinch	A, C, D, G
Hirundinidae – Swallows		
Hirundo rustica	barn swallow	C
Petrochelidon pyrrhonota	cliff swallow	A, C, G
Stelgidopteryx serripennis	northern rough-winged swallow	C
Laniidae – Shrikes		
Lanius ludovicianus	loggerhead shrike†	A, G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Birds (cont.)		
Laridae – Gulls and Terns		
Larus delawarensis	ring-billed gull	A
Larus occidentalis	western gull	A, G
Larus sp.	gull	C, G
Mimidae – Mockingbirds and Thrashers		
Mimus polyglottos	northern mockingbird	A, C, D, E, G, J
Toxostoma redivivum	California thrasher	A, C, D, G
Motacillidae – Wagtails and Pipits		
Anthus rubescens	American pipit	A
Odontophoridae – Quails and Bobwhite		
Callipepla californica	California quail	A, C, E, G
Parulidae – Wood-warblers		
Dendroica coronata	yellow-rumped warbler	A, C, D
Dendroica nigrescens	black-throated gray warbler	A
Dendroica occidentalis	hermit warbler	A
Dendroica petechia brewsteri	yellow warbler	A, G
Dendroica townsedii	Townsend's warbler	A, D
Icteria virens	yellow-breasted chat†	G
Oporonis tolmiei	MacGillivray's warbler	A
Parulidae – Wood-warblers		
Vermivora celata	orange-crowned warbler	A, G
Vermivora ruficapilla	Nashville warbler	A
Wilsonia pusilla	Wilson's warbler	A
Passeridae – Old World Sparrows		
Passer domesticus	house sparrow*	A, E, G
Picidae – Woodpeckers and Wrynecks		
Colaptes auratus	northern flicker	C, D
Melanerpes formicivorus	acorn woodpecker	D
Picoides nuttallii	Nuttall's woodpecker	A, D, G, J
Psittacidae – Parrots		
Unknown	parrot*	G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Birds (cont.)		
Ptilogonatidae – Silky-flycatchers		
Phainopepla nitens	phainopepla	A, C
Regulidae – Kinglets		
Regulus calendula	ruby-crowned kinglet	A
Strigidae – Owls		
Bubo virginianus	great horned owl	A
Tyto alba	barn owl	A
Sturnidae – Starlings		
Sturnus vulgaris	European starling*	A, C
Sylviidae – Gnatcatchers		
Polioptila californica californica	coastal California gnatcatcher†	B, C, D, E, G, J
Thraupidae – Tanagers		
Piranga ludoviciana	western tanager	A
Timaliidae – Wrentits		
Chamaea fasciata	wrentit	A, E, G, J
Trochilidae – Hummingbirds		
Archilochus alexandri	black-chinned hummingbird	A
Calypte anna	Anna's hummingbird	A, C, D, E, G, J
Calypte costae	Costa's hummingbird	B, C, D
Selasphorus rufus	rufous hummingbird	A
Troglodytidae – Wrens		
Thryomanes bewickii	Bewick's wren	A, B, C, D, E, G, J
Troglodytes aedon	house wren	A, C, D, G
Turdidae – Thrushes		
Hylocichla guttata	hermit thrush	A
Turdus migratorius	robin	A, D

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Birds (cont.)		
Tyrannidae – Tyrant Flycatchers		
Contopus sordidulus	western wood-peewee	A, G
Empidonax difficilis	Pacific slope flycatcher	A, G
Empidonax traillii	willow flycatcher	A, G
Myiarchus cinerascens	ash-throated flycatcher	A, C, G
Sayornis nigricans	black phoebe	A, C, D, E, G
Sayornis saya	Say's phoebe	A, C, J
Tyrannus verticalis	western kingbird	A, C, G
Tyrannus vociferans	Cassin's kingbird	C, D, J
Vireonidae – Vireos		
Vireo gilvus	warbling vireo	A
Vireo bellii pusillus	least Bell's vireo†	F, G
Mammals		
Canidae – Foxes, Wolves, and Relatives		
Canis latrans	coyote	B, C, D, E, G
Urocyon cinereoargenteus	common gray fox	C
Vulpes vulpes	red fox	H
Didelphidae – New World Opossums		
Didelphis virginiana	Virginia opossum*	E
Felidae – Cats and Relatives		
Lynx rufus	bobcat	G
Geomyidae – Pocket Gophers		
Thomomys bottae	Botta's pocket gopher	C, E, G
Heteromyidae – Kangaroo Rats, Pocket Mice, and Kangaroo Mice		
Microtus californicus	California vole	E
Leporidae – Rabbits and Hares		
Sylvilagus audubonii	desert cottontail	B, D, G, J
Sylvilagus bachmani	brush rabbit	C, E, G
Lepus californicus bennettii	San Diego black-tailed jackrabbit†	G

SCIENTIFIC NAME	COMMON NAME*†	SOURCE‡
VERTEBRATES (cont.)		
Mammals (cont.)		
Muridae – Mice, Rats, and Voles		
Neotoma sp.	woodrat	B, C, D, E, G, J
Peromyscus maniculatus	deer mouse	E
Peromyscus californicus	California mouse	E
Reithrodontomys megalotus	western harvest mouse	E
Mustelidae – Weasels and Relatives		
Mephitis mephitis	skunk	E
Mustela frenata	long-tailed weasel	H
Procyonidae – Raccoons and Ringtails		
Procyon lotor	common raccoon	C, E
Sciuridae – Squirrels, Chipmunks, and Marmots		
Spermophilus beecheyi	California ground squirrel	B, C, E, G

*Denotes non-native species
†Denotes sensitive species
‡Source Codes:

A Tecolote Canyon Citizens Advisory Committee. 1982. Tecolote Canyon Natural Park Master Plan.

B Tierra Environmental Services. 2004. Biological Resources Report & Impact Assessment for the East Clairemont Segment Tecolote Canyon Emergency Sewer Repairs.

C Dudek & Associates, Inc. 2003a. Biological Resources Report & Impact Assessment for the Manning Canyon Emergency Sewer Maintenance & Repair Project.

D Earth Tech, Inc. 2003. Biological Resources Report for the Proposed Sewer Canyon Access Project Tecolote Canyon.

E Dudek & Associates, Inc. 2003b. Biological Resources Report & Impact Assessment for the Mt. Elbrus and Tecolote Canyon Emergency Sewer Repair Project.

F California Natural Diversity Database. 2004b. Special Animals.

G HELIX Environmental Planning, Inc. 2004 and 2005. Surveys of the Park.

H Eloise Battle. 2004 and 2005. Personal communication.

I Jeff Viator. 2004. Personal communication.

J Merkel & Associates, Inc. 2004. Conceptual Mitigation Plan for the Canyon Sewer Projects Within the Tecolote Canyon Natural Preserve.

EXPLANATION OF STATUS CODES FOR PLANT AND ANIMAL SPECIES

U.S. FISH AND WILDLIFE SERVICE

FE	Federally listed endangered
FT	Federally listed threatened
FSC	Federal species of concern

CALIFORNIA DEPARTMENT OF FISH AND GAME

SE	State listed endangered
ST	State listed threatened
CSC	California species of special concern
Fully protected	Fully protected species may not be taken or possessed without a permit from the Fish and Game Commission and/or the California Department of Fish and Game.

OTHER CODES

Multiple Species Conservation Program (MSCP) Covered

Multiple Species Conservation Program covered species for which City has take authorization within MSCP area.

Narrow Endemic Species

Some native species, primarily plants with restricted geographic distributions, soil affinities, and/or habitats, are referred to as a narrow endemic species. For vernal pools and identified narrow endemic species, the jurisdictions will specify measures in their respective subarea plans to ensure that impacts to these resources are avoided to the maximum extent practicable.

CALIFORNIA NATIVE PLANT SOCIETY (CNPS) CODES

LISTS

1A = Presumed extinct.

1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.

2 = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.

3 = Distribution, endangerment, ecology, and/or taxonomic information needed. Some eligible for state listing.

4 = A watch list for species of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

R-E-D CODE

R (Rarity)
1 = Rare, but found in sufficient numbers and distributed widely enough that the potential for extinction is low at this time.
2 = Distributed in a limited number of occurrences, occasionally more if each occurrence is small.
3 = Distributed in one to several highly restricted occurrences, or present in such small numbers that it is seldom reported.

E (Endangerment)
1 = Not endangered
2 = Endangered in a portion of its range
3 = Endangered throughout its range

D (Distribution)
1 = More or less widespread outside California
2 = Rare outside California
3 = Endemic to California

Natural Diversity Database Rank

Global Ranking

The global rank (G-rank) is a reflection of the overall condition of an element throughout its global range.

Species or Natural Community Level

G1 = Less than 6 viable element occurrences (EOs) OR less than 1,000 individuals OR less than 2,000 acres.

G2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres.

G3 = 21-80 EOs OR 3,000-10,000 individuals OR 10,000-50,000 acres.

G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.

G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

Natural Diversity Database Rank (cont.)

Global Ranking (cont.)

Subspecies Level

Subspecies receive a T-rank attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety.

State Ranking

The state rank (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 viable EOs OR less than 1,000 individuals OR less than 2,000 acres
- S1.1 = very threatened
- S1.2 = threatened
- S1.3 = no current threats known

S2 = 6-20 EOs OR 1,000-3,000 individuals OR 2,000-10,000 acres
- S2.1 = very threatened
- S2.2 = threatened
- S2.3 = no current threats known

S3 = 21-80 EOs or 3,000-10,000 individuals OR 10,000-50,000 acres
- S3.1 = very threatened
- S3.2 = threatened
- S3.3 = no current threats known

S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat.

S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

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APPENDIX B

MSCP COVERED SPECIES WHICH ARE NOT KNOWN TO OCCUR WITHIN THE TCNP NRMP AREA

APPENDIX B
MSCP COVERED SPECIES WHICH ARE NOT KNOWN TO OCCUR WITHIN THE TCNP NRMP AREA

PLANTS

COMMON NAME	SCIENTIFIC NAME
San Diego ambrosia	*Ambrosia pumila*
Aphanisma	*Aphanisma blitoides*
Del Mar manzanita	*Arctostaphylos glandulosa* ssp. *crassifolia*
Otay manzanita	*Arctostaphylos otayensis*
Coastal dunes milk-vetch	*Astragalus tener* var. *titi*
Encinitas baccharis	*Baccharis vanessae*
Thread-leaved brodiaea	*Brodiaea filifolia*
Dunn's mariposa lily	*Calochortus dunnii*
Slender-pod jewelflower	*Caulanthus stenocarpus*
Lakeside ceanothus	*Ceanothus cyaneus*
Salt marsh bird's-beak	*Cordylanthus maritimus* ssp. *maritimus*
Orcutt's bird's-beak	*Cordylanthus orcuttianus*
Del Mar Mesa sand aster	*Corethrogyne filaginifolia* var. *linifolia*
Tecate cypress	*Cupressus forbesii*
Short-leaved dudleya	*Dudleya brevifolia*
Sticky dudleya	*Dudleya viscida*
Palmer's ericameria	*Ericameria palmeri* ssp. *palmeri*
Coast wallflower	*Erysimum ammophilum*
Otay tarplant	*Deinandra conjugens*
Heart-leaved pitcher sage	*Lepechinia cardiophylla*
Gander's pitcher sage	*Lepechinia ganderi*
Nuttall's lotus	*Lotus nuttallianus*
Prostrate navarretia	*Navarretia prostrata*
Dehesa beargrass	*Nolina interrata*
Snake cholla	*Opuntia californica* var. *californica*
California Orcutt grass	*Orcuttia californica*
Torrey pine	*Pinus torreyana* ssp. *torreyana*
Small-leaved rose	*Rosa minutifolia*
Gander's butterweed	*Senecio ganderi*
Narrow-leaved nightshade	*Solanum tenuilobatum*
Parry's tetracoccus	*Tetracoccus dioicus*
Dense reed grass	*Calamagrostis densa*
Felt-leaved monardella	*Monardella hypoleuca* ssp. *lanata*
San Miguel savory	*Satureja chandleri*
Nevin's barberry	*Berberis nevinii*

APPENDIX B (cont.)
MSCP COVERED SPECIES WHICH ARE NOT KNOWN TO OCCUR WITHIN THE TCNP NRMP AREA (cont.)

ANIMALS

COMMON NAME	SCIENTIFIC NAME
Salt marsh skipper	*Panoquina errans*
Thorne's hairstreak butterfly	*Mitoura thornei*
Arroyo southwestern toad	*Bufo microscaphus* spp. *californicus*
California red-legged frog	*Rana aurora* ssp. *draytonii*
California brown pelican	*Pelacanus occidentalis* ssp. *californicus*
Reddish egret	*Egretta rufescens*
White-faced ibis	*Plegadis chihi*
Canada goose	*Branta canadensis* ssp. *moffitti*
Bald eagle	*Haliaeetus leucocephalus*
Swainson's hawk	*Buteo swainsoni*
Light-footed clapper rail	*Rallus longirostris* ssp. *levipes*
Western snowy plover	*Charadrius alexandrinus* ssp. *nivosus*
Mountain plover	*Charadrius montanus*
Long-billed curlew	*Numenius americanus*
Elegant tern	*Sterna elegans*
California least tern	*Sterna antillarum* ssp. *browni*
Western burrowing owl	*Athene cunicularia* ssp. *hypugaea*
Coastal cactus wren	*Campylorhynchus brunneicapillus* ssp. *couesi*
Belding's Savannah sparrow	*Passerculus sandwichensis* ssp. *beldingi*
Large-billed Savannah sparrow	*Passerculus sandwichensis* ssp. *rostratus*
Tri-colored blackbird	*Agelaius tricolor*
American badger	*Taxidea taxus*
Mountain lion	*Felis concolor*
Southern mule deer	*Odocoileus hemionus fuliginata*

APPENDIX C

CITY OF SAN DIEGO PARK AND RECREATION DEPARTMENT
OPEN SPACE DIVISION TRAIL STANDARDS

City of San Diego
Park and Recreation Department
Open Space Division

Trail Standards

Revised December 2004

Introduction

To identify and quantify trail standards, a basic classification based on existing use, projected use, and demographics specific to the area must be identified. Trail use, alignment, and classification will be consistent with Community Plans and other guiding documents. While most of the existing trails provide loops, and local destinations within the specific park units, many of these trails are within open space canyons that extend easterly to westerly. The majority of these open space canyons are currently managed by Park and Recreation staff. Many of these east / west canyons provide not only recreational hiking, biking, and equestrian trails, but commuter routes that are used by local residents. Additionally, many of the smaller open space canyons that are not under the direct management of designated open space units, have existing trails or paths that provide pedestrian and bicycle access to other parts of the City and the larger Open Space Regional Parks. Trails within the City managed lands will range from "primitive" (narrow, marginally improved) trails, to "improved" (wide, varying degree of improvements). The majority of the trails are existing use patterns and any improvements to match the trail classification will be implemented to improve safety, sustainability, and provide for protection of natural and cultural resources.

Trail Classifications

General classification of trails area as follows:

- **Primitive Trails**
  These trails will vary in width, with a minimum trail base width of 48 inches. Actual used trail width may be less than this base. Minimum base is to accommodate maintenance needs, bi-directional travel, and provide safe passing space. These are trails that see limited use, are usually more difficult, with grades that may exceed trail standards, and are primarily for recreational users.

- **Moderate Use Trails**
  These trails will have a minimum trail base width of 60 inches. These trails may be multi-use, are either destination-oriented, loop trails, or connector trails. These trails are usually less difficult with moderate grades (some exceeding trail standards), and usually will see multiple direction travel. Trail engineering and tread improvements may include surfacing amendments, and structures for resource protection and visitor safety.

- **High-Use Recreational Trails**
  These trails are usually existing service roads that provide recreational trail corridors. These are normally destination-oriented, or connector trails. Most of these trails/roads provide access for park management staff (Park Rangers), and emergency response. Additionally, many of these trails/roads were originally constructed for utility access and maintenance (Metropolitan Wastewater Department, Water Department, SDG&E), and are still active for these uses. Width of these trails/roads will be no less than 8 feet, and will average 12 to 14 feet. Tread surface is usually graded annually by utility companies, with minor repairs and improvements made by Park staff (as needed). As these trails/roads are usually linear to the orientation of the Park (east/west), many local residents use these routes as commutes to and from work. Tread surfaces may be improved with the installation of surfacing material to reduce erosion, and provide for trail sustainability.

- **Circulation Trails**
  These trails are usually associated with transportation corridors, and are often incorporated into new developments. They vary in width from 8 – 14 feet, and normally have improved trail surfacing. Many of these trails that are adjacent to high automobile traffic areas will be separated from traffic flow by fencing or other barriers. Grades on these trails will generally be gentle; however trails adjacent to roads may exceed normal trail standards and be consistent to maximum allowable road grades.

New Trail Construction Guidelines *

- **Grades:**
  Average grade 8% -12%. Maximum grade 15% for 100 feet, 20% for 50 feet.
- **Cross Slope:**
  Average cross slope 2% - 5%. Maximum cross slope at drains 15% (gradational from average cross slope edges)
- **Width:**
  Light use: Minimum constructed tread width 48 inches
  Moderate use: Minimum constructed tread width 60 inches **
  High Use: Minimum constructed tread width 96 inches
- **Surfacing:**
  Class II base. Minimum depth 6 inches compacted. (Note: all moderate and high-use trails require surfacing unless otherwise noted).
- **Elevation Changes:**
  Elevation changes will use climbing turns where possible. If switchbacks are used, running lengths should be as long as possible. Steps shall conform to step calculation standards.

Notes: *Trail design and construction standards will apply to all new trails unless otherwise specified. Existing trails will be upgraded where conditions allow.

**New trails to be constructed as connections to new development trail systems, major destinations, or connections to other trail systems will be constructed to this minimum width unless otherwise specified.

Barrier Free Trail Design and ADA Recommendations*

- **Grades:**
  5% or less for any distance
  Up to 8.33% for 200' max. Resting intervals no more than 200' apart
  Up to 10% for 30' max. Resting intervals every 30'
  Up to 12.5% for 10' max. Resting intervals every 10'
  No more than 30% of the total trail length may exceed a running slope of 8.33%
- **Cross Slope:**
  5% maximum
- **Width:**
  Clear tread width: 36" minimum
- **Passing Space:**
  Provided at least every 1000' where trail width is less than 60"
- **Signs:**
  Signs shall be provided indicating the length of the accessible trail segment
- **Obstacles:**
  2 inch high maximum (up to 3" high where running slopes are 5% or less)
- **Height:**
  120 inches for equestrians
  80 inches minimum for hikers, and bicyclists
- **Surface:**
  Surface shall be firm for wheelchair use (compacted Class II advised)

Note: *See Appendix A. These are pending recommendations ("Proposed Guidelines" / ADAAG) that have not been adopted. City standards will reflect final ruling when adopted.

New trail construction requires that all new trails are built to City Park and Recreation standards, and will be constructed to address issues of accessibility wherever possible. While the City Trail Standards reflect the minimum construction requirements, specific conditions may be modified by agreement with the City of San Diego Park and Recreation Department Open Space Trails Manager, or other staff qualified to make trail changes and modifications.

Trails to be constructed as part of new developments, and connected to other existing trails or destinations will be built to ADA recommendations where feasible. All proposed trails associated with new development must be approved by appropriate City of San Diego Park and Recreation Department Open Space Division staff, and constructed to approved plans. New trails that will not meet ADA recommendations will have an ADA component as part of the trail system wherever possible (viewing area, rest area,

interpretive location). Access to all ADA compliant facilities will need to be constructed to City standards.

The majority of new trails within the City of San Diego are associated with new development. Many of the new housing development projects, as well as commercial developments, have a trail component. While most of these new developments have an integrated "internal" trail system, consisting of all levels of paths and trails (including sidewalks), they normally include trail connections to other existing trails and trail systems. The connection of new trails to existing City trails and trail systems will need to be approved by the Park and Recreation Department Open Space Division, and must be constructed to minimal City standards. These standards will reflect maximum user compatibility, safety, and resource protection. Additionally, as these trails will ultimately come under the jurisdiction of the City, it is important that they are constructed to the highest standards to minimize maintenance needs, protect and preserve sensitive natural and cultural resources, and provide for safe and enjoyable use.

New trails proposed to be constructed by the City of San Diego are usually associated with improving connections to existing trails and facilities, as well as to other trail systems. These new trails may be built "in house" by City Park and Recreation staff, or contracted out. In all cases, new trails will be constructed to City standards, and will be built to "Barrier Free" or ADA standards wherever possible.

All new trails must be consistent with General, Community, and Specific Plans, and meet all regulatory requirements.

Existing Trails

Existing trails that are currently managed by the City of San Diego were developed utilizing a combination of service roads, easements, game trails, and trails created by casual use (volunteer or social trails). This trail system existed at the time of acquisition of those properties (for park and open space preservation) and, although many of these trails do not meet current trail standards, became the core of the City's trail network. Over the last decade Park Ranger staff, assisted by large numbers of volunteers and multiple funding sources, has, and continues to, successfully rationalize those existing conditions. The ultimate goal is the implementation of an organized trail system more in keeping with "Best Management Practices" consistent with National Park Service and California Department of Parks and Recreation guidelines. In working toward this goal, the City is striving toward the improvement of these trails during routine maintenance, and will work toward "barrier free" trails wherever possible. Many of the existing trail alignments may not be favorable to total accessibility; however ADA and Barrier Free construction will be implemented as opportunities allow.

Existing trails within both managed and unmanaged City lands vary. Trails may have evolved from game trails or casual use (narrow, single-track), or shared road or utility access (wide, 8 – 14 feet). These trails are usually accepted by the local community, and often as part of the community approved plans, as "the trail system". These trails

may be in any condition, from poor to excellent, depending on level of maintenance. Level of maintenance is usually dictated by safety, resource protection, and public need, and is often constrained by inadequate levels of funding, labor and material availability.

Classification of existing trails is normally determined by the City of San Diego, Park and Recreation department Open Space Division, or sometimes by General or Community Plans, and community input. As use and demographics change in many locations, it is important to evaluate use designations, and change if necessary. As trails become a larger part of overall transportation within the City, as well as for recreational enjoyment, it is important to provide rational classifications and linkages to other transportation corridors and routes. Trails may provide for important alternate transportation (commuters), or casual interconnection within communities (schools, shopping, parks). As conditions change in many of our open space areas, either by increased use or level of connectivity, many trails will need to be modified to a higher level of accessibility. While these trails may become more and more important as alternate transportation, it is important to maintain the integrity of the natural landscape and to preserve and protect sensitive natural and cultural resources.

Trail standards to both new trails and existing trails may need to be modified to specific locations. Topography, soil types, vegetative cover, and adjacent development may affect design criteria. All trail alignments, or trail reconstruction must be approved by the Open Space Trails Manager or other appropriate Park and Recreation Open Space Division staff.

Access Paths and Trails (Utility Access and Easements)

Throughout the open space lands within the City of San Diego, there are existing and proposed access paths and easements for utility service (MWWD, Water Department, SDG&E, etc.). Many of these access paths have been adopted by the community as trails. In many cases these paths provide reasonable trail connections and linkages. As these paths are normally linear, and bisect open space boundaries, they may provide excellent connections between developed areas of the City.

Whenever possible, and where conditions are favorable, improving these paths to trail standards may be advised. Grade and outslope for these paths should remain consistent to trail standards, however width may need to be modified to accommodate utility service equipment. It may be advisable to improve surfacing to reduce wear patterns and minimize erosion. In most cases, minor modifications to tread design will reduce, or eliminate significant erosion concerns.

Many easements and access paths are sited in, or near, canyon bottoms. These locations must be addressed to eliminate erosion and siltation problems. Substantial siltation could potentially affect both seasonal and year-round water flows. Specific modifications to tread design, tread surfacing, specific erosion controls built into the path, and planting with native vegetation may be implemented to alleviate erosion. Additionally, many of these access paths/trails may be important for Park and

Recreation, to provide access for Ranger patrols, maintenance, and emergency response. In cases where the need to maintain these trails for Park and Recreation use is identified, width should be no less than 8 feet. In cases where Park and Recreation access is not warranted, it may be advisable to build to required maintenance width, but to re-vegetate to minimum trail width (32 inches). Decisions as to ultimate use and needs should be consistent to all regulatory requirements, community plans and other guiding documents, and meet the identified needs of all involved agencies and departments. Developing and modifying access paths to a shared-use may allow for the elimination of other trails or impacts to the land.

Many of the access paths/trail/easements are located in open space canyons. As these sites may cross, or be located near, water courses it may be necessary to construct facilities to provide for long-term use for maintenance and/or public use. Improved facilities to be constructed may include bridges, retaining walls, B.M.P. drainage and erosion controls, or other appropriate facilities. If these facilities are expected to be used by heavy equipment, appropriate design and engineering standards that are consistent with trail standards must be implemented. Engineering design standards are current California State Park approved standards, and are consistent to trail design standards. If paths/trails are to be used by multiple use-groups (disabled, equestrian, etc.) specific design criteria is required. Specific data as to construction standards is on file with the City Open Space Trails Manager, and can be provided as needed.

Trail Tread Construction & Maintenance

Regional Considerations

A number of agencies have developed "Trail Standards" that are consistent to their particular agency. California State Parks has compiled one of the more comprehensive set of standards and design guidelines in their "Trail Maintenance and Management" manual. While these standards and design criteria are considered the most applicable to this region, some modifications may apply to specific locations. Specifics addressed in this section use the California State parks manual as baseline criteria. Soil types, vegetative cover, and precipitation in many areas of Southern California have considerably different characteristics than other areas within the State. General trail construction standards have been established by California State Parks, the National Forest Service, BLM, and other agencies, however many of these standards are not always effective in the Southern California region. Some of the major problems associated with specific regional conditions may require more inventive techniques in restoring and maintaining trail tread.

Soils in the San Diego region can be highly susceptible to erosion. Soil matrices commonly found in this region are very sandy, with little bonding capability. Because of the sensitive nature of many areas, the addition of chemical amendments may not be advised. Changes in degree of trail tread sloping, number of changes in sloping due to lack of cover (ie: watershed capacity), and drainage outfalls at switchbacks and climbing turns may need to be modified. Additionally, while it is traditionally unadvisable to add

organics to tread mix, the use of cuttings from trimmings to rebuild tread can be implemented in some cases.

In trail sections where there has been considerable erosion, and soil types are sandy or non-binding, the laying-in of alternating layers of vegetation mats (from cuttings), and soil has proven effective. Installation should consist of alternate layers of 4"- 10" cuttings covered with 12"- 16" soil, and thoroughly packed. Trail cap should be no less than 12" of soil. Properly implemented, this layering will stabilize soil migration and enhance bonding of soils as organic material breaks down. Settling of tread will occur as organics degrade, and periodic rebuilding may be required until tread stabilizes.

In some areas where soil migration (primarily sand) is a problem, native soils high in clay content may be added. The addition of inexpensive cat litter to sandy conditions has also been successful in stabilizing soil migration. Areas of rapid movement of soils may also require more aggressive trail sloping, or multiple changes in trail slope within short distances. Natural and manufactured polymer binders, soil cement, and clay amendments have been successfully implemented to stabilize & harden trail surfaces.

Insloping and outsloping of trails in areas susceptible to high erosion may have to be more aggressive to sheet water off the trail surface quickly. Additionally, in areas where consistent sloping is not possible, multiple changes in slope within shorter distances may be necessary to move water off the trail tread (rolling slope). Special care should be taken to make sure that water outfalls (drains) are well armored and they disperse water quickly. Focused water at drainages will cause rapid cutting.

The use of water bars is not advised in areas where serious erosion is a problem (both trail and surrounding area). Water bars tend to clog rapidly or be affected by serious down cutting at the outfall. Construction of "drain dips" at water-bar locations is an effective control to break and disperse water flow. If water bars are to be used until the trail surface can be properly engineered, multiple, closely spaced bars may be needed to control flow. These water-bars should be used as a temporary measure only.

Tread Surfacing Material

Trail tread surfacing can range from unimproved natural soils, to hardened / stabilized material. It is important to remember that the trail is to be an integral part of the natural landform, and should not substantially change natural landform characteristics. The ability of the trail tread to allow some water percolation into the watershed is also important.

Trail surfacing material may be needed for high use, improved accessibility (ADA), specific user groups (bikes, equestrians, etc.), or to reduce or eliminate erosion. Various grades of DG (decomposed granite) are often used, however a Class II, or Type II road base is preferable. This material is made of graded material, from very fine to coarse, and tends to lock and bind better than single grade DG. If this material is properly compacted it will remain sustainable even at grades exceeding trail standards (providing all other trail criteria are consistent to standards). With proper outsloping,

insloping, and slope reversals (rolling grade), a compacted Class II base trail tread will remain sustainable under high use and moderate to heavy rain events.

Often, trails may see very high-use by multiple user groups. Circulation trails and some high-use Recreation trails may need additional amendments to bind the tread matrix. Soil stabilizers can include, natural and chemical polymer binders, soil cement (Green Book), and addition of clay, lime or salts. Some of these stabilizing treatments may not be compatible with sensitive natural resources, and careful analysis of additive must be assessed before installation.

Switchbacks / Climbing Turns (Regional)
While switchbacks are not advisable when designing a trail with rapid changes in elevation, many existing trails do utilize this design. Because it is often impossible to redesign these trail sections, special care must be taken to manage these turns. If possible, redesign of turns, to more geographically friendly climbing turns, is preferable.

Careful assessment of switchback alignment is important in this region. Because of heavy rainfall events and the potential for serious erosion, water management on the trail tread is critical. Changes from outslope to inslope when approaching turns must be assessed to determine proper location. The transition zone (from out to in) will often act as a water bar when water flow is heavy. Care in selecting a location where water drains from this point must take into consideration the ability of the surrounding landforms to handle substantial water flows. Selecting areas with heavy vegetative cover or rocky, broken surfaces (to break water energy) will help minimize erosion at these points.

Outfalls, or drains at the apex of turns must also be critically assessed. Often, these turns will still dump water to the segment of trail below. This may mean that the insloped leg of trail in this section must be shortened to minimize water loads. Additionally, drainage design must effectively break water energy rapidly and disperse water before the next trail leg. A "Herringbone" design of small water bars may help direct water flow from channeling at the drain. If erosion channeling is already evident, a series of retaining walls may be used to break water flow and drop out transported soil. This will also help to rebuild the erosion channel.

Other problems commonly associated with trails utilizing multiple switchbacks and even climbing turns, are hikers cutting the trail. Due to the sensitive nature of regional vegetation, cover is lost quickly in these sections, and the ability of the landform to moderate water is compromised. In areas affected by serious cross traffic, erosion often becomes a major problem, and may affect the outslope design. Substantial retaining wall construction may be needed to not only keep visitors "on-trail" in these areas, but to break water flow. Additional retaining walls may need to be built within these sections to moderate both human use and water flow. Rock construction is preferable, as some water will still pass through structure, but slowing flow enough to drop out transported material. Rubble type walls are effective in the interior of these cuts as well. In extreme cases, where cut-across areas are extensive, other barriers may be necessary (fencing, signage, etc).

Whenever possible, trail design to deal with moderate to severe elevation changes should use climbing turns instead of switchbacks. In many locations, topography may allow for some realignment of existing switchbacks to climbing turn configurations.

Steps and Stairs
If elevation changes are too steep to construct trail within grade standards, steps or stairs may need to be considered to make the elevation transition. There are several types of these facilities that can be installed. Step configurations may be full-cribbed, partial-cribbed, cut-out stringer, un-cribbed (free-standing), and cable steps. With the exception of cable steps, all of these structures can be constructed of either wood, rock, or appropriate recycled material. Due to severe erosion many trail alignments have degraded to the point where steps are required for safety, as well as stabilization and protection of natural resources. Steps or stairs may be advised in some new trail construction to prevent degradation of landform, and visitor safety.

Steps must be constructed to engineering standards wherever possible (rise and run). If the site will not accommodate standard construction, step modifications may be acceptable upon inspection. Longer runs, or landings, are typically constructed for trails that may be used by horses, or in areas where long grades exceed advised step, run limits. Changes in design must be approved by the City Open Space Trails Manager or appropriate Park and Recreation Department staff before installation. The addition of transitional landings within the step carriage may be constructed to accommodate excessive length of runs, and to break change in dissimilar landing designs. The most important factor is to provide uniform rise and run throughout step alignments.

Prior to construction of steps, the site must be surveyed to determine structure configuration. This is done by calculating the rise and run of the site. Rise will be the total elevation gain (vertical distance) to be achieved. Run is the total horizontal distance to make this elevation change. Average acceptable rise standards are 7" – 9". Acceptable length of runs (or landings) is 13" – 18". To calculate needs, divide the total vertical rise by 7" or 8". This will determine the number of rises within the alignment. Subtract 1 from this number for the number of landings. Divide this number into the total length (horizontal distance). These are your runs (landings). If possible, adjust the total run length to conform to run standards.

Bridges & Puncheons (Regional)
The majority of water flow in the region tends to be ephemeral, however, as the region continues to develop, much of this seasonal flow has changed to "year-round" flow due to increased irrigation and hard surface runoff. Because the type of rainfall experienced in this region often tends towards heavy rain events of short duration, the water flow can be extreme at times.

Site assessment of location for bridges or puncheons must be carefully considered to determine suitability of construction. If locations for this type of construction (puncheons particularly) are being considered, it is important to look at flood event history at the site.

Careful assessment of the watershed and the potential for high-energy water flows may make use of structures inadvisable. The construction of Arizona style or ford crossings is preferred in these areas.

If puncheons are to be built, assessment of end member (mud sill) placement is important. Bank integrity, stream channel geography or alignment, or potential for migration of flow during large events, must receive careful consideration. If the site location appears to be fairly stable, and flood, or flow, history indicates the location does not experience much alteration, puncheons may be constructed. Anchoring one end of the structure may be done to secure the structure in extreme events. This will allow the puncheon some flexibility as it will swing away during these events, and can be relocated afterward.

Bridge construction in the region requires similar assessment as puncheons, however most bridge locations are normally in relatively stable flow areas. As local geologic conditions vary considerably in the region, assessment of bride foundation is important. Soil types or integrity of geologic structure for bridge footings may be questionable. In these areas the use of pilings for primary bridge support may be advised. Due to high erosion potential, bridge foundations and approaches may be compromised over time and not provide effective support. There are a variety of bridge configurations and material types that will address specific crossing needs and environmental constraints.

Drainage (Regional)
Due to the nature of regional rainfall, trail structure, and soil types, drainage concerns may require more extreme methods to manage water flow and minimize erosion. As previously stated, the arid nature of the region (sparse vegetation), violent rainfall events, and highly erosive soils requires careful "site specific" assessment when constructing drains.

Erosion is the primary cause of trail damage. Water volume + water velocity = water energy (ie: erosion). As water moves down the trail and increases in energy, it erodes material from the trail. As more material is added to the moving water, it becomes more effective at cutting more resistant materials. The longer and faster the water moves down the trail, the more erosion. By slowing and/or effectively diverting the water, the erosion process can be controlled.

Drainage on trails in this region is best accomplished with well designed "out-sloping" or "in-sloping" (at turns). State Park guidelines advise tread slope from 2% to 10%. This guideline is effective in new trail design, and long-term maintenance level tread surfaces, however higher percent grade may be required in some areas. Trails that have extreme pitches (grades), and suffer from high-energy water flow may require a more aggressive out-sloping to manage water flows. Installation of drain lenses, or large-area drain-dips may allow for reducing out-slope. Some trails may require out-sloping in excess of 15%-18% to stabilize tread and manage water flow. Extreme cross-slopes are normally associated with short-term stabilization, and should be modified to recommended standards as soon as feasible. Long pitches of steep grades

that are carrying large water loads may still require steep outsloping. This cross-slope must be designed so that it does not become a safety issue for trail users.

All constructed drains need to be well rocked, unless the landform can withstand water loads. When constructing drainage lenses or drain dips within the run of the trail, the area selected should be of large enough area to disperse water energy effectively. Focused drains, as in water-bars, tend to either clog rapidly, or create erosion problems at the outfall. Depending on pitch (steepness) of trail grade, and length, it may be advisable to add multiple drainage structures throughout the section. By adding drain-dips in a steep section of trail, water energy can be minimized. As the water slows, any material carried in transport drops out. Careful placement of drain-dips can actually result in adding material to the trail tread as it drops from the slowing water.
On sections of trail where it is difficult to divert water from the trail (entrenched trail), construction alternating, multiple, cross-slopes (rolling slope) within the trail run may be advised. By changing cross-slopes, the water is forced to slow down at each change. This will reduce the ability of the water to erode material and allow for any material it has picked-up to be dropped from the water. Depending on conditions, this method may effectively rebuild the trail over time.

Rock Construction (Regional)
Use of rock structures in this region is preferable to wooden or other structure, as it will last forever (if done correctly). Construction of rock steps, rock walls, and rock foundations are not only durable, but also aesthetically attractive. Several types of rock construction are used in this region, and may depend on available materials. Stacked rubble walls can be used for erosion control and as retaining walls in relatively flat areas. Fitted rock wall, steps and foundations are done without mortar or cement, and are dependant on careful selection and placement of rocks. Rock walls (both rubble & fitted) need to have the proper amount of layback to function properly. Structural foundations, such as bridge footings, also need proper layback and placement. Rock steps need to be constructed using engineered step calculations, and correct sizing and fitting of rock.

Rubble, or stacked rock walls can be used as erosion controls and as retaining walls for trails or other structures. This type of wall serves well as an erosion control as it will allow some water flow, but will control high-energy water flows. By reducing water energy, transported soil material will drop from suspension in water and rebuild areas where soil has been lost. These types of walls are usually out of areas of visitor traffic and may be loosely constructed. Rubble / stacked walls used as retaining walls for trails or other facilities where visitor use is anticipated, need to be constructed so they will withstand more severe impacts. This construction need to be fitted to some degree to allow interlocking of rock. Construction needs to begin with large rocks for base material, grading to smaller material near the top. Small rock and fragments of rock should be used to chink openings between larger rocks and will further lock in the structure. Friable (easily broken) rock works well for chinking. If being built to retain any fill material, the wall needs to have sufficient layback against the weight of this fill.

Fitted rock-walls, foundations, and step carriage components need careful selection and fitting of rock. This type of work can be mortared or cemented in place if needed, however properly constructed rock structures normally do not require this unless there are difficulties in securing structure to bedding. Fitted rockwork needs to meet requirements of secure bedding, good edge contacts, and careful "breaking" of all joints. Sufficient layback of these structures is important, with those structures built on sloping ground needing more pronounced layback. Chinking of gaps is advised with fitted rockwork, as well. This will enhance locking of larger rocks. Secure locking of cap rocks is also important, especially on retaining walls where visitors may dislodge them.

Rock steps require careful selection and fitting also. Rocks used for step construction need to be of sufficient size (> 80 lbs.) so they cannot be dislodged from set locations. It is also important to lock all edges so steps remain secure. Proper engineering of the step carriage is important. Wherever possible, step carriages should conform to engineered standards (rise & run). Some step carriage locations may not fit within standard calculations. If it is necessary to construct steps that cannot conform, it is important that all steps within run are uniform in both rise and run.

Retaining Walls

Retaining walls may be constructed for various reasons. Stabilization of slopes for resource protection and visitor safety, bridge and other structural foundations, and erosion control and capture of sediment may require retaining wall structures. Landform compatibility must be assessed before construction to determine suitability.

Retaining walls may be constructed of rock (fitted and stacked), manufactured block, lumber, or recycled construction material (Trex, etc.). Purpose of retaining wall may dictate engineering standards for construction. Smaller walls built for minor erosion controls, trail edge stabilization, minor bridge and puncheon structures, and some of the less significant slope failures may not require extensive engineering, however major structures may require construction to more severe engineering standards.

Correct degree of lay-back when constructing retaining wall is important. Additionally, construction of interlocking components of wall structure will increase load and holding capacity. Design plans for these structures is on file and available as needed.

In some cases, where retaining walls are to be constructed as a condition of other major facility construction, specific engineering standards may apply. As many walls may require substantial alteration of existing landforms, it is important to have a thorough understanding of constructions, and adherence to any regulatory guidelines or restrictions.

Road / Trail Construction

Roads often need to be constructed in our Open Space areas for easement purposes, access to areas requiring machinery and/or heavy equipment, or limited construction and/or maintenance of facilities. In many cases these roads are constructed for limited use during the duration of a specific project, and then will be utilized as a trail or as

access for patrolling by ranger vehicles. If roads are to be constructed for short-term usage, and will transitioned into trails, then grading methods should be modified.

Standard construction grading is based on moderate to heavy use of medium to heavy equipment. Use will also usually be over an extended period of time. Standard grading is traditionally done with the road cut to an inslope (tilt toward uphill bank), with drainage along the inside edge of the road. This drainage should always be armored to moderate erosion, but often is not. Additionally, out-fall drains are constructed to disperse water loads. These drains may be in the form of culverts, or armored crossover drains. While this can be an effective way to manage water flows, it may require a high maintenance schedule. Sloughing of the "uphill" bank and soils carried in transport from rain will often silt these drainage channels to the point of being ineffective, and also potentially clog outfall drains. Focused water energy within drain channels and at outfalls (culverts, armored crossings) may also cause excessive erosion problems. If roads are to be constructed for short-term use, trail engineering standards should be applied to minimize maintenance needs and erosion problems.

Roads constructed in open space areas that will ultimately be used as trails need to be built to the same standards as trails. The only modification would be to the degree of outslope (tilt away from uphill bank). Because of moderate use by medium to heavy equipment, it is often necessary to increase the "angle of outslope" to compensate for compaction and general wear patterns. This outslope will eventually settle into a slope more consistent to current trail standards. Careful assessment of soil types is important when designing road outslope. If soil types are high in certain clays, excessive outslope may create sliding hazards for heavy equipment. If these soil conditions are present, then a lesser degree of outslope, or short insloping may be recommended. Degree of outslope must also take into consideration, grade (or pitch) of road, anticipated water loads, and ability of the landform to naturally moderate water flow. Many areas experience rainfall events that are extreme, and may not show in normal data recording formats. Exceptional events that drop excessive amounts of rain within a short period of time may not show in standard records, and it becomes important to look for indications of these events. Also, information that can be obtained locally (park staff, local residents, etc.) may be valuable to determine the occurrence of extreme events.

Moderating flows at water crossings (gullies, ephemeral streams, etc.) should also use methods consistent to trail construction standards and practices. Increasing outslope at approaches and at minor crossing is advised. Armoring these crossings may also be advised. Major crossings or ephemeral streams also may need increased outsloping. Additionally, the "upstream" portion of this drainage may need erosion controls to moderate water flow impacts. Stacked "rubble" rock walls will moderate water energy, but still allow for flow. These walls should be constructed as shallow "U" shapes with the apex being toward the downstream side. Smaller crossings may also use this type of control. It may also be advised to install crushed rock as road base, to allow drainage.

Climbing turns (resembling switchbacks) used to reduce grades need to be addressed as similar types of turns used in trail construction. At turns where water loads would

impact the lower section of road using outsloping, the profile of the road should be modified to an inslope on the upper leg as the road approaches the turn. Water loads should then be directed away from the road at the apex of the turn. Selection of where the transition from outslope to inslope on the upper leg of the road will depend on site specific conditions. Outfall drains at the turns may need additional erosion controls to prevent erosion.

Roads graded for construction usually will be in excess of trail standards. If material is available, clear soil may be backfilled on the uphill side of the road to reduce width. Normally, time will reduce width with sloughing, and soils carried in water transport during rain periods, and the road will naturally narrow. If there are no constraints, trimming the downhill bank of the road may also be done to reduce width.

Road construction in open space areas needs to be addressed with the same diligence as in trail construction. Similar engineering techniques should be used with modifications to fit specific need and use. All erosion controls should reflect the City's current Best Management Practice's (BMP). Most importantly, an understanding of how the water moves across the land in specific areas is important to determine specific design and engineering standards and modifications.

Erosion Controls

Erosion controls for all areas should be consistent. This is especially important with trails, roads, and access paths. A basic understanding of what creates the greatest conditions for erosion is important. Two important factors remain consistent: Water Volume + Water Velocity = Erosion, and water runs in a straight line. If controls are constructed to break water flows, erosion will be minimized. Changes in slope or direction of travel will reduce velocities. Multiple controls will reduce both velocity and volume.

By looking at the surrounding landform, it is necessary to identify how water moves across the land. If the trail / road / path intersects the normal flows, it is important to design (or re-design) these facilities to allow water to move in a fashion as close to nature as possible. With the exception of established watercourses, gullies, and other definitive water channels, water will normally "sheet flow" across the land. It is important to re-establish this "sheet flow" when designing or re-engineering trails / roads / paths. By designing trails with consistent outslopes, water will shed off the trail in low volumes and velocities. If the landform itself is intact, the ability to absorb this water is increased.

Many of the trails and roads currently accepted as part of the City trail inventory consist of old scars that run down the fall line of slopes. Many of these sites are severely entrenched, and it may be difficult to direct water flows to sheet. In these and other extreme cases, "short water management" (managing water within short distances) is advised.

In areas where redirection to the sheet-flow concept is not feasible, the construction of silt dams, retaining walls, and well designed drains will moderate water flow. On trails

and roads that have long pitches where water cannot be redirected, a variety of options may be implemented.

- Periodic water diversions and drains. These drains may provide an escape for redirected water, or may be designed as silt basins to capture transported material as water slows. These capture basins require maintenance to redistribute captured material and remain effective.
- Multiple cross slope changes. It is possible to change the cross slope of the trail or road multiple times within short distances (20 – 50 feet). At each change water will slow and some transported material will fall out. Over a period of time, with maintenance as needed, this can potentially re-establish the topographic profile.
- Drain Dips. Drain dips and drain lenses can be constructed in areas where it may be effective to channel and redirect larger water flows. While these are very effective in managing water flow, it is important to reduce volumes and velocities as much as possible prior to drains.
- Swales and Culverts. These should be a "last resort" method of controlling water flows. Swales capture large volumes of water and channel them to a specific outfall. This increases volume and velocity, and may present a serious problem when dealing with unloading captured water. Swales are also normally rock lined. This rock will slow water sufficiently to allow transported material to fall out. If swales are not maintained, this material will block the swale and redirect water flow to paths of least resistance. Culverts are also problematic for the same reasons, with the additional problem of dealing with excessive water energy generated at the outfall.

Many areas that have been designated as trails may be old scars from previous disturbance. Firebreaks, easement corridors, old grading scars that have expanded over time, and fire damaged areas may present large surface areas that are prone to erosion. If these areas have been accepted as trails it is important to stabilize the entire affected area as soon as feasible. Stabilization may consist of silt dams (rock, earthen, straw waddles, etc), drains (through and capture), and multiple direction changes. The establishment of a trail within this disturbed corridor should meander as much as possible. Multiple changes in direction increase length and reduce grade. Careful selection of trail direction changes may provide opportunities to augment erosion controls. Extreme care should be used to assure that water does not flow down the trail.

In constructing large area silt dams, it is important to configure dam alignment to be effective. In general, dams should be constructed in a downhill "horseshoe" alignment, with the apex of the curve the desired flow pattern. By reconfiguring these dams during maintenance, it is possible to stabilize large surface areas.

R. Thompson
Updated 12/21/04

APPENDIX A

(Excerpted from)
Regulatory Negotiation Committee
On Accessibility Guidelines
For Outdoor Developed Areas

Final Report

September 30, 1999

BACKGROUND

The Architectural and Transportation Barriers Compliance Board (Access Board) is responsible for developing accessibility guidelines under the Americans with Disabilities Act of 1990 (ADA) to ensure that new construction and alterations of facilities covered by titles II and III of the (ADA) are readily accessible to and usable by individuals with disabilities.

SECTION 16. OUTDOOR DEVELOPED AREAS

Outdoor developed areas covered by this section shall comply with the applicable requirements of section 4 and the special application sections, except as modified or otherwise provided in this section.

16.1 General. All newly designed and constructed pedestrian trails or altered portions of existing pedestrian trails connecting to designated trailhead or accessible trails shall comply with 16. All newly designed and constructed camping facilities, picnic areas, and beach access routes or altered portions thereof shall comply with 16.

16.1.1 Extent of Application. Departures from specific technical provisions of this section shall be permitted where specified, and where at least one of the following conditions is present. The conditions in this section do not obviate or limit in any way obligations to comply with 16 at any point that the conditions are not present.

1. Where compliance would cause substantial harm to cultural, historic, religious, or significant natural features or characteristics; or,
2. Where compliance would substantially alter the nature of the setting or the purpose of the facility, or portion of the facility; or,
3. Where compliance would require construction methods or materials that are prohibited by federal, state, or local regulations or statutes; or,
4. Where compliance would not be feasible due to terrain or the prevailing construction practices.

DEFINITIONS.

Trail.
A route that is designed, constructed, or designated for recreational pedestrian use or provided as a pedestrian alternative to vehicular routes within a transportation system.

Designated Trailhead.
A designated point of access that may contain a parking area, information kiosks, restrooms, water hydrants, and may be reached by vehicular or pedestrian access.

Tread width.
The path or visible trail surface perpendicular to the direction of travel. The clear tread width of the trail is the width of the useable trail tread, measured perpendicular to the direction of travel and on or parallel to the surface of the useable trail tread. The minimum clear tread width is the narrowest measurement on the useable trail tread.

16.2 Trails. Where trails are provided, the trail shall comply with 16.2. Where provided, elements located on accessible trails shall comply with 16.5 through 16.21. Elements are not required to be connected by an outdoor recreation access route.

EXCEPTIONS:
1. Where one or more of the conditions in 16.1.1 exists, and where one or more of the conditions in this exception exists, the provisions of 16.2 shall not apply after the first point of departure. The segment of the trail between the trailhead and the first point of departure shall comply with 16.2 unless the trail segment is 500 feet (150 m) or less in length. Where there is a prominent feature less than 500 feet (150 m) from the trailhead, the trail segment between the trailhead and the prominent feature shall comply with 16.2.
The conditions of this exception are:
(a) The combination of running slope and cross slope exceeds 40 percent for over 20 feet (6100 mm); or
(b) A trail obstacle 30 inches (760 mm) or more in height across the full tread width of the trail; or
(c) The surface is neither firm nor stable for a distance of 45 feet or more; or
(d) A clear width less than 12 inches (305 mm) for a distance of 20 feet (6100 mm) or more

2. Where one or more of the conditions in 16.1.1 are met resulting in departures from the technical provisions in 16.2 for over 15 percent of the length of the trail, 16.2 shall not apply after the first point of departure. The segment of the trail between the trailhead and the first point of departure is required to comply with 16.2 unless the trail segment is 500 feet (150 m) or less in length. Where there is a prominent feature less than 500 feet (150 m) from the trailhead, the trail segment between the trailhead and the prominent feature shall comply with 16.2.

16.2.1 Surface. The trail surface shall be firm and stable.

EXCEPTION.
The provision shall not apply where a firm and stable surface can not be provided because at least one of the four conditions specified in 16.1.1 applies.

16.2.2 Clear Tread Width. The clear tread width of the trail shall be 36 inches (915 mm) minimum.

EXCEPTION.
The clear tread width shall be permitted to be reduced to no less than 32 inches (815 mm) minimum where at least one of the four conditions specified in 16.1.1 apply. 2. The provision shall not apply where 32 inches (815 mm) minimum clear tread width can not be provided because at least one of the four conditions specified in 16.1.1 applies.

16.2.3 Openings. Openings in trail surfaces shall be of a size that does not permit passage of a ½ inch (13mm) diameter sphere. Elongated openings shall be placed so that the long dimension is perpendicular or diagonal to the dominant direction of travel.

EXCEPTION.
Elongated openings are permitted to be parallel to the dominant direction of travel where the opening does not permit passage of a 1/4 inch (6.5 mm) diameter sphere. 2. Openings shall be permitted to be of a size that do not permit passage of a 3/4 inch (19 mm) diameter sphere where at least one of the conditions in 16.1.1 apply. 3. Where openings that do not permit passage of a 3/4 inch (19 mm) diameter sphere are not feasible, because at least one of the conditions in 16.1.1.applies, the provisions of 16.2.3. shall not apply

16.2.4 Protruding Objects. Protruding objects on trails shall comply with ADAAG 4.4.1. and shall have 80 inches (2030 mm) minimum clear head room.

EXCEPTION.
Where vertical clearance of a trail is reduced to less than 80 inches (2030 mm) where one of the four conditions specified in 16.1.1 applies, a barrier to warn blind and visually impaired persons shall be provided.

16.2.5 Tread Obstacles. Where tread obstacles exist, they shall not exceed 2 inches (50 mm) high maximum.

EXCEPTION.
Tread obstacles shall be permitted to be 3 inches (75 mm) maximum where running and cross slopes are 1:20 or less. 2. The provision shall not apply where tread obstacles greater than 3 inches (75 mm) exist, because at least one of the four conditions specified in 16.1.1 applies.

16.2.6 Passing Space. Where the clear tread width of the trail is less than 60 inches (1525 mm), passing spaces shall be provided at intervals of 1000 feet (300 m) maximum. Passing spaces shall be either a 60 inches (1525 mm) minimum by 60 inches (1525 mm) minimum space, or an intersection of two walking surfaces which

provide a T-shaped space complying with ADAAG 4.2.3 provided that the arms and stem of the T-shaped space extend at least 48 inches (1220 mm) beyond the intersection.

EXCEPTION.
The provision shall not apply where passing space cannot be provided because at least one of the four conditions specified in 16.1.1 applies. 16.2.7 Slopes. Slopes shall comply with 16.2.7.1 and 16.2.7.2.

EXCEPTION.
For open drainage structures, a running slope of 14 percent is permitted for 5 feet maximum (1525 mm) with a cross slope of 1:20 maximum. Cross slope is permitted to be 1:10 at the bottom of the open drain, where clear tread width is 42 inches (1065 mm) minimum. 2. The provisions of this section do not apply where one or more conditions in 16.1.1 apply.

16.2.7.1 Cross Slope. The cross slope shall not exceed 1:20 maximum.

16.2.7.2 Running slope. Running slope of trail segments shall comply with one or more of the provisions of this section. No more than 30 percent of the total trail length shall exceed a running slope of 1:12.

16.2.7.2.1 Running slope shall be 1:20 or less for any distance.

16.2.7.2.2 Running slope shall be 1:12 maximum for 200 feet (61 m) maximum.
Resting intervals complying with 16.2.8 shall be provided at distances no greater than 200 feet (61 m) apart.

16.2.7.2.3 Running slope shall be 1:10 maximum for 30 feet (9150 mm) maximum. Resting intervals complying with 16.2.8 shall be provided at distances no greater than 30 feet (9150 mm) apart.

16.2.7.2.4 Running slope shall be 1:8 maximum for 10 feet (3050 mm) maximum.
Resting intervals complying with 16.2.8 shall be provided at distances no greater than 10 feet (3050 mm) apart.

16.2.8 Resting Intervals. Resting intervals shall be 60 inches (1525 mm) minimum in length, shall have a width at least as wide as the widest portion of the trail segment leading to the resting interval, and have a slope not exceeding 1:20 in any direction.

EXCEPTION.
The provision shall not apply where resting spaces cannot be provided because at least one of the four conditions specified in 16.1.1 applies.

APPENDIX D

SDG&E SUBREGIONAL NCCP OPERATIONAL PROTOCOLS

7.1 Operational Protocols

Operational protocols represent an environmentally sensitive approach to traditional utility construction, maintenance and repair Activities recognizing that slight adjustments in construction techniques can yield major benefits for the environment. The appropriate Operational Protocols for each individual project will be determined and documented by the Environmental Surveyor. The information regarding the qualifications and responsibilities of the environmental surveyor is contained in Appendix B. The following mitigation measures shall be adhered to by SDG&E.

7.1.1 General Behavior for All Field Personnel

1. Vehicles must be kept on access roads. A 15 mile-per-hour speed limit shall be observed on dirt access roads to allow reptile species to disperse. Vehicles must be turned around in established or designated areas only.

2. No wildlife, including rattlesnakes, may be harmed, except to protect life and limb.

3. Firearms shall be prohibited on the rights-of-way except for those used by security personnel.

4. Feeding of wildlife is not allowed.

5. SDG&E personnel are not allowed to bring pets on the rights-of-way in order to minimize harassment or killing of wildlife and to prevent the introduction of destructive domestic animal diseases to native wildlife populations.

6. Parking or driving underneath oak trees is not allowed in order to protect root structures except in established traffic areas.

7. Plant or wildlife species may not be collected for pets or any other reason.

8. Littering is not allowed. SDG&E shall not deposit or leave any food or waste on the rights-of-way or adjacent property.

9. Wild Fires shall be prevented or minimized by exercising care when driving and by not parking vehicles where catalytic converters can ignite dry vegetation. In times of high fire hazard, it may be necessary for trucks to carry water and shovels, or fire extinguishers in the field. The use of shields, protective mats, or other fire prevention methods shall be used during grinding and welding to prevent or minimize the potential for fire. Care should be exhibited when smoking in natural habitats.

10. Field crews shall refer environmental issues including wildlife relocation, dead or sick wildlife, hazardous waste, or questions about avoiding environmental impacts to the Environmental Surveyor. Biologists or experts in wildlife handling may need to be brought in by Environmental Surveyor for assistance with wildlife relocations.

7.1.2 Training

11. All SDG&E personnel working within the project area shall participate in an employee training program conducted by SDG&E, with annual updates. The program will consist of a brief discussion of endangered species biology and the legal protections afforded to Covered Species; a discussion of the biology of the Covered Species protected under this Subregional Plan; the habitat requirements of these Covered Species; their status under the Endangered Species Acts; measures being taken for the protection of Covered Species and their habitats under this Subregional Plan; and a review of the Operational Protocols. A fact sheet conveying this information will also be distributed to all employees working in the project area.

12. Designated SDG&E staff will conduct selected reviews of SDG&E operations. Any proposed modifications to Operational Protocols, procedures or conditions will be promptly provided to CDFG and USFWS for their review and input for required permit or Subregional Plan amendments.

7.1.3 Preactivity Studies

13. The Environmental Surveyor shall conduct preactivity studies for all activities occurring off of access roads in natural areas. The scope of these studies is included in Appendix A. The Environmental Surveyor will complete a preactivity study form contained in Appendix A, including recommendations for review by a biologist and construction monitoring as appropriate. Biologists should be called in when there is the potential for unavoidable impacts to Covered Species. The forms are for information only, and will not require CDFG or USFWS approval. These forms shall be faxed to CDFG and USFWS, along with phone notification, who will reply within 5 working days, indicating if they would like to review the project and/or suggest recommendations for post project monitoring. If a biologist is required, he/she will be contacted concurrent to notification to CDFG and USFWS. SDG&E's project may proceed during this time if necessary, in compliance with the recommendations of the biologist (For narrow endemic species see mitigation IV following Table 3.1). USFWS survey protocols performed by qualified biologists will be required for new projects which are defined as projects requiring CEQA review.

    In those situations where the Environmental Surveyor cannot make a definitive species

identification, an on-call biologist will be brought in. When the biologist is called, he or she will be contacted concurrently with CDFG and USFWS. The biologist will make the determination of the species in question and recommend avoidance or mitigation approaches to the Environmental Surveyor and a decision will be made. In those situations where more than one visit may be necessary to identify a given species, such as certain birds, no more than three site visits shall be required. It is expected that the typical USFWS search protocols will not be utilized in most situations due to the Plan's avoidance priority. Background information necessary to complete the annual report shall be collected on the preactivity study form and used by SDG&E to prepare the annual report.

14. In order to ensure that habitats are not inadvertently impacted, the Environmental Surveyor shall determine the extent of habitat and flag boundaries of habitats which must be avoided. When necessary, the Environmental Surveyor should also demark appropriate equipment laydown areas, vehicle turn around areas, and pads for placement of large construction equipment such as cranes, bucket trucks, augers, etc. When appropriate, the Environmental Surveyor shall make office and/or field presentations to field staff to review and become familiar with natural resources to be protected on a project specific basis.

15. SDG&E will maintain a library of rare plant locations known to SDG&E occurring within easements and fee owned properties. "Known" means a verified population, either extant or documented using record data. Information on known sites may come from a variety of record data sources including local agency Habitat Conservation Plans, pre-activity surveys, or biological surveys conducted for environmental compliance on a project site (e.g. initial study), but there is no requirement for development of original biological data. Plant inventories shall be consulted as part of pre-activity survey procedures.

7.1.4 Maintenance, Repair and Construction of Facilities

16. Maintenance, repair and construction Activities shall be designed and implemented to minimize new disturbance, erosion on manufactured and other slopes, and off-site degradation from accelerated sedimentation, and to reduce maintenance and repair costs.

17. Routine maintenance of all Facilities includes visual inspections on a regular basis, conducted from vehicles driven on the access roads where possible. If it is necessary to inspect areas which cannot be seen from the roads, the inspection shall be done on foot, or from the air.

18. When the view of a gas transmission line marker becomes obscured by vegetation on a regular basis requiring repeated habitat removal, consideration shall be given to the replacement of markers with taller versions.

19. Erosion will be minimized on access roads and other locations primarily with water bars. The water bars are mounds of soil shaped to direct flow and prevent erosion.

20. Hydrologic impacts will be minimized through the use of state-of-the-art technical design and construction techniques to minimize ponding, eliminate flood hazards, and avoid erosion and siltation into any creeks, streams, rivers, or bodies of water by use of Best Management Practices.

21. When siting new facilities, every effort will be made to cross the wetland habitat perpendicular to the watercourse, spanning the watercourse to minimize the amount of disturbance to riparian areas (See Figure 4).

22. Gas and other facilities cross streambeds and require maintenance and repair. During such times water may be temporarily diverted as long as after disturbance natural drainage patterns are restored to minimize the impact of the disturbance and help to reestablish or enhance the native habitat. Erosion control during construction in the form of intermittent check dams and culverts should also be considered to prevent alteration to natural drainage patterns and prevent siltation.

23. Impacts to wetlands shall be minimized by avoiding pushing soil or brush into washes or ravines.

24. During work on facilities, all trucks, tools, and equipment should be kept on existing access roads or cleared areas, to the extent possible.

25. Environmental Surveyor must approve of activity prior to working in sensitive areas where disturbance to habitat may be unavoidable.

26. Insulator washing is allowed from access roads if other applicable protocols are followed.

27. Brush clearing around facilities for fire protection shall not be conducted from March through August without prior approval by the Environmental Surveyor. The Environmental Surveyor will make sure that the habitat contains no active nests, burrows, or dens prior to clearing.

28. In the event SDG&E identifies a covered species of plant within a 10' radius around power poles, which is the area required to be cleared for fire protection purposes, SDG&E shall notify USFWS (for ESA listed plants), and CDFG (for CESA listed plants), in writing, of the plant's identity and location and of the proposed Activity, which will result in a Take of such plant. Notification will occur ten (10) working days prior to such Activity, during which time USFWS or CDFG may remove such plant(s). If neither USFWS or CDFG have removed such plant(s) within the ten (10) working days following the notice, SDG&E may proceed to complete its fire clearing and cause a Take of such plant(s).

    When fire clearing is necessary in instances other than around power poles, and the potential for impacts to Covered Species exists, SDG&E will follow the preactivity study and notification procedures in Operational Protocol number 13.

29. Wire stringing is allowed year round in sensitive habitats if conductor is not allowed to drag on ground or in brush and vehicles remain on access roads.

30. Maintenance of cut and fill slopes shall consist primarily of erosion repair. In situations where revegetation would improve the success of erosion control, planting or seeding with native hydroseed mix may be done on slopes.

31. Spoils created during maintenance operations shall be disposed of only on previously disturbed areas designated by the Environmental Surveyor or used immediately to fill eroded areas. Cleared vegetation shall be hauled off the rights-of-way to a permitted disposal location.

32. Within 6 months of Plan approval, environmentally sensitive tree trimming locations will be identified in the tree trim computer data base system utilized by tree trim contractors. (This data base also tracks the date of each tree trim, type of tree, where threatening dogs reside, etc.). The Environmental Surveyor should be contacted to perform a preactivity survey when trimming is planned in environmentally sensitive areas. Whenever possible, trees in environmentally sensitive areas (determined by CDFG and SDG&E) will be scheduled for trimming in the non-sensitive times.

33. No new Facilities and Activities shall be planned which disturb vernal pools, their watersheds, or impact their natural regeneration. Continued historic maintenance of existing infrastructure utilizing existing access roads is allowed to continue in areas containing vernal pool habitat. New construction of overhead infrastructure which spans vernal pool habitats is allowed as long as the placement of facilities or the associated construction activities in no way impact the vernal pools.

34. If any previously unidentified dens, burrows, or plants are located on any project site after the preactivity survey, the Environmental Surveyor shall be contacted. Environmental Surveyor will determine how to best avoid or minimize impacting the resource by considering such methods as project or work plan redevelopment, equipment placement or construction method modification, seasonal/time of day limitations, etc...

35. The Environmental Surveyor shall conduct monitoring as recommended in the preactivity survey report. At completion of work, the Environmental Surveyor shall check to verify compliance, including observing that flagged areas have been avoided and that reclamation has been properly implemented. Also at completion of work, the Environmental Surveyor is responsible for removing all habitat flagging from the construction site.

36. The Environmental Surveyor shall conduct checks on mowing procedures, to ensure that mowing is limited to a 12-foot wide area on straight portions of the road (slightly wider on radius turns), and that the mowing height is no less than 4 inches.

37. Supplies or equipment where wildlife could hide (e.g., pipes, culverts, pole holes) shall be inspected prior to moving or working on them to reduce the potential for injury to wildlife. Supplies or equipment that cannot be inspected or from which animals could not be removed shall be capped or otherwise covered at the end of each work day. Old piping or other supplies that have been left open, shall not be capped until inspected and any species found in it allowed to escape. Ramping shall be provided in open trenches when necessary. If an animal is found entrapped in supplies or equipment, such as a pipe section, the supplies or equipment shall be avoided and the animal(s) left to leave on its own accord, except as otherwise authorized by CDFG.

38. All steep-walled trenches or excavations used during construction shall be inspected twice daily (early morning and evening) to protect against wildlife entrapment. If wildlife are located in the trench or excavation, the Environmental Surveyor shall be called immediately to remove them if they cannot escape unimpeded.

39. Large amounts of fugitive dust could interfere with photosynthesis. Fugitive dust created during clearing, grading, earth-moving, excavation or other construction activities will be controlled by regular watering. At all times, fugitive dust emissions will be controlled by limiting on-site vehicle speed to 15 miles per hour.

40. Before using pesticides in areas where burrowing owls may be found, a pre-activity survey will be conducted.

7.1.5 Maintenance of access roads shall consist of:

41. Repair of erosion by grading, addition of fill, and compacting. In each case of repair, the total area of disturbance shall be minimized by careful access and use of appropriately sized equipment. Repairs shall be done after preactivity surveys conducted by the Environmental Surveyor and in accordance with the recommendations regarding construction monitoring and relevant protocols. Consideration should be given to source of erosion problem, when source is within control of SDG&E.

42. Vegetation control through grading should be used only where the vegetation obscures the inspection of facilities, access may be entirely lost, or the threat of Facility failure or fire hazard exists. The graded access road area should not exceed 12'-wide on straight portions (radius turns may be slightly wider) (See Figure 23).

43. Mowing habitat can be an effective method for protecting the vegetative understory while at the same time creating access to a work area. Mowing should be used when permanent access is not required since, with time, total revegetation is expected. If mowing is in response to a permanent access need, but the alternative of grading is undesirable because of downstream siltation potential, it should be recognized that periodic mowing will be necessary to maintain permanent access.

44. Maintenance work on access roads should not expand the existing road bed (See Figure 23).

45. Material for filling in road ruts should never be obtained from the sides of the road which contain habitat without approval from Environmental Surveyor..

7.1.6 Construction of new access roads shall comply with the following:

46. SDG&E access roads will be designed and constructed according to the SDG&E *Guide for Encroachment on Transmission Rights-of-Way (4/91).*

47. Access roads will be made available to managers of the regional preserve system subject to coordination with SDG&E.

48. New access roads shall be designed to be placed in previously disturbed areas and areas which require the least amount of grading in sensitive areas during construction whenever possible (See Figure 5). Preference shall be given to the use of stub roads rather than linking facilities tangentially.

49. SDG&E will consider providing access control on access roads leading into the regional preserve system where such control provides benefit to sensitive resources.

50. New access road construction is allowed year round. Every effort shall be made to avoid constructing roads during the nesting season. During the nesting season, the presence or absence of nesting species shall be determined by a biologist and appropriate avoidance and minimization recommendations followed.

7.1.7 Construction and Maintenance of Access Roads Through Streambeds

51. Construction of new access roads through streambeds requires a Streambed Alteration Agreement from CDFG and/or consultation with the Army Corps of Engineers.

52. Maintenance or construction vehicle access through shallow creeks or streams is allowed. However, no filling for access purposes in waterways is allowed without the installation of appropriately sized culverts. The use of geotextile matting should be considered when it would protect wetland species.

53. Staging/storage areas for equipment and materials shall be located outside of riparian areas. (See Figure 23).

7.1.8 Survey Work

54. Brush clearing for foot paths or line-of-sight cutting is not allowed from March through August in sensitive habitats without prior approval from the Environmental Surveyor, who will ensure that activity does not adversely affect a sensitive species.

55. SDG&E survey personnel must keep vehicles on existing access roads. No clearing of brush for panel point placement is allowed from March through August without prior approval from the Environmental Surveyor.

56. Hiking off roads or paths for survey data collection is allowed year round so long as other protocols are met.

7.1.9 Emergency Repairs

57. During a system emergency, unnecessary carelessness which results in environmental damage is prohibited.

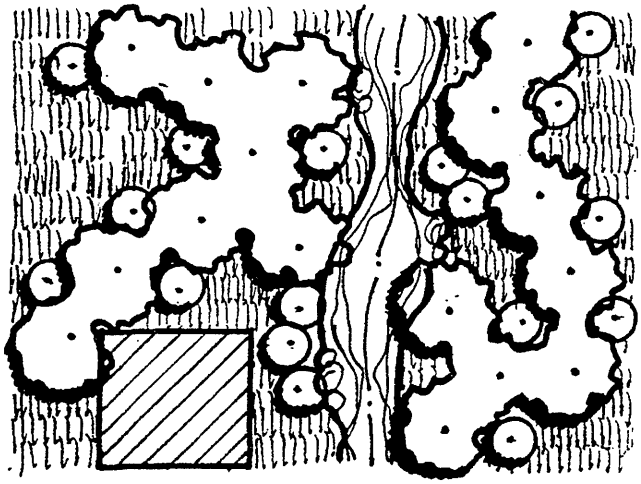
58. Emergency repair of facilities is required in situations which potentially or immediately threaten the integrity of the SDG&E system, such as pipe leaks, or downed lines, slumps, slides, major subsidence, etc. During emergency repairs the Operational Protocols contained in this Subregional Plan shall continued to be followed to fullest extent possible.

59. Once the emergency has stabilized, any unavoidable environmental damage will be reported to the Environmental Surveyor by the foreman. The Environmental Surveyor will develop a mitigation plan and ensure its implementation is consistent with this Subregional Plan.

7.1.10 Activities of Underlying Fee Owners

60. Most SDG&E rights-of-way are held in easement only. The activities of underlying fee owners cannot be controlled by SDG&E and are not covered by this Subregional Plan.

61. When sensitive habitat exists on either side of a utility right-of-way, SDG&E will not oppose underlying fee owners dedicating said property to conservation purposes. Underlying fee owners are expected to comply with applicable federal, state, and local regulations.



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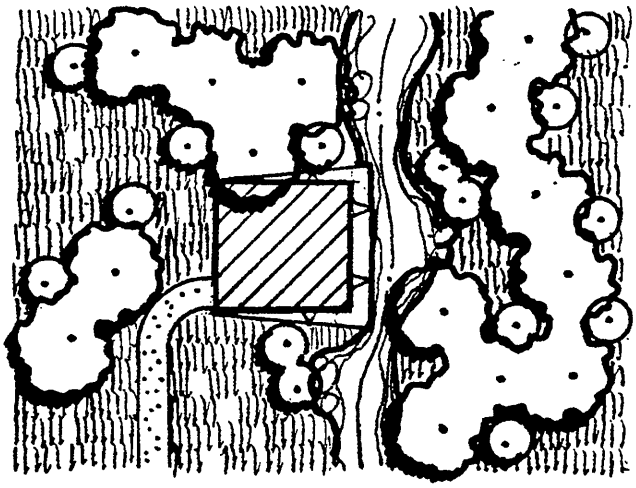

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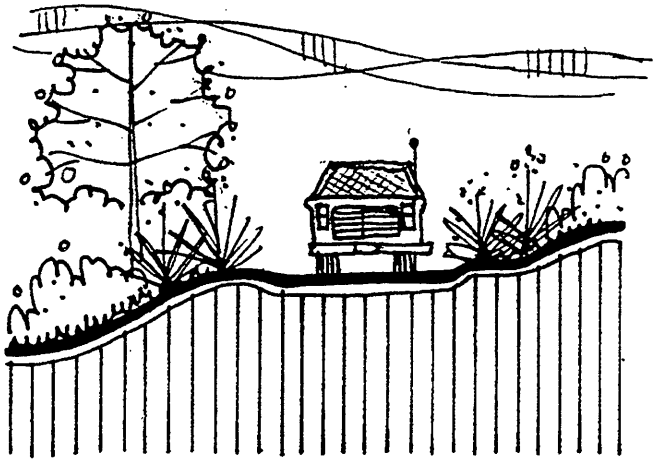
CONSTRUCTION STAGING/STORAGE AREAS SHOULD BE LOCATED OUTSIDE OF STREAMS



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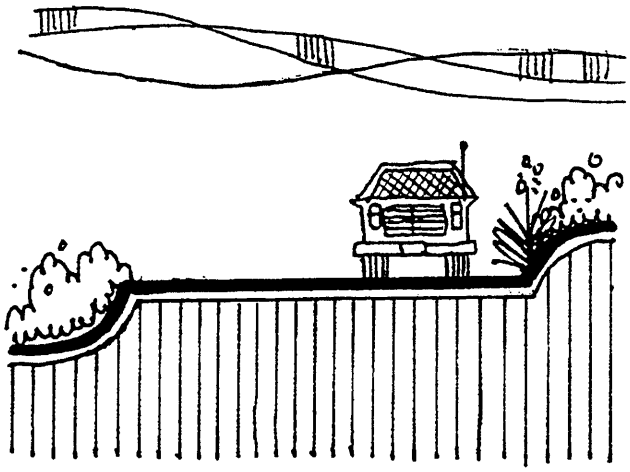

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ACCESS ROAD MAINTENANCE SHOULD NOT EXPAND THE EXISTING ROAD BED

FIGURE

Operational Protocol Diagrams

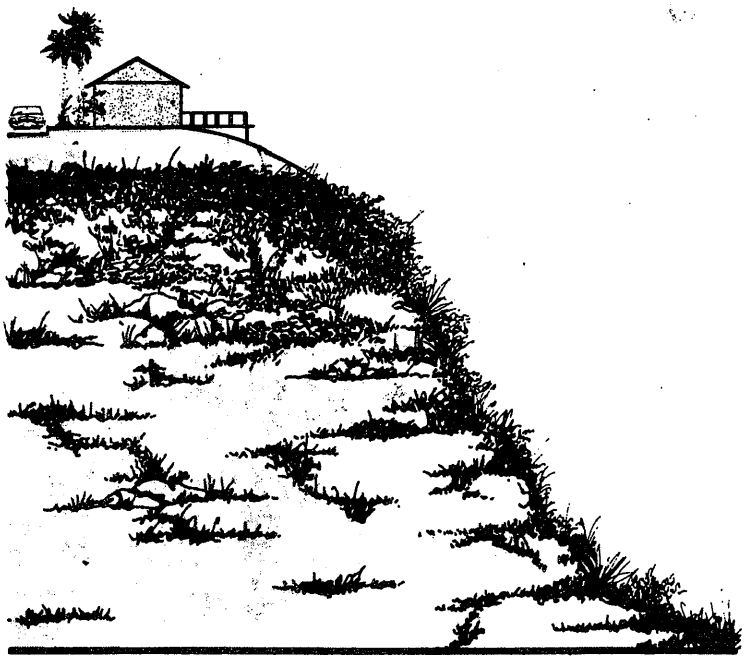
23

APPENDIX E

TECOLOTE CANYON RIM DEVELOPMENT GUIDELINES

TECOLOTE CANYON RIM DEVELOPMENT GUIDELINES

JANUARY 1987



Approved by
The Planning Commission
May 15, 1986

Adopted by
The City Council
January 13, 1987
Resolution No. R-267476

PLANNING DEPARTMENT
CITY OF SAN DIEGO, CALIFORNIA

TECOLOTE CANYON
RIM DEVELOPMENT GUIDELINES

On January 13, 1987, the City Council adopted the TECOLOTE CANYON RIM DEVELOPMENT GUIDELINES by Resolution NO. R-267476, and amended the Hillside Review Ordinance by Ordinance No. 0-16798 to require conformance to these guidelines when developing or reviewing projects in the HR areas around Tecolote Canyon.

TECOLOTE CANYON
RIM DEVELOPMENT GUIDELINES

Purpose and Intent

It is the purpose of these guidelines to be used in conjunction with the Hillside Review Overlay Zone in the area adjacent to Tecolote Canyon only. These guidelines shall be used in conjunction with the City-wide guidelines, Document No. R-262129, attached to the Hillside Review Overlay Zone ordinance. Together, the two sets of guidelines shall be used to provide direction for proposed development within the Hillside review Zone on property adjacent to Tecolote Canyon. The attached map defines the area which is Tecolote Canyon.

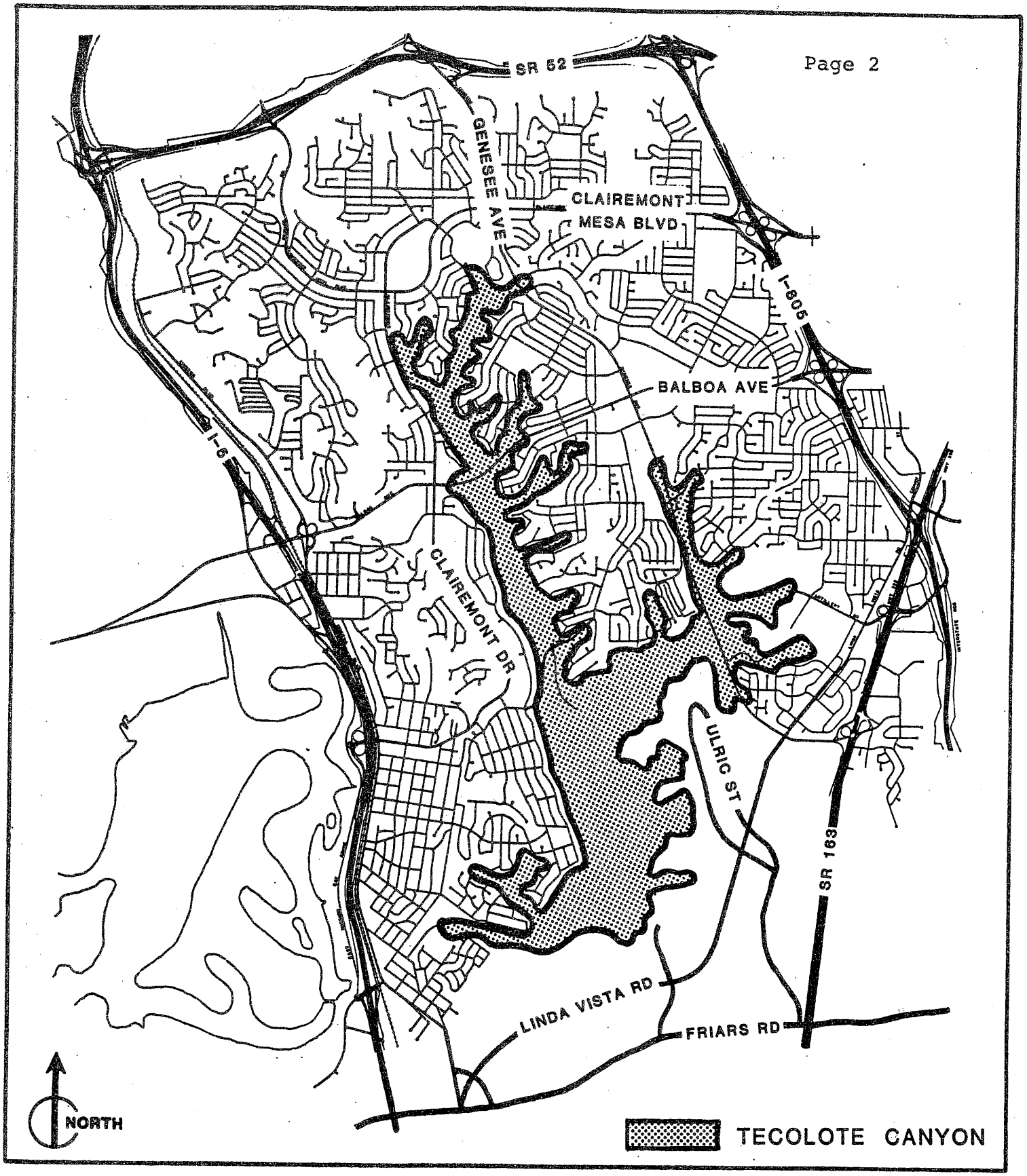
It is the intent of these guidelines to provide protection for the dedicated open space park known as Tecolote Canyon Natural Park. These guidelines will help to assure that development along the rim of Tecolote Canyon will occur in such a way that the native plant and animal habitat within the canyon is enhanced by and protected from damage by development along the canyon rim. Since Tecolote Canyon Natural Park is a regional facility preserving a portion of the native California habitat which is rapidly diminishing as urbanization spreads, the protection of this resource is an issue of both City-wide and regional importance.

The following guidelines apply to any new development along the rim of Tecolote Canyon, except as specifically exempted, which is subject to and requires a discretionary permit. Although most rim property is designated in the Linda Vista Community Plan and the Clairemont Mesa Community Plan for lower density development and zoned accordingly, there are some areas designated and zoned for higher intensities. The following guidelines should be applied to the review of projects being processed for Hillside Review Permits, Planned Residential Development permits, and Conditional Use Permits.

Single Family Exceptions

The following exceptions should apply to any development project involving one single-family structure with accessory structures located on a lot zoned for single-family development.

- Dedications for open space should not be required as part of a Hillside Review Permit.
- Dedications for public access should not be required as part of a Hillside Review Permit.
- Color and texture of building materials, so long as proposed materials are not in conflict with guidelines for Fire



TECOLOTE CANYON VICINITY MAP

Protection, should not be considered as part of a Hillside Review Permit.

Single Family Structures in Multi-Family Zones

A Hillside Review Permit should not be required for any addition or improvement to a single-family structure located on a lot zoned for multi-family development, which is partially or completely rezoned into the Hillside Review Overlay Zone according to C Sheet No. 715. However, any reconstruction to, redevelopment of, or new construction of multi-family structures on such lots should be subject to the requirement for a Hillside Review Permit.

Structures

- Structures located on the canyon rim should be low profile so as not to be visually prominent from the canyon floor.

- Structures should be set back or placed at staggered distances from the canyon rim to avoid a "wall effect" along the rim. In cases where the Tecolote Canyon Natural Park boundary is at a lower elevation than the canyon rim, structures should still maintain setbacks from the rim and utilize the area between the rim and park property lines as a landscaped buffer.

- The facades of structures should be angled at varying degrees to follow the course of the canyon rim. When viewed from the opposite rim of the canyon, the structures should emphasize the line of the canyon rim.

- In larger scale development projects there should be major breaks between structures to allow significant visual see-through and avoid a wall effect along the rim of the canyon.

- Rooflines of structures should vary in angle and height to provide a changing profile along the canyon rim when viewed from the opposite rim. A changing roofline will emphasize the verticality of the canyon walls and help blend the structures into the natural hillside environment.

- Building materials of color and texture which blend with the natural environment of the canyon should be used so that when viewed from the opposite rim, structures enhance rather than intrude on the view.

Traffic Circulation

- In larger scale development projects, pedestrian facilities rather than auto facilities should be located adjacent to the canyon rim as the scale of pedestrian facilities is more adaptable to the varying land forms of the canyon rim.

- Larger scale developments should provide appropriate pedestrian access to the canyon rim. Pedestrian facilities, such as lookout points and pathways, should be located in areas adjacent to the canyon rim, but should not provide access into Tecolote Canyon Natural Park.

- Where it is appropriate to locate roadways and driveways along the canyon rim, they should follow the natural course and contours of the rim. Landscaping should be provided to buffer roadways and driveways from the canyon. These buffered roadways and driveways would then provide open edges between the canyon and development.

- Where it is appropriate to locate parking facilities adjacent to the rim, they should be minimal in size and buffered from the canyon by landscaping.

- Traffic flow should be parallel to or directed away from the canyon rim. Adequate access for service and emergency vehicles into Tecolote Canyon Natural Park must be considered, but illegal off-road vehicles shall be excluded. Street layout and design should not create any pressure to construct new public roads through any part of Tecolote Canyon Natural Park.

Grading

- Grading should not occur within the canyon. If any areas within the canyon are disturbed by grading occurring adjacent to the canyon, or by minor grading necessary for the provision of services such as sewers or runoff control facilities, the disturbed areas should be repaired to blend in with natural slopes and contours and should be revegetated with native plants. Additionally, grading operations should not occur during the rainy season between October 1 and April 1 of any year.

- A serrated grading technique should be used on graded hillsides in order to help guarantee successful revegetation.

- Grading should be phased to allow prompt revegetation and reconstruction to control erosion.

- Grading into areas of native vegetation should be discouraged.

Drainage

- As part of development permit approval, a runoff control plan which would minimize runoff from the site should be approved by the City Engineer. Runoff control should be accomplished through the use of detention basins, siltation traps, energy dissipators or other effective means.

- Natural runoff patterns and water velocity should be maintained, unless a change would improve existing conditions.

- Runoff velocity should be non-scouring, non-erosive, and of a degree such that no armoring (e.g., rip-rap or concrete) of a channel is required.

- Runoff should be directed away from Tecolote Canyon. If runoff must be directed into the canyon, control measures should control runoff all the way to Tecolote Creek.

- Any areas on-site previously damaged by erosion should be repaired as part of the project.

- During construction, erosion and runoff control measures should be employed on an interim basis until a permanent control system has been implemented.

- Runoff and erosion control techniques should be based on techniques outlined in the Erosion and Sediment Control Handbook, California Department of Conservation, or in an equivalent resource document.

- As part of the project design process, applicants should consult with appropriate design and engineering professionals and with the Soil Conservation Service U. S. Department of Agriculture, when designing runoff and erosion control methods.

Landscaping

- Development along the canyon rim should be landscaped with species which blend in with natural vegetation. The scale of landscaping once it has matured should be compatible with existing mature vegetation and neighboring landscaping.

- Areas containing significant native vegetation (e.g., mature trees and shrubs) should be preserved.

- Revegetation programs should use "non-reseeding" species to hold soil until native vegetation can be established.

Fire Protection

- All development projects should incorporate fire protective measures in construction, site design, and landscaping at a level sufficient to provide reasonable protection for development located adjacent to high fire fuel load areas.

APPENDIX F

PARK AND RECREATION DIRECTOR'S LIST OF APPROVED PESTICIDES

Approved: _____ Park and Recreation Director

8/19/02 Date

Revised August 2002

PARK AND RECREATION DIRECTOR'S LIST OF APPROVED PESTICIDES

TYPE	CHEMICAL (TRADE NAME)	SIGNAL WORD	MANUFACTURER
Herbicide	Barrier	CAUTION	PBI / Gordon Corporation
	** Fusilade II	CAUTION	Zeneca Professional Products
	* Garlon*4	CAUTION	DowAgro Sciences Company
	Rodeo	CAUTION	Monsanto Company
	Aqua Master	CAUTION	Monsanto Company
	Roundup Pro	CAUTION	Monsanto Company
	** Roundup ProDry	CAUTION	Monsanto Company
	** Surflan	CAUTION	DowAgro Sciences Company
	** XL 2G	CAUTION	DowAgro Sciences Company or Helena Chemical Company
Insecticide	Dipel DF	CAUTION	Abbott Laboratories
	Dipel 2X	CAUTION	Abbott Laboratories
	M-Pede - Insecticidal Soap	WARNING	Mycogen Corporation
Miticide (Acaricide)	M-Pede - Insecticidal Soap	WARNING	Mycogen Corporation
Molluscicide	Metaldehyde Granules 3.5%	CAUTION	Amvac Chemical Corporation
Surfactant	*** No Foam A	CAUTION	Creative Marketing and Research, Inc.

* Approved for use by designated Park Ranger personnel and qualified volunteers under their direct supervision only.

** Approved for use by designated Balboa Park, Mission Bay Park and Shoreline Parks grounds maintenance personnel only.

*** For use with Rodeo herbicide.