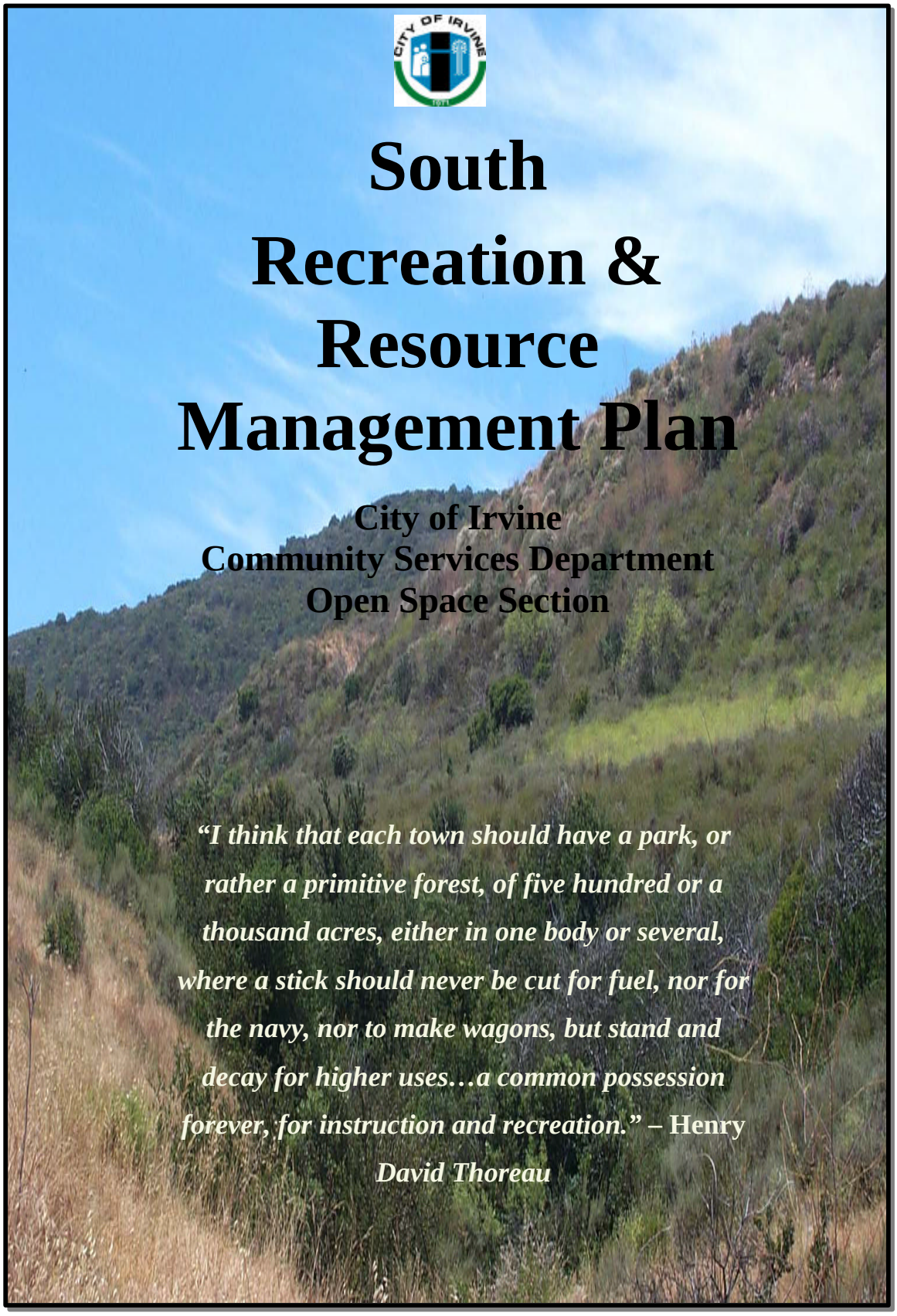

South Recreation & Resource Management Plan

City of Irvine
Community Services Department
Open Space Section

"I think that each town should have a park, or rather a primitive forest, of five hundred or a thousand acres, either in one body or several, where a stick should never be cut for fuel, nor for the navy, nor to make wagons, but stand and decay for higher uses…a common possession forever, for instruction and recreation." **– Henry** ***David Thoreau***

Mayor and City Council

Larry Agran, Mayor
Michael Ward, Mayor Pro-Tempore
Beth Krom
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CITY OF IRVINE
OPEN SPACE PRESERVE
South

Recreation & Resource Management Plan

Open Space Section: Mission Statement

The City of Irvine is dedicated to creating and promoting an awareness of our natural community, while encouraging behaviors that will ensure the preservation of our open space wilderness for generations to come. By engaging members of the community in positive outdoor recreational and educational experiences, we will manage and maintain Irvine's open space as a welcoming and valued part of our City.

Special Thanks To:

City staff would like to thank the following individuals for their time and their suggestions:

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The U.S. Fish and Wildlife Service

The California Department of Fish and Game

Acknowledgements

This document includes information compiled from the following sources:

- Architectural and Transportation Barriers Compliance Board, Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas
- California Parks and Recreation: Laura Westrup, Winter 2003, And Educating Trail Users: Advice for Planning Interpretive Trail Signs and Exhibits
- California State Trails Conference: Terry Palmisano, April, 1999
- City of Irvine: Environmental Impact Reports for Bommer Canyon and Planning Areas 22, 27, 17
- City of Irvine: Southern Open Space Conceptual Master Plan – Draft, 1998
- Conejo Open Space Conservation Agency Management Policies and Guidelines

Acknowledgements - *Continued*

- Conservation Biology Institute: Conservation Priorities for a Biodiversity Hotspot
- Crystal Cove State Park General Plan
- Laguna Coast Wilderness Park General Development Plan
- Laguna Coast Wilderness Park Resource Management Plan
- Laguna Laurel Stewardship Plan, Orange County, California: Prepared by The Nature Conservancy, The Irvine Company Open Space Reserve
- Natural Communities Conservation Plan and Implementation Agreement
- Nature Reserve of Orange County – Central/Coastal Subregion-Habitat Restoration and Enhancement Plan - Draft
- Nature Reserve of Orange County: 2001 Annual Report
- Regulatory Negotiation Committee on Accessibility Guidelines for Outdoor Developed Areas (1999), The Architectural and Transportation Barriers Compliance Board (Access Board).
- USDA Forest Service: Limits of Acceptable Change and Related Planning Processes

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Introduction

"I think that each town should have a park, or rather a primitive forest, of five hundred or a thousand acres, either in one body or several, where a stick should never be cut for fuel, nor for the navy, nor to make wagons, but stand and decay for higher uses…a common possession forever, for instruction and recreation." – *Henry David Thoreau*

STATEMENT OF PURPOSE

The City of Irvine will ultimately own over 4,000 acres of open space lands located in the southern portion of the city, and additional lands in the northern portion. In 2002, the city accepted the first 2,100 acres and now has responsibility for the management and operation of this land. As a signatory to the Central and Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan, the city has certain obligations under that plan and its Implementation Agreement.

One of those obligations is the preparation of a Recreation and Resource Management Plan prior to the establishment of permanent access, uses, or facilities. This Plan is prepared to address the future access uses and facilities for the City's Open Space Preserve – South. Additional plans will be prepared at a later date for areas in the north.

EXECUTIVE SUMMARY

The City of Irvine has a long established history of protecting and preserving large areas of valuable open space. In 1976, the City identified the need to establish and implement a mechanism to acquire and/or preserve natural open space land as an important component to the successful implementation of the City's General Plan.

A landmark ballot initiative overwhelmingly passed in 1988 that guaranteed important habitat areas would be consolidated and preserved through a phased land dedication program with The Irvine Company (TIC). To implement this initiative, the City of Irvine and TIC signed a Memorandum of Understanding (MOU) designed to protect and maintain the City's natural resources. The MOU identified specific areas of land to be preserved and dedicated to the City and stated the allowable land uses (preservation, passive recreation, and other activities compatible with the protection of the habitat).

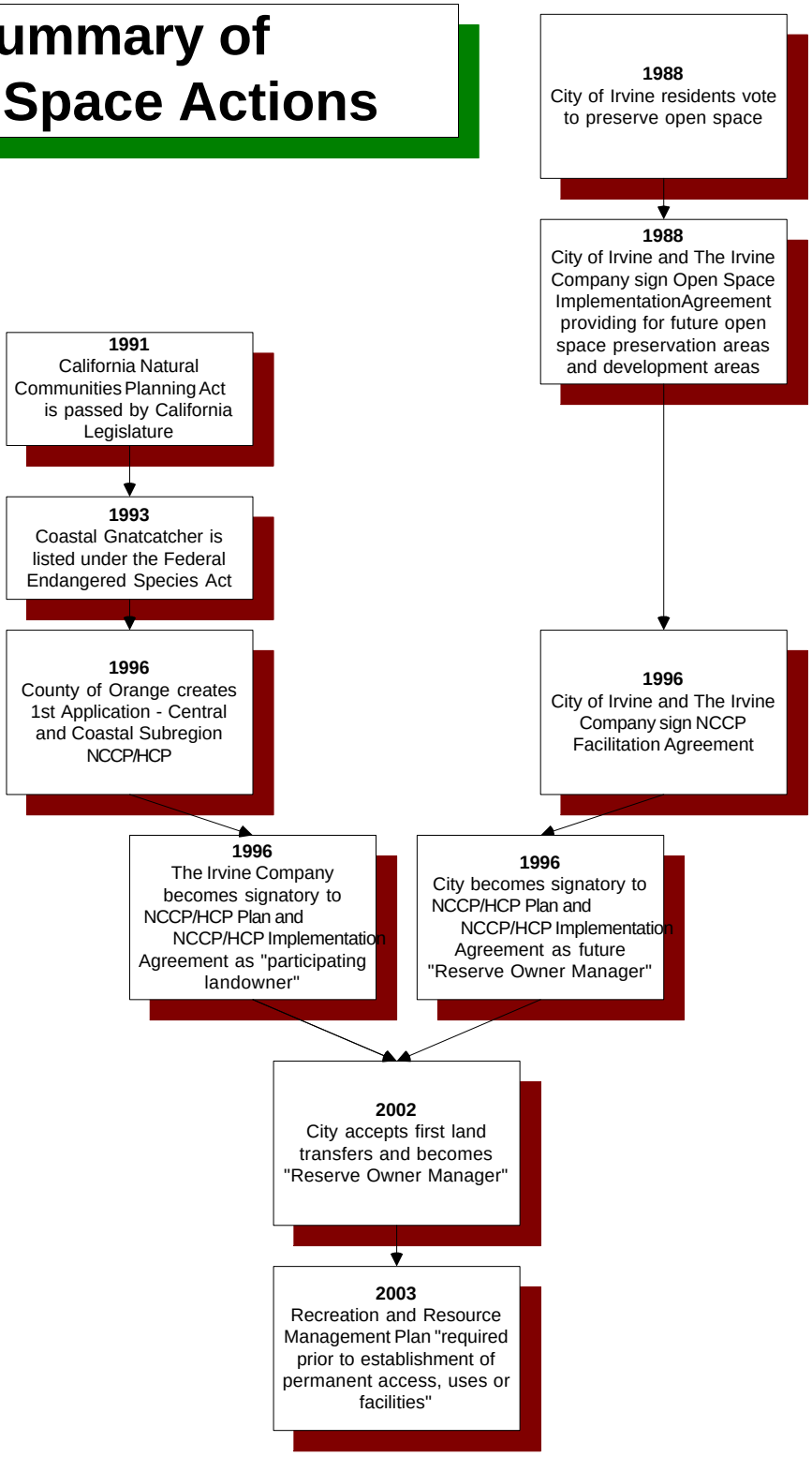
In 1991, the California Legislature enacted the Natural Communities Conservation Program (NCCP), which was prepared in response to, "a need for broad-based planning to provide for the effective protection and conservation of the state's wildlife heritage while continuing to allow appropriate development and growth." The purpose of the Natural Communities Conservation Program/Habitat Conservation Program (NCCP/HCP) was to create a multiple-species, multiple-habitat sub-regional Reserve System, and to implement a long-term "adaptive management" program that would protect coastal sage scrub (CSS) and other habitats and species located within the CSS habitat mosaic. The program was also designed to provide for economic uses to meet the social and economic needs of the people of the sub-region.

The City became a signatory to the NCCP and Implementation Agreement in 1996 along with twenty other participants including state, regional, local agencies and jurisdictions, affected landowners (including TIC), utility companies, and the University of California, Irvine. The Nature Reserve of Orange County (NROC) was created as a non-profit entity to manage the NCCP Reserve System.

The City of Irvine is a member of the NROC Board of Directors and participates in the quarterly board meetings and monthly subcommittee meetings. As a signatory to the NCCP, the City of Irvine is obligated to perform certain tasks related to the management of its open space land.

The City is required by the NCCP to prepare a Recreation and Resource Management Plan. This plan, contained herein, describes future access plans, permitted uses, planned trails and trailheads, and visitor facilities located within the habitat Reserve System. This plan will be submitted for review and recommendation to the City of Irvine's Community Services Commission, the City's Disability Advisory Board, the City Council, the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the NROC Board of Directors.

Summary of Open Space Actions



PROJECT LOCATION

The City of Irvine's Southern Open Space is located between I-405 Freeway and San Joaquin Hills Transportation Corridor. To the west, the open space is adjacent to Planning Area 27, Turtle Rock area and Planning Area 22. To the east, the open space is adjacent to the Planning Area 17 development, Laguna Freeway, and Laguna Coast Wilderness Park. A small portion of the open space is located east of Laguna Freeway.

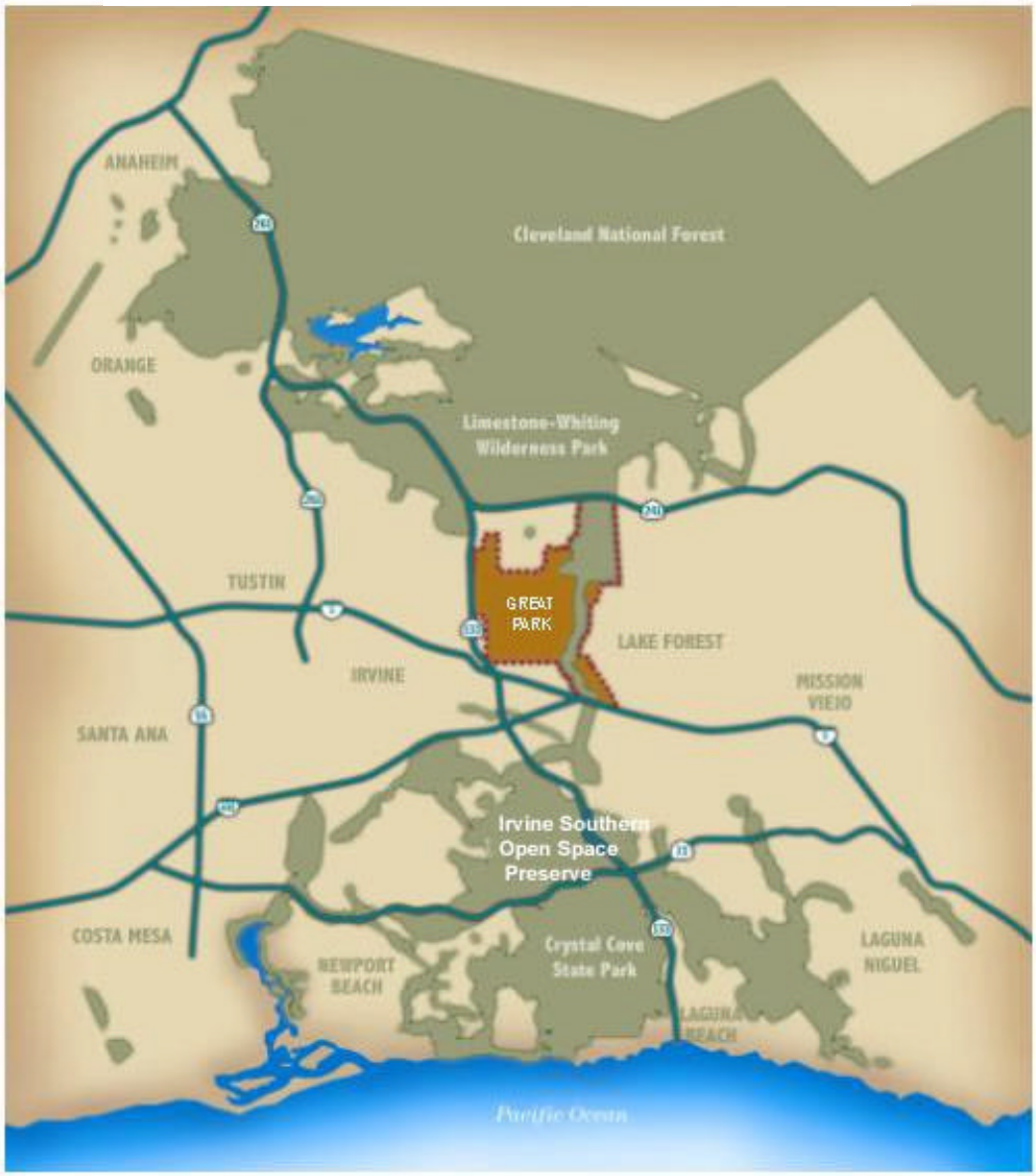
The Irvine Southern Open Space is adjacent to a larger open space system, as shown on the Regional Context Map (Exhibit A). Mason Regional Park is northwest of the project site. Laguna Coast Wilderness Park is to the south and southeast, directly adjacent to Irvine's Southern Preserve. Crystal Cove State Park is south of the project site. Los Trancos and Buck Gully, future County of Orange open space parcels, are located to the southwest. Los Trancos is designated to become part of the Laguna Coast Wilderness Park.

HISTORICAL OVERVIEW

Examination of Orange County's land use and population growth patterns from 1950 to the present indicates an increase in urban land uses and a corresponding decrease in conservation and open space areas. The early stages of urbanization focused on flat land areas such as agricultural lands, flood plains, and wetlands while later stages of development have focused on more rugged terrain such as hillsides. During this time regional land use policies resulted in the conversion of approximately 100 acres of conservation and open space areas to urban land uses per every 1,000 people added to Orange County's population.

Initially the effects on the environmental systems (biotic processes, geophysical forces, and human intervention) due to the conversion of undeveloped land to urban land uses were incremental and localized since there were thousands of acres of undeveloped land throughout the county.

EXHIBIT A
REGIONAL CONTEXT MAP



As development continued, the cumulative effects of urbanization on the environmental systems resulted in loss of diversity and disruption of linkages between the environmental systems.

The resulting loss of open space to urban land uses increased public awareness of these shrinking resources. Consequently, the need to properly manage and preserve undeveloped land as designated conservation and open space areas, and increase conservation and open space planning became a high public priority. In response to the changing priorities, especially during the late 1970s and 1980s, significant parcels of land were set aside throughout the county for preservation purposes. In 1976, the City identified the need to establish and implement a mechanism to acquire and/or preserve natural open space land as an important component to the successful implementation of the City's General Plan.

Open Space Initiative

On June 7, 1988, the residents of Irvine approved a landmark ballot initiative to preserve open space within the City of Irvine. The objectives of the Open Space Initiative were to:

- Consolidate important conservation and open space areas into large contiguous areas that may be integrated into local and regional open space areas.
- Establish a network of open space spines linking the consolidated conservation and open space areas.
- Assure the preservation and conservation of open space areas through a Phased Dedication and Compensating Development Opportunities Program, which transfers development opportunities from conservation and open space areas and consolidates them in appropriate development areas.

This initiative linked the dedication and conservation of open space areas to the development entitlement process. The purpose of the program is to provide for permanent protection of open space by means of public ownership. All major open space preservation areas will be secured with the completion of the phased land dedication program.

The Memorandum of Understanding and the Phased Land Dedication Process

Following passage of the Open Space Initiative, a Memorandum of Understanding (MOU) was crafted to implement the terms of the initiative. The MOU between the City of Irvine and The Irvine Company (TIC), was entered into on September 26, 1988. This MOU established the "phased dedication and compensating development opportunities program," also known as the "Implementation Action Plan." This plan specified that the dedication of open space will occur in stages related to the surrounding developments. The plan links specific development areas to specific open space districts and requires the dedication of the open space district when a certain entitlement threshold has been reached.

According to the MOU, there are two stages for the dedication of Irvine's open space:

1. The first stage is the recording of the tract map for the corresponding development. The preservation area in each of the lettered districts will be offered to the City upon recordation of the first subdivision map within the district.

2. The second stage is the issuance of building permits for 75% of allowed development in the district. The following table shows the list of lettered parcels with the total amount of open space acreage. The City may accept the land 90 days following the issuance of building permits for 75% of the development (residential units and non-residential square footage as shown on Exhibit 2 of the MOU), or upon completion of development in the district, whichever occurs first. The last phrase ensures that the City still receives the open space if TIC were to decide to build less than the allowed development in the district.

This program provides for permanent protection of significant, large scale conservation and open space areas by public ownership. Through this program, visually significant ridgelines and hillsides, significant biotic communities (e.g., Riparian, Marsh, and Oak Woodland), recreational lands, archeological and paleontological resources and areas subjected to geophysical and societal hazards are permanently preserved.

City of Irvine Land Ownership: Southern Open Space Preserve

Locations	2002-2003	2003-2004	2004-2005	2005-2006	Future Years	Cumulative Total
Bommer Canyon Shady Canyon West Newport Beach Parcels L, M, P-9, L-Detached	2,126 Acres Dedicated on May 18, 2002					2,126 Acres
Shady Canyon East Area K		57 Acres				2,183 Acres
Planning Area 17 Areas I & P-10			54 Acres			2,237 Acres
Quail Hill Area G				1,202 Acres		3,439 Acres
Areas H and J					605 Acres	4,044 Acres

Natural Communities Conservation Plan (NCCP)

The Natural Communities Conservation Planning Program (NCCP) was enacted by the California Legislature in 1991. The purpose of the NCCP is to preserve entire biotic communities while allowing compatible development and growth. This focus of the NCCP represents a dramatic shift from protecting “individual species" to protecting “habitat."

This program was designed as an alternative to the individual species protection under the state Endangered Species Act and the federal Endangered Species Act (FESA). Both of these protective programs were costly and historically ineffective as a mechanism for preventing plant and animal extinctions. The NCCP recognizes that habitat-based, multi-species or ecosystem-driven preservation programs have a greater potential for long-term environmental success.

Areas identified for their valuable biotic resources are also recognized under the Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP). The successful implementation of this plan allows for the conservation of large diverse areas of natural habitat for the California gnatcatcher and forty-one other “identified species” and their associated habitats.

In May of 1996, the City of Irvine, the County of Orange, various other cities and landowners entered into an agreement to place certain lands within the NCCP Reserve and to commit to specific responsibilities under this plan. Some of Irvine’s responsibilities include the following: consider adding General Plan amendments and ordinances to implement the NCCP/HCP, reviewing project proposals to ensure consistency with the NCCP, making efforts to acquire conservation easements from landowners not participating in NCCP, and formally committing city-owned lands to the reserve system.

Southern California Coastal Sage Scrub Program

The Southern California Coastal Sage Scrub (CSS) NCCP Program is the first effort to be undertaken pursuant to the NCCP Act. It is a pilot project and may serve as a model for other efforts elsewhere in the State. The Southern California Coastal Sage Scrub NCCP is made up of eleven subregions covering 6,000 square miles in a five county area. The Central and Coastal Subregion is one of the eleven subregions and encompasses 208,000 acres of developed, agricultural and undeveloped lands (an area encompassing about two fifths of the County of Orange). Within the Central and Coastal Subregion are 104,000 acres of natural biotic communities, including 34,392 acres of Coastal Sage Scrub. The City’s Southern Open Space Preserve comprises approximately 4,044 acres of this program.

Natural Communities Conservation Plan/Habitat Conservation Plan (NCCP/HCP)

The Natural Communities Conservation Plan (NCCP)/Habitat Conservation Plan (HCP) for the Coastal/Central Subregion was prepared by the County of Orange and was approved on July 10, 1996 by the County of Orange, participating local jurisdictions, the United States Fish and Wildlife Service, and the California Department of Fish and Game. As a signatory to the NCCP/HCP, the City of Irvine is required to adhere to the management guidelines outlined in the Implementation Agreement.

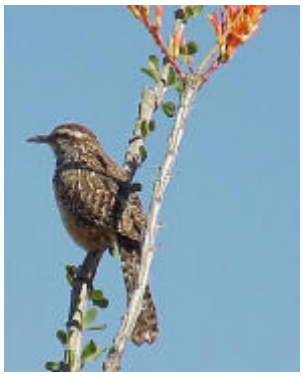
This program is intended to ensure the long-term survival of the plant and animal species in accordance with state-sanctioned NCCP program guidelines. Specific project purposes for the HCP are:

- Planning for the protection of multiple-species and multiple habitats within the coastal sage scrub habitat mosaic by creating a habitat reserve system that contains substantial coastal sage scrub, chaparral, grassland, riparian, oak woodland, cliff and rock, forest and other habitats;
- Developing a conservation program that shifts away from the current focus on the project-by-project, single species protection to conservation and management of many species and multiple habitats on a subregional level;
- Allowing social and economic uses within the subregion that are compatible with the protection of identified species and habitats;
- Protecting the federally-listed coastal California gnatcatcher in a manner consistent with Section 10(a) of the Federal Endangered Species Act and the Special 4(d) Rule for the gnatcatcher while providing for future incidental take of the species.

The NCCP/HCP guidelines designated three "target" species to be used as surrogates for planning purposes in the Coastal Sage Scrub habitat. Long-term protection of the habitat for these three target species is intended to also protect sufficient coastal sage scrub habitat to benefit a much broader range of coastal sage scrub-related species. The three species are:

Photo Credit: Credit: *U. S. Fish and Wildlife Service*
U. S. Fish and Wildlife Service/photo by Arnold Small

- California gnatcatcher (Polioptila californica californica)



Cactus wren (Campylorhynchus brunneicapillus)
Photo Credit: Credit: University of Edinburgh/College of Science and Engineering

Photo Credit: Credit: U. S. Geological Survey
U. S. Geological Survey/photo by Chris Brown

- Orange-throated whiptail lizard (Cnemidophorus hyperythrus beldingi)

A number of other habitat types and species were included in the NCCP/HCP planning process as "Covered Habitats" or "Identified Species." Covered Habitats refers to those habitat types protected by the NCCP/HCP in a manner comparable to coastal sage scrub. Identified Species include those species, including all life stages thereof, identified in the NCCP/HCP that are addressed as if they were listed as endangered species under the Federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA), and whose conservation and management is provided for in the NCCP/HCP.

Land management actions within the reserve will be monitored closely and modified (adapted) over time to respond to new scientific information, changing conditions and habitat needs.

The Nature Reserve of Orange County

The first application of the NCCP/HCP in the central/coastal subregion of Orange County was the establishment of The Nature Reserve of Orange County, a 37,000 acre area designed to protect the habitat of coastal sage scrub communities and the three target species found predominantly in this habitat. The Reserve will protect more than 18,800 acres of coastal sage scrub (CSS).

The Reserve also includes 7,300 acres of chaparral; 6,100 acres of grassland; 1,800 acres of riparian; 950 acres of woodland; 200 acres of forest habitat; and significant portions of six other habitats that currently exist in the subregion. Inclusion of these non-CSS habitats and their resident species will increase its biodiversity value and result in a multiple-species, multiple habitat reserve.

The reserve will be owned and managed by public agencies and administered by a Non-Profit Management Corporation consisting of representatives from each of the following:

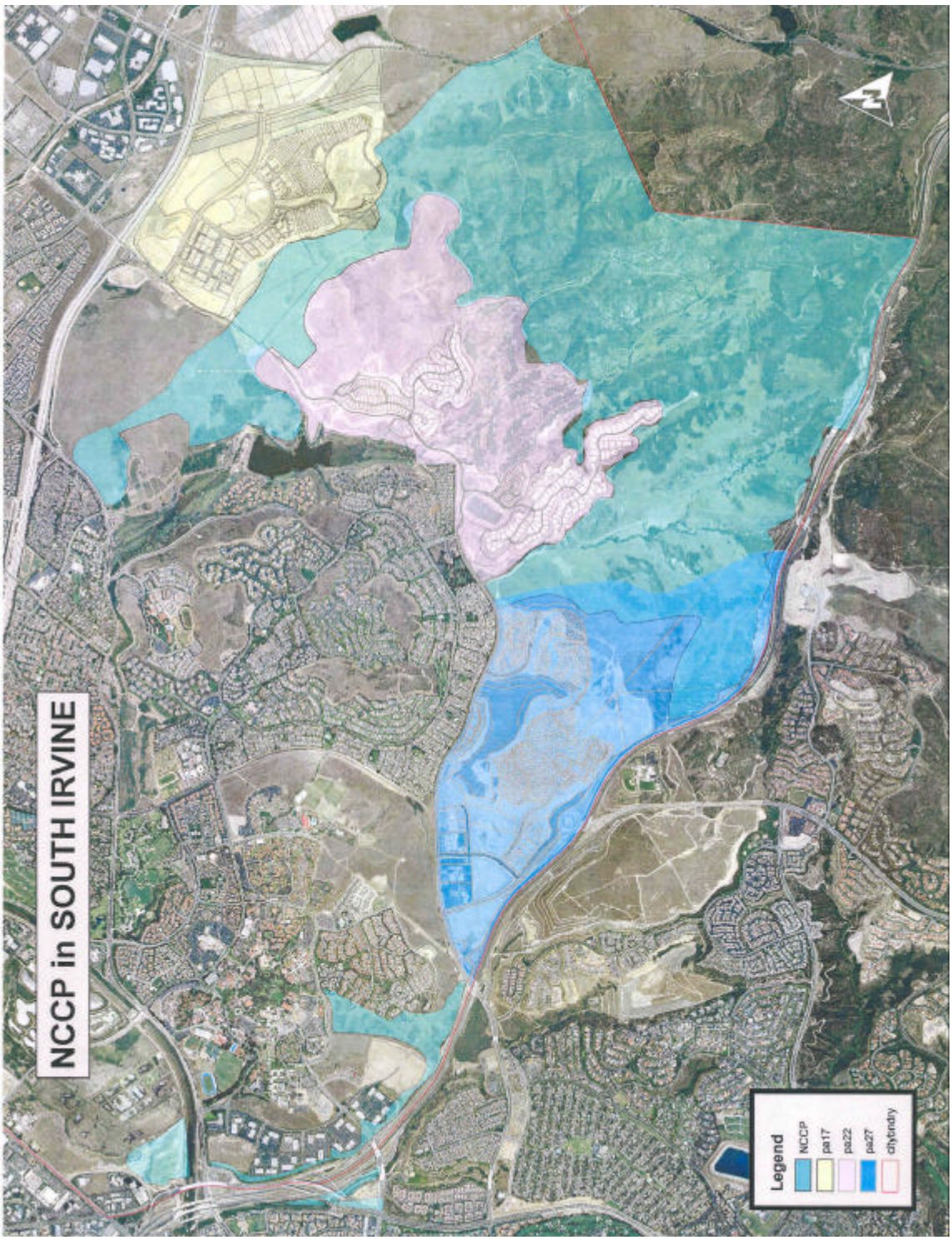
- Each local Government owning land in the reserve (to date includes City of Irvine and City of Laguna Woods)
- Southern California Water District
- Irvine Ranch Water District
- Southern California Edison
- Metropolitan Water District

- Transportation Corridor Agency
- California Department of Parks and Recreation
- California Department of Fish and Game
- United States Fish and Wildlife Service
- Regents of the University of California
- Each non-profit entity owning land within the Reserve
- Three public representatives appointed by the Board of Directors
- Non-voting ex-officio member representing the California Department of Forestry
- Non-voting ex-officio member representing the Orange County Fire Authority

The Non-Profit Corporation will coordinate activities within the reserve system, receive and disburse funds to reserve owners/managers, hire staff and biologists to conduct adaptive management activities and prepare annual reports for public review.

The Irvine Southern Open Space is enrolled in the Central and Coastal Subregion NCCP Program and is within The Nature Reserve of Orange County.

Exhibit B
NCCP Overlay Map



Public Participation Process

The City of Irvine conducted an extensive public participation process beginning in 1996. This process took the form of a Conceptual Master Plan. An Irvine Southern Open Space Conceptual Master Plan Committee was formed consisting of Irvine residents, City staff, special interest groups and members of The Nature Conservancy. A draft City of Irvine Southern Open Space Conceptual Master Plan (CMP) was prepared by RJM Design Group, Inc. in 1998 and updated in August 2000. The CMP included public and staff participation and documents the proposed concepts for development, preservation, and recreation activities and facilities within the boundaries of the preserve. The CMP served as a basis for planning and specific aspects of it have been included in this document.

REVIEW AND APPROVAL PROCESS

The City of Irvine's Southern Open Space Recreation and Resource Management Plan will be submitted for review and comment to the City of Irvine's Community Services Commission then forwarded to the Irvine City Council for approval. The document will also be reviewed for inclusion of accessibility components.

After City approval is received, the document will be submitted for approval to the California Department of Fish and Game, the U.S. Fish and Wildlife Service, and the Nature Reserve of Orange County

UPDATES AND AMENDMENTS

City Staff will review the City of Irvine's Recreation and Resource Management Plan periodically.

Open Space Dedication Event: May 18, 2002

Bommer Canyon Cattle Camp

Recreation & Resource Management Plan

Existing Conditions

Existing Conditions

As a consequence of development in this area, some native habitats have been modified, while others, in the steeper hills and canyon bottoms, remain undisturbed. In addition, the San Joaquin Hills provide an important link to larger regional habitat areas including Laguna Canyon, Laurel Canyon, Crystal Cove State Park, and the Irvine coastal dedication area. The Irvine Open Space Preserve contains the biotic communities listed below:

1. Freshwater marsh
2. Riparian
3. Coastal sage scrub
4. Chaparral
5. Oak woodland
6. Agricultural
7. Introduced grassland

Key societal features include the former Coyote Canyon landfill; archaeological, historical, and paleontological resources; agricultural row crops (Planning Areas 17 and 18); and, residential and industrial development.

TOPOGRAPHY

The Irvine Open Space Preserve is located within the San Joaquin Hills in the northwest portion of the peninsular ranges geomorphic province. The San Joaquin Hills parallel the Pacific Ocean and form the City of Irvine's southern boundary. The area consists of rolling terrain with moderately steep slopes, canyons, and narrow ridges. Other significant geological features are spectacular rock outcroppings, many of which contain eroded sandstone caves; the Shady Canyon fault; Bommer and Shady Canyons; and Quail Hill. The highest geographical point of the Preserve is located near the southwest corner of the project, adjacent to the toll road (Hwy 73),and is approximately 1,050 feet above sea level. The lowest geographical point is located near University Drive and I-405 Freeway and is 125 feet above sea level.

GEOLOGY AND SOILS

The project site is located within the San Joaquin Hills, which are in the extreme northwestern end of the Southern California Peninsular Range. The area includes tertiary sedimentary rocks with both marine and nonmarine origins, representing oscillations in an ancient sea level.

The preserve area is a series of northwest-rending hills underlain by Paleocene through early-middle Miocene sedimentary rocks locally intruded in the late-middle Miocene by igneous andesites and diabases and capped by Pleistocene and Holocene surficial deposits. Major features of the present topography and geomorphology are the result of late Miocene faulting and regional uplift of the San Joaquin Hills.

The sedimentary formations (from youngest to oldest) are as follows:

- Topanga Formation, Los Trancos Member, of early-middle Miocene age
- Topanga Formation, Bommer Member, early-middle Miocene
- Sespe Formation (nonmarine)/Vaqueros Formation (marine), late Eocene to early Miocene
- Silverado Formation, Paleocene age

Surface soils include non-marine terrace deposits, alluvium, colluvium, and landslide deposits. Several landslide areas occur within the preserve, associated with Topanga, Sespe, and Vaqueros formations.

A significant portion of the watershed is covered with Hydrolic Soil Group "D." This type of soil is highly impermeable and has infiltration rates slightly higher than pavement. Rill and gully formation caused by grazing activities, in addition to surface erosion, are the principal sources of sediment yield. The fires of 1993 have accelerated this process.

Numerous inactive faults are located within the immediate region of the preserve, including Pelican Hill, Laguna Canyon, and Shady Canyon Faults. The faults are northwest trending right-lateral, and parallel the Newport/Inglewood Fault Zone. The nearest active fault, the Newport-Inglewood fault lies approximately 6 miles SW. Other active faults that have generated the strongest historical earthquakes nearest to the project site include the San Andreas, San Jacinto, and Elsinore faults, and the Elysian Park thrust.

HYDROLOGY

Primary source of water for the park is rainfall and runoff from surrounding lands. Because of low rainfall, runoff is not consistent. Plants and animals in the park have adapted to the xeric conditions. Annual grasslands have a short life span, mainly during the winter months. Oak woodlands occur in moist canyons and cool microclimates where they develop deep taproots to collect groundwater.

San Diego Creek Watershed is the main watershed within the preserve, with streams flowing in a northerly direction to San Diego Creek. Shady and Bommer Creeks and their tributaries drain into Sand Canyon Reservoir, which in turn discharges into Sand Canyon Wash. Sand Canyon Wash drains into San Diego Creek which flows into Upper Newport Bay. Small portions of the preserve may also be a part of the Laguna Canyon Watershed, with stream flows in a southerly direction to the Pacific Ocean.

Several reservoirs are located in the vicinity of the site and receive runoff from the site:

- *Sand Canyon Reservoir* is formed by a 58-feet high embankment dam constructed in 1942. It is owned by the Irvine Ranch Water District (IRWD) and is being used to store reclaimed water. In order to satisfy the increased demand for storing reclaimed water, IRWD has studied the feasibility of raising the dam or constructing a new one in the upstream watershed.

- *San Joaquin Reservoir*, owned by the Metropolitan Water District, is located outside of the city limits, south of San Joaquin Hills Transportation Corridor adjacent to an open space parcel.

- *Bonita Reservoir* is no longer used for water storage purposes, and was dedicated to the City as part of the Planning Area 26 open space.

BIOLOGICAL RESOURCES

This section documents the general biological character of the Open Space Preserve in terms of plant communities, wildlife habitats, wildlife movement corridors, and sensitive biological resources, either present, or potentially present onsite.

The information contained in this section is based on the biological surveys that were prepared for planning areas 17, 22, and 27 as part of the Environmental Impact Reports for these areas.

In 1993, the Laguna Beach Fire burned over 14,300 acres of natural vegetation in the San Joaquin Hills (Bontrager et al. 1995), including most of the vegetation communities in the project site. Prior to the fire, the project site was dominated by coastal sage scrub, chaparral and grassland habitats. Oak woodland, riparian woodland and marsh habitats were present, but not extensive. None of the habitats were in pristine condition, as cattle have been grazing the area for approximately one hundred years. This study, and others conducted in the burn area since the fire (Harmsworth Associates 1996, 1997) indicate that the current vegetation communities dominate approximately the same locales they dominated prior to the fire. Grassland and woodland habitats appear to have returned to pre-fire levels in terms of both distribution and density. Coastal sage scrub and chaparral habitats, although occupying the same general arm as prior to the fire, currently have lower shrub densities and lower shrub cover than mature communities. These habitats are currently more open than before the fire.

Exiting Vegetation and Wildlife

Vegetation Types
The distribution of recorded plant species consists of the primary native plant communities described below.

- **Coastal Sage Scrub**

  Coastal sage scrub (CSS) is a community of low growing, soft woody drought-deciduous sub-shrubs and herbaceous plants that typically grow on thin, rocky soils in southern California. Coastal sage scrub is considered a special status vegetation type because of its high potential to support Threatened and Endangered wildlife species. Coastal Sage scrub consists of two associations: 1) sagebrush and sage scrub, and 2) southern cactus scrub.

  The sagebrush and sage scrub community occurs on hillsides in a variety of soil types. The community is dominated by California sagebrush *(Artemisia californica)* and California buckwheat *(Eriogonum fasciculatum).* Sage brush and sage scrub were found in varying stages of post-fire succession with dominant and sub-dominant representative species including black sage *(Salvia mellifera),* encelia *(Encelia californica),* white sage *(Salvia apiana),* and monkeyflower *(Mimulus aurantiacus).* Lemonadeberry *(Rhus integrifolia),* toyon *(Heteromeles arbutifolia),* laurel sumac *(Malosma laurina)* and Mexican elderberry *(Sambucus mexicana)* were scattered on the more mesic northeast facing slopes and in the bottoms of the shallow drainages.

  The southern cactus scrub occurs in scattered patches throughout the project site. These patches are comprised of a minimum of 30 percent cover of cactus species. The southern cactus scrub on the project site is dominated by coastal prickly pear cactus *(Opuntia littoralis)*. Other species present include Mexican elderberry, California sagebrush, and California buckwheat.

- **Grassland**

  Native grassland includes the southern coastal needlegrass grassland. In its pristine condition in Southern California, native grassland was dominated by purple needlegrass and a perennial bunchgrass. Historically (pre-European settlement), valley needlegrass grassland covered as much as 17 percent of California (Keeley 1989) but has been greatly reduced by the invasion of non-native annual grasses and forms of Mediterranean origin, changes in the kinds of animals and their grazing patterns, cultivation, and fire (Heady 1977). Only 0.1 percent of historic perennial native grasslands in California is extinct (Barry 1981). Due to its reduction in range native grasslands are considered a special status vegetation type.

The grasslands consist of low herbaceous vegetation dominated by a variety of native and non-native grass species. There are five different associations of grasslands identified in the preserve. The associations and their dominant plant species are as follows:

(1) annual grassland dominated by slender wild oat *(Avena barbata),* red brome *(Bromus rubens), soft* chess *(Bromus hardaceus),* and hare barley *(Hordeum leporinum);*

(2) wild rye grassland dominated by beardless wild-rye *(Leymus triticoides)* with purple needlegrass *(Nassella pulchra),* slender wild oats, and other annual grasses and forbs;

(3) southern coastal needlegrass grassland dominated by nonnative grasses *(Stipa spp.),* forbs, and doveweed *(Eremocarpus setigerus);*

(4) ruderal grassland; and

(5) alkali grassland dominated by giant wild rye (Leymus condensatus), western ragweed *(Ambrosia psilostachya),* curly dock *(Rumex crispus),* and annual grasses.

- **Sage Scrub-Grassland Ecotone/Sere**

Sage scrub-grassland ecotone/sere is found in the native needlegrass grassland and usually provides the grassland component of scrub-grasslands. In some situations, these areas may represent a "sere" (early successional stage of the sagebrush and sage scrub community). There are five subtypes within this broad community, four of which occur on the project site. These subtypes are: sagebrush grassland; coastal goldenbush-grassland; box springs goldenbush-grassland; and mixed sage scrub-grassland. All subtypes are named according to their dominant plant species with the exception of the mixed sage scrub-grassland which has no clearly dominant shrubs or sub-shrubs.

- **Riparian Vegetation**

The riparian vegetation in the area, including southern willow scrub and mule fat scrub, occurs along drainages that are typically subject to seasonal flooding.

Riparian habitats provide habitat for a wide diversity of wildlife species. Cattle have extensively damaged the lower branches of trees and trampled the understory vegetation in drainage courses throughout the flatter portions of the preserve. This, combined with rapid runoff from grazed slopes has led to significant erosion of the lower portions of the site's major drainages.

There are eight different associations of riparian habitats within the Preserve. The associations and their dominant plant species are as follows:

(1) Herbaceous riparian is dominated by annual, biennial, and perennial species that may or may not succeed to riparian scrub, woodland and forests. It is represented by rabbitfoot grass *(Potypogon monspeliensis),* salt-grass *(Distichlis spicata),* three-square rush (Scirpus pungens), common toad rush *(Juncus bufonius),* water speedwell *(Veronica anagallis-aquatica),* western yellow-cress *(Rorippa curvisiliqua),* seep monkey flower *(Mimulus guttatus),* water smartweed *(Polygonum lapathifolia),* rushes *(Juncus spp.),* sedges (Scirpus spp.), ragweed, mugwort (Artemisia douglasiana), stinging nettle (Urtica bolosericea), curly dock, and cocklebur (Xanthium strumarium var. canadense).

(2) Willow riparian scrub is dominated by arroyo willow *(Salix lasiolepis)* and mulefat *(Baccharis salicifolia)* with lesser amounts of red (S. Idevigata) and black willows (S. gooddingii). The herbaceous understory components included brome grasses *(Bromus spp),* sweet-clover *(Melilotus spp.),* mugwort *(Artemisia douglasiana)* and western ragweed *(Ambrosia psilostachya).*

(3) Mulefat scrub is dominated by mulefat (Baccharis salicifolia) with an understory of caterpillar phacelia *(Phacelia ramosissima),* grasses and herbaceous riparian species. Other native species associated with mulefat scrub were western ragweed and mugwort.

(4) Sycamore riparian woodland is dominated by California sycamore (Platanus racemosa) with coast live oak *(Quercus agrifolia),* mexican elderberry, and a sub-canopy of willow and mulefat. Openings in the community were occupied by herbs and shrubs such as annual grassland species, giant wild-rye *(Leymus condensatw),* and poison oak.

(5) Coast live oak riparian woodland is dominated by coast live oaks (*Quercus agrifolia*) lining the drainage and supporting an understory of herbaceous riparian species, grasses, poison oak, Mexican elderberry, toyon and laurel sumac. Coast live oak riparian forest integrated with sycamore riparian woodland downstream and coast live oak woodland in upland areas. Coast live oak riparian forests occupied 11.9 acres of the canyon bottom in upper Bommer Canyon, and also occur in other areas of the Open Space.

(6) Arroyo willow riparian forest dominated by arborescent arroyo willows;

(7) Blackwillow riparian forest dominated by black, arroyo, and red willows, and Mexican elderberry; and

(8) Bramble thicket dominated by perennial vines and bushes.

- **Chaparral**

  Chaparral is an assemblage of medium height to tall, evergreen, dark green sclerophyll-leaved species that are adapted to fire. Chaparral was dominated by one or more of the following species: laurel sumac, toyon *(Heteromeles arbutifolia)*, lernonadeberry, Mexican elderberry *(Sambrucus mexicana)*, and poison oak *(Toxicodendron diversiloba).* Coastal sage scrub species such as sagebrush, white sage and monkeyflower intergrade with chaparral species on the steep, mesic north facing slopes.

- **Seasonal Wetlands**

  Freshwater seeps (vernally moist areas) are scattered throughout the site. The seasonal seeps are a result of water brought to the surface because of rock outcrops, allowing wetland vegetation to develop. Dominant plant species observed onsite include needle spikerush (Eleocharis aciculatis), wire rush (Juncus balticus), long-leaved rush (Juncus macrophyllus), Mexican rush (Juncus mexicanus), curly dock, narrow-leaved milkweed (Asclepiasfasciculafis), foxtail fescue (Vulpia nzyuros), and Italian ryegrass (Lolium mulfiflorum).

- **Marsh**

  Freshwater marsh is located in the lower stretch of the Bommer Canyon main drainage (in the southwestern corner of the site), and at a watering hole straddling the western boundary of Planning Area 22. Wallowing cattle have severely impacted the marsh vegetation in these areas. Plant species associated with these areas include common poison-hen-dock (Conium maculatum), seep monkeyflower (Mimulus gwatus ssp. guttatus), African brass-buttons (Cotula coronopifolia), smooth umbrella-sedge (qperus laeWgatus), needle spike-rush, Olney's bulrush (Scirpusameficanus), duckweed (Lemna sp.), barnyard grass (Echinochloa crus-galli), and cattails (Typha spp.).

- **Woodland**

  Coast live oak woodland is located on gradual to moderate north facing slopes and in shallow drainages. The community was dominated by coast live oak with associated species including toyon, holly-leaf redberry, Mexican elderberry, and poison oak. Chaparral and coastal sage scrub intergrade with the oak woodland community and often composed a percentage of the shrub understory. An herbaceous understory consisted of annual and needlegrass grassland species, melic grass *(Melica imperfiecta)*, and common chickweed *(Stellariamedia).*

- **Cliff and Rock**

Rock outcrops occur in association with every major plant community on the site. In scrub and chaparral communities, only the most substantial outcrops occurring are mapped as a separate community. Rock outcrops support lichens (Cryptogrammae) and a wide variety of plant species. Species commonly associated with outcrops include Bigelow's spike-moss *(Selaginella bigeloWi),* pine golden bush *(Eficameria pinifolia),* cudweed aster *(Lessingia filaginifolia),* cacti *(Opuntia spp.),* sand mat *(Cardionema ramossissimum),* pigmy stonecrop *(Crassula errecta),* dudleyas *(Dudleya spp.),* California wishbone bush *(Mirabilis* californica), Nuttall's snapdragon *(Antirrhinum nuttallianum),* and purple needlegrass.

- **Lakes, Reservoirs, and Basins**

Several areas of open water were identified within the Southern Open Space, as follows:

(1) Planning Area 22 includes approximately 0.9 acre of open water within Sand Canyon Reservoir and associated lakeshore habitat (generally unvegetated or sparsely vegetated).

(2) A soft bottomed retarding basin covering 1.7 acres exists at the lower end of Bommer Canyon and supports only weedy herbaceous plants.

(3) A 0.9 acre man made water impoundment/basin occurs in the northeastern portion of Planing Area 17 in the NCCP Reserve. The edges of the basin support limited amounts of wetland indicator species, such as cattail *(Typha spp.),* rabbitfoot grass, and cocklebur *(Xanthium strumarium),* suggesting water level fluctuations. Mud flats were the dominant feature within the community.

- **Watercourses**

Watercourses include small rock pools, deeper basins, and unlined flood control channels. Small rock pools or "tenajas" have formed along two of the project site's seasonal drainages. The deeper basins are several feet deep and retain water well into the summer, providing a source of drinking water for wildlife and breeding habitat for the western spadefoot, a sensitive amphibian species. Unlined flood control channels are either completely unvegetated or infrequently vegetated with herbaceous riparian species, insufficient to be classified as herbaceous riparian. A number of other smaller drainage courses also exist onsite but have been characterized as habitats other than watercourses.

Wildlife Species

The Preserve supports a wide diversity of wildlife species. This diversity is expected, given the site's relatively large size and its location within a substantial block of natural open space in the San Joaquin Hills. This section describes the wildlife species potentially found within the preserve.

- **Amphibians**

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although the drainages on the project site are dry for much of the year, a number of amphibian species occur or potentially occur even in the more xeric (i.e., dry) habitats. Terrestrial species may or may not require standing water for reproduction. These species are able to survive in dry areas by remaining beneath the soil in burrows or under logs or leaf litter, emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and the slope aspect.

Five native amphibians were identified at the site: arboreal salamander, pacific slender salamander, pacific treefrog, western toad, and western spadefoot. The riparian vegetation types present are expected to support populations of common amphibian species such as the Pacific chorus frog (*Hyla regilla*) and western toad (*Bufo boreas*). The African clawed frog, an introduced pest species that is harmful to many native amphibian populations, was found in the perennial stream in lower Bommer Canyon. One introduced bullfrog was heard at Sand Canyon Reservoir. The California redlegged frog could also occur on the site.

- **Reptiles**

Reptilian diversity and abundance typically varies with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover and protection from predators and extreme weather conditions.

The southwestern pond turtle was also observed at Sand Canyon Reservoir in the fall of 1993. Western fence lizards are abundant throughout the site. Side-blotched lizards and western whiptails are occasionally present in areas with looser soils, and southern alligator lizards occur around drainages and other moist areas. Western skinks are found in rocky areas in coastal sage scrub habitat. Snakes observed on the site include the coachwhip, California whipsnake, gopher snake, northern red diamond rattlesnake and the western rattlesnake. Many more reptile species are expected to occur on the site, including the San Bernardino ringneck snake, common kingsnake, striped racer.

- **Birds**

Birds are the most commonly observed vertebrate taxon on the project site. Although many species can be observed in multiple habitat types, the vegetation types present on the project site have been organized in the following manner in order to discuss the more

common bird species. Raptors (birds of prey) use a wide variety of habitats for nesting and foraging; therefore, these birds are discussed separately at the end of this section.

Coastal Sage Scrub vegetation on the project site supports an avifauna that is comprised of species adapted to the dense, low vegetation that typifies these areas. Although a large number of individuals may be found on the project site, species diversity is low to moderate, depending on the season. A relatively high number of birds breeding in coastal sage scrub habitat are permanent residents. Bird species common to coastal sage scrub habitat and observed on the site are California quail (*Callipepla californica*), Bewick's wren (*Thryomanes bewickii*), wrentit (*Chamaea fasciata*), California towhee, and spotted towhee (*Pipilo maculatus*). Less common inhabitants of this vegetation type that were observed include the cactus wren (*Campylorhynchus brunneicapillus*) and rufous-crowned sparrow (*Aimophila ruficeps*). During winter months, coastal sage scrub vegetation provides habitat for a number of species that migrate from breeding grounds further north. Common winter residents expected to occur in this habitat on site are the White-crowned sparrow (*Zonotrichia leucophrys*), Lincoln's sparrow (*Melospiza melodia*), and hermit thrush (*Catharus guttatus*). The Costa's hummingbird (*Calypte costae*), observed during the surveys, is a migratory species that is only present during the summer season.

Agricultural Habitats often support large numbers of a few species and provide excellent foraging habitat for a variety of raptors. Common summer residents observed during the surveys include rock dove (*Columba livia*), horned lark (*Eremophila alpestris*), European starling (*Sturnus vulgaris*), western meadowlark (Sturnella neglects), and Brewer's blackbird (Euphagus cyanocephalus). Common species expected to be present during the winter season include the mourning dove (*Zenaida macroura*), American pipit (*anthus rubescens*), red-winged blackbird (*Agelaius phoeniceus*), white-crowned sparrow, and house finch.

Upland Scrub associations provide important habitat for a variety of nesting bird species, most notably the coastal California gnatcatcher and coastal cactus wren, which are sensitive species with concentrated populations in the hills surrounding Sand Canyon Reservoir. Other nesting species in upland scrub habitats include the California quail, greater roadrunner, Costa's hummingbird, Bewick's wren, lazuli bunting, California towhee, and Southern California rufous-crowned sparrow.'

The site's extensive rock outcrops provide habitat for several nesting pairs of rock wren, as well as canyon wrens. Winter visitors observed in the site's upland scrub and rock outcrop communities include golden-crowned and white-crowned sparrows.

Toyon-Sumac Chaparral provide habitat for many resident and wintering species. Residents include Anna's hummingbird, scrub jay, house wren, wrentit, California thrasher, orange-crowned warbler, and rufous-sided towhee. Western migrant warblers are frequently encountered in local chaparral communities; species encountered on the site include Townsend's, MacGillivray's, and Wilson's warblers. Expected wintering

species include the ruby-crowned kinglet, hermit thrush, yellow-rumped warbler and fox sparrow.

Grasslands and Agricultural Areas: Raptors (birds of prey) are common in the area, foraging primarily in the site's grasslands. Nests of red-tailed hawk and American kestrel were found on the site in large sycamore trees surrounded by grasslands. Other raptor species observed on the site that forage primarily in grasslands include the white-tailed kite, northern harrier, barn owl, and great horned owl. The owls are expected to nest on the project site; the kite and harrier are known to nest in the project vicinity, and two pairs of kites, one pair exhibiting courtship behavior, were observed within the northern arm of Shady Canyon (April 20, 1994). However, no active nests were observed on the site. Other residents and summer residents found in the site's grasslands and agricultural areas include the killdeer, common grounddove, Say's phoebe, western kingbird, California homed lark', loggerhead shrike', lark sparrow, grasshopper sparrow', western meadowlark, and European starling. Expected wintering species include the American pipit, Oregon vesper sparrow, and savannah sparrow.

Riparian Woodland: The preserve's riparian woodland communities provide important habitat for a wide variety of birds, including nesting trees for species that forage in a variety of habitats. Several species were documented breeding in this habitat during the surveys. These include common yellowthroat (*Geothlypis trichas*), blue grosbeak (*Guiraca caerulea*), California towhee (*Pipilo crissalis*), song sparrow (*Melospiza melodia*), house finch (*Carpodacus mexicanus*), and lesser gold finch (*Carduelis psaltria*). Other species suspected of breeding in this habitat on the project site include Anna's hummingbird, Bullock's oriole, and brown-headed cowbird (*Molothrus ater*), Cooper's, red-shouldered and red-tailed hawks, American kestrel, barn owl, and great horned owl. Other residents and summer residents that nest in the site's riparian areas include the black-chinned hummingbird, Nuttall's woodpecker, ash-throated flycatcher, common raven, house wren, blackheaded and blue grosbeaks, northern oriole, and lesser goldfinch. Migrant songbirds observed in the site's riparian woodlands include western wood-pewee, willow flycatcher,' Swainson's thrush, California yellow warbler, and western tanager. One wintering species, the Lincoln's sparrow, was observed in riparian habitat on the site. Most of the wintering species expected in other habitat types would also be expected to use riparian habitats on the site to a large extent.

Birds of Prey (raptors) that may breed on the project site and forage over the agricultural fields include barn owl (*Tyto alba*), great horned owl (*Bubo virginianus*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*). Other raptors expected to occur during the winter season include the Cooper's hawk (*Accipiter cooperii*), sharp-shinned hawk (*Accipiter striatus*), white-tailed kite (*Elanus leucurus*), and northern harrier (*Circus cyaneus*).

Birds are the most conspicuous animals in the study area, occurring commonly in all of the preserve's plant communities. A wide variety of species that are likely to nest on the site (year-round and summer residents) were noted during the surveys, along with numerous regular spring migrants. Due to the time of the surveys, relatively few winter

visitors were observed. Bird species observed and potentially present on the site are discussed below according to general habitat preferences.

- **Mammals**

Small mammals observed on the site include Beechey ground squirrel, Botta pocket gopher, Audubon cottontail, and several other rodents (California pocket mouse, Pacific kangaroo rat, western harvest mouse, California mouse, cactus mouse, deer mouse, San Diego desert woodrat, and dusky-footed woodrat). Additional expected species include the California vole and introduced house mouse.

Bats occur throughout most of Southern California and may use any portion of the project site as foraging habitat. Riparian vegetation provides potential roosting opportunities for several bat species. Most of the bats that could potentially occur on the project site are inactive during the winter months and either hibernate or migrate, depending on the species. Potential inhabitants in the site include the big brown bat (*Eptesicusfuscus*), Mexican free-tailed bat (*Tadarida brasiliensis*), California myotis (*Myotis californicus*), western pipistrelle (*Pipistrellus hesperus*), and hoary bat (*Lasiurus cinereus*) may all occur on the project site.

Medium-sized mammals expected to occur on the site include the Virginia opossum and striped skunk. Raccoon was detected by tracks along streambeds and near Sand Canyon Reservoir. Coyotes, bobcats, and mule deer were observed on multiple occasions. Mountain lions have been reported in the project vicinity, and potentially occur on the site. Larger mammals expected on the project site include the gray fox (*Urocyon cinereoargenteus*), striped skunk (*Mephitis mephitis*), and raccoon (*Procyon lotor*).

- **Butterfiles**

During the field surveys, twenty-three relatively common species of butterfly were found at the Shady Canyon project site. These included anise and western tiger swallowtails, sara orange-tip, striated queen, California ringlet, west coast lady, mourning cloak, buckeye, Behr's metalmark, California green hairstreak, and Bernardino blue. Many additional (non-sensitive) species would be expected to occur on the site.

Wildlife Movement/Habitat Connectivity

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by rugged terrain, changes in vegetation, or human disturbance. The fragmentation of open space areas by urbanization creates isolated "islands" of wildlife habitat. In the absence of habitat linkages that allow movement to adjoining open space areas, various studies have concluded that some wildlife species, especially the larger and more mobile mammals, will not likely persist over time in fragmented or isolated habitat areas because they prohibit the infusion of new individuals and genetic information

(MacArthur and Wilson 1967; Soule 1987; Harris and Gallagher 1989; Bennett 1990). Corridors mitigate the effects of this fragmentation by:

(1) allowing animals to move between remaining habitats, which allows depleted populations to be replenished and promotes genetic exchange;
(2) providing escape routes from fire, predators, and human disturbances, thus reducing the risk that catastrophic events (such as fire or disease) will result in population or local species extinction; and
(3) serving as travel routes for individual animals as they move within their home ranges in search of food, water, mates, and other needs (Moss 1983; Farhig and Merriam 1985; Simberloff and Cox 1987; Harris and Gallagher 1989).

Wildlife movement activities usually fall into one of three categories: (1) dispersal; (2) seasonal migration; (3) movements related to home range activities. A number of terms have been used in various wildlife movement studies, such as "wildlife corridor," "travel route," "habitat linkage," and "wildlife crossing" to refer to an area in which wildlife move from one area to another. The following terms are therefore defined below:

- Travel route - a landscape feature (such as a ridgeline, drainage, canyon, or riparian strip) within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g. water, food, cover, den sites). The travel route is generally preferred because it provides the least amount of topographic resistance in moving from one area to another; it contains adequate food, water, and/or cover while moving between habitat areas, and provides a relatively direct link between target habitat areas.
- Wildlife corridor - a piece of habitat, usually linear in nature that connects two or more habitat patches that would otherwise be fragmented or isolated from one another. Wildlife corridors are usually bounded by urban land areas or other areas unsuitable for wildlife. The corridor generally contains suitable cover, food, and/or water to support species and facilitate movement while in the corridor. Larger landscape-level corridors (often referred to as a "habitat or landscape linkages") can provide both transitory and resident habitat for a variety of species.

- Wildlife crossing - a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement. Crossings typically are manmade and include culverts, underpasses, drainage pipes, and tunnels to provide access across or under roads, highways, pipelines, or other physical obstacles. These often represent "choke points" along a movement corridor.

Within large areas of open space, in which there are few or no manmade or naturally occurring physical constraints to wildlife movement, natural wildlife corridors may not exist. Given an open space area that is both large enough to maintain viable populations of species and provide a variety of travel routes, wildlife will use "local" routes while searching for food, water, shelter, and mates and will not need to cross over into larger open space areas.

Based on size, location, vegetative composition, and availability of food, some of the wildlife movement areas (e.g. large drainages and canyons) are used for longer lengths of time and serve as source areas for food, water, and cover, particularly for small and medium-sized animals. This is especially true if the travel route is within a larger open space area.

Open space areas may become constrained and/or fragmented as a result of urban development or construction of physical obstacles such as roads and highways. The remaining landscape features or travel routes that connect the larger open space areas can "become" corridors as long as they provide adequate space, cover, food, and water, and do not contain obstacles or distractions (man-made noise, lighting) that would hinder wildlife movement.

Wildlife movement corridors are another aspect of wildlife habitation. Wildlife corridors can serve as a useful habitat in their own right or can serve as conduits for seasonal or daily movement of wildlife. These corridors are important for the free movement of animals between populations, for access to food and water sources during drought, as escape routes from brush fires, and eventually for dispersal of genetic traits between populations. The value of these corridors depends upon their width, habitat type and structure, nature of surrounding habitat, human use patterns, and other factors.

Slopes surrounding the Sand Canyon Reservoir have been identified by NCCP planners as an important component of the Coastal Subarea Habitat Reserve area because they support a major concentration of coastal California gnatcatchers and coastal cactus wrens. The habitat on these slopes serves as a refugium for displaced California gnatcatchers from the 1993 Laguna Beach fires. For these reasons, Shady Canyon is considered an important element of the subarea habitat reserve design, thereby requiring habitat linkages around and/or through the project site (for early reference to the project features which accommodate this refugium see Exhibit 5.3-8).

Special Status Biological Resources

The following section addresses special status biological resources observed, reported, or having the potential to occur within the preserve. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as private conservation organizations. In general, the principle reason an individual taxon (species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size or geographical extent and/or distribution resulting in most cases from habitat loss.

- **Definition of Special Status Biological Resources**

Special status habitats are vegetation types, associations, or subassociations that support concentrations of special status plant or wildlife species that are of relatively limited distribution, or are of particular value to wildlife (CDFG 1998). Although special status

habitats are not afforded legal protection unless they support protected species, potential impacts on them may increase concerns and mitigation suggestions by resources agencies.

A **federally Endangered species** is one facing extinction throughout all or a significant portion of its geographic range. A **federally Threatened species** is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range. The presence of any federally Threatened or Endangered species on a project site generally imposes severe constraints on development, particularly if development would result in "take" of the species or its habitat. The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm in this sense can include any disturbance to habitats used by the species during any portion of its life history.

Proposed species are those officially proposed by the United States Fish and Wildlife Services (USFWS) for addition to the federal Threatened and Endangered species list. Because proposed species may soon be listed as Threatened or Endangered, these species could become listed prior to or during implementation of a proposed development project.

Federal Species of Concern are species with an informal designation by the USFWS for some declining species that are not federal candidates for listing at this time. This designation does not provide legal protection but signifies that these species are recognized as special status by the USFWS.

The State of California considers an **Endangered species** as one whose prospects of survival and reproduction are in immediate jeopardy, a **Threatened species** is one present in such small numbers throughout its range that it is likely to become an Endangered species in the near future in the absence of special protection or management, and a **Rare species** as one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. Rare species applies to California native plants. State Threatened and Endangered species are fully protected against take.

California Species of Special Concern is an informal designation used by the California Department of Fish and Game (CDFG) for some declining wildlife species that are not state candidates. This designation does not provide legal protection but signifies that these species are recognized as special status by the CDFG.

Species that are **California Fully Protected** include those protected by special legislation for various reasons, such as the mountain lion and white-tailed kite.

The California Native Plant Society (**CNPS)** is a local resource conservation organization that has developed an inventory of California's special status plant species (CNPS 1999). This inventory is the summary of information on the distribution, rarity, and endangerment of California's vascular plants. This rare plant inventory is comprised of

four lists. CNPS presumes that **List lA** plant species are extinct in California because they have not been seen in the wild for many years. CNPS considers **List 1B** plants as Rare, Threatened, or Endangered throughout their range. List 2 plant species are considered Rare, Threatened, or Endangered in California but more common in other states. Plant species for which CNPS needs additional information are included on **List 3**. **List 4** plant species are those of limited distribution in California whose susceptibility to threat appears low at this time.

Special Status Vegetation Types: The CNDDB provides an inventory of vegetation types that are considered special status by the state and federal resource agencies, academic institutions, and various conservation groups. Determination of the level of sensitivity is based on the Nature Conservancy Heritage Program Status Ranks that rank both species and plant communities on a global and statewide basis according to the number and size of remaining occurrences as well as recognized threats (e.g. proposed developments, habitat degradation, and invasion by nonnative species). Special status plant communities on the project site are described in more detail below.

- **Riparian Vegetation**

The riparian vegetation on the site, including southern willow scrub and mule fat scrub, occurs along drainages that are typically subject to seasonal flooding. In the coastal floodplain of Southern California 95 to 97 percent of riparian habitat has been lost due to channelization for flood control and sand and gravel mining (Faber et al. 1989). The U.S. Army Corps of Engineers (ACOE) and CDFG may take jurisdiction over these at easements. Due to the reduction of riparian habitat throughout Southern California, this area is considered a special status vegetation type.

- **Coastal Sage Scrub**

Coastal sage scrub is located throughout the undeveloped portions of the foothills of Southern California. This vegetation type occurs on the project site in the form of mixed sage scrub, bush mallow sage scrub, bush mallow sage scrub/southern mixed chaparral, black sage scrub, black sage scrub/southern mixed chaparral, southern cactus scrub, coyote bush scrub/southern mixed chaparral, coyote bush scrub/southern mixed chaparral-annual grassland, and mixed sage scrub grassland.

Coastal sage scrub is considered a special status vegetation type because of its high potential to support Threatened and Endangered wildlife species. Two of the three "target species" of the NCCP program (coastal California gnatcatcher and coastal cactus wren) are known to occur in upland scrub (coastal sage scrub) on the project site and the orange-throated whiptail is expected to occur.

- **Native Grassland**

In its pristine condition in Southern California, native grassland was dominated by purple needlegrass and a perennial bunchgrass, as well as wild rye and alkali grasslands. Historically (pre-European settlement), valley needlegrass grassland covered as much as 17 percent of California (Keeley 1989) but has been greatly reduced by the invasion of non-native annual grasses and forbs of Mediterranean origin, changes in the kinds of animals and their grazing patterns, cultivation, and fire (Heady 1977). Only 0.1 percent of historic perennial native grasslands in California is extant (Barry 1981). Due to its reduction in range native grasslands are considered a special status vegetation type. The site's native and non-native grasslands provide habitat for at least one plant of local interest, mesa brodiaea, as well as several sensitive bird species, including the white-tailed kite and California horned lark.

- **Scrub Grasslands**

Scrub-grassland ecotones contain elements of two sensitive communities: upland scrub and native grassland. These ecotonal areas provide habitat values intermediate between scrub and grassland communities, and constitute potentially suitable habitat for a variety of sensitive species associated with grasslands and upland scrub habitats, including the California gnatcatcher and orange-throated whiptail, two of the three "target species" of the NCCP program.

- **Streambeds**

The site contains seasonal streambed areas with defined beds and banks, and small areas that may meet the criteria of jurisdictional wetlands. These drainage areas support native plant communities and are considered sensitive resources by state and federal resource agencies. Several sensitive animal species occur, or potentially occur, along the site's drainage courses, including western spadefoot toads and Cooper's hawk. Cactus wrens and California gnatcatchers use streambeds on the site that contain upland scrub, with gnatcatchers also occurring in some of the site's mulefat scrub and willow scrub communities.

Both state and federal policies emphasize avoidance of streambeds to the maximum practicable extent. As an initial step toward obtaining the required permits and agreement, a jurisdictional delineation acceptable to the U.S. Army Corps of Engineers (ACOE) and CDFG is required to determine the acreage of any affected jurisdictional areas.

- **Oak Resources**

Oak trees are biologically productive and of limited distribution in Orange County and statewide. As a result, the County of Orange General Plan Resource Element considers

oak resources to be of particular biological value, requires specific information to be gathered on any oak trees that may be impacted, and requires mitigation for habitat removal. State and federal resource agencies also consider oaks to be sensitive resources, and may regulate losses of trees along drainage courses under the California Fish and Game Code Section and U.S. Clean Water Act Section 404, respectively.

- **Special Status Plants**

The following special status plant species may occur in the preserves.

Coulter's saltbush (Atriplex coulteri)

The Coulter's saltbush is a CNPS List 1B species. It is a perennial subshrub, generally associated with alkaline soils in grassland and coastal bluff habitats. This species is known from Santa Barbara to San Diego counties and has been found in Laguna Beach, Pelican Hill, Signal Hill, Trabuco Canyon, and Cristianitos Canyon in Orange County. This species was not observed during spring surveys and is not expected to occur in the impact area of the project site due to lack of suitable habitat. There is potential habitat for this species in the open space area.

Thread-Leaved Brodiaea (Brodiaea filifolia)

The thread-leaved brodiaea is a federally listed Threatened species, a state Endangered species, and a CNPS List 1 B species. The thread-leaved brodiaea is a perennial herb that typically blooms from March through June. The brodiaea typically occurs on clay-silt soils or vernal pools and is known to occur in San Diego, Riverside, Los Angeles, San Bernardino, and Orange counties. Many of these populations are currently threatened by proposed development projects, although several large populations are found in reserves or managed open space sites, including the Santa Rosa Plateau. This species is known to occur in Aliso Canyon, Casper's Regional Park, the Rancho Mission Viejo Land Conservancy, and Forster Ranch in Orange County. This species was not observed during the spring survey; however, it may be present.

Catalina Mariposa Lily (Calochortus catalinae)

The Catalina mariposa lily is listed as a CNPS List 4 species that typically blooms from February through May. This bulbiferous perennial herb occurs in native grasslands and opening in coastal sage scrub from sea level to 2,100 feet above mean sea level (msl). This species occurs in coastal counties from Santa Barbara south to San Diego. This species is known in several locations throughout Orange County. Potentially suitable habitat is present.

Intermediate Mariposa Lily (Calochortus weedii var. intermedius)

The intermediate mariposa lily is a federal Species of Concern and a CNPS List IB species that typically blooms from May to June. The lily is a bulbous perennial herb found from sea level to 2,000 feet above msl in chaparral, coastal sage scrub, valley and foothill grassland communities, as well as rocky outcrops. This species is known in Los Angeles, Riverside, and Orange counties and threatened by development, road construction, and fuel modification (CNPS 1999). This species is known to occur in Aliso Viejo, Laguna Beach, San Joaquin Hills, Trabuco Canyon and Gypsum Canyon in Orange County. The mariposa lily does have the potential to occur in the open space area.

Small flowered morning glory (Convolvulus simulans)

The small flowered morning glory is a CNPS List 4 species that blooms between March and June. This species is an annual herb that is found from about 90 to 2,100 feet above msl in coastal sage scrub and grassland communities with clay or serpentine soils. It is known to occur throughout southern California and has been recently located in Cristianitos and Aliso Canyons in Orange County. The morning glory does have the potential to occur in the open space area.

Many-Stemmed Dudleya (Dudleya multicaulis)

The many-stemmed dudleya is a federal Species of Concern and a CNPS List 1B species that typically blooms from May to July. The many-stemmed dudleya is a perennial herb with an underground stem found from sea level to 1,800 feet above msl in chaparral, coastal sage scrub, valley and foothill grassland communities, often with clay soils. This species is known in Los Angeles, Riverside, San Diego, San Bernardino and Orange counties. The largest populations occur in Orange County, including locations at Pelican Hill, Turtle Rock, Sycamore Hills, Gypsum Canyon, and Starr Ranch. The many-stemmed dudleya has been recorded in Bommer Canyon.

Palmer's Grapplinghook (Harpagonella palmeri)

The Palmer's grapplinghook is a CNPS List 2 species that blooms between March and April. This small, inconspicuous annual grows on dry slopes and mesas in grassland, sage scrub, and chaparral habitats below 1,500 feet above msl. This species historically occurred from Los Angeles County to Baja California and on the Channel Islands. In Orange County, this species is present at Dana Point Headlands, Casper's Regional Park, and Gabino Canyon in Rancho Mission Viejo. Potentially suitable habitat is present. Palmer's grapplinghook does have the potential to occur in the open space area.

Small-Flowered Microseris (Microseris douglasii var. playcarphya)

The small-flowered microseris is a CNPS List 4 species that typically blooms March through May. This species is an annual herb that grows in valley and foothill grasslands, cismontane woodland, coastal scrub, and vernal pools. This species is known from Los

Angeles County south to San Diego County and into Baja California. The microseris is threatened by urbanization. Small-flowered microseris does have the potential to occur in the open space area.

Matilija Poppy (Romneya coulteri)

The matilija poppy is a CNPS List 4 species that typically blooms March through July. It is a rhizomatous perennial herbaceous shrub that often forms dense clonal clumps on coastal sage scrub and chaparral. The poppy is known to occur in Los Angeles, Riverside, Orange, and San Diego counties. This species occurs in scattered localities throughout Orange County and is threatened by urbanization, road widening, and flood control. Matilija poppy does have a limited potential to occur in the open space area.

Salt Spring checkerbloom (Sidalcea neomexicana)

The Salt Spring checkerbloom is a CNPS List 2 species that typically blooms March through July. This perennial herb occurs in chaparral coastal scrub, lower montane coniferous forest, Mohavean desert scrub, and playas on alkaline soil. The checkerbloom is known to occur throughout Southern California and in several other states. This species is known to occur east of Canada Chiquita and north of Highway 74 in Orange County. This is the only known location in Orange County. This species does have a limited potential to occur in the open space area.

Special Status Wildlife

A total of 44 special status wildlife species are known to occur within the region and have a potential to occur within the preserve. A brief description of these special status wildlife species and their potential to occur on the project site are discussed below.

- **Amphibians**

Western Spadefoot Toad (Scaphiopus ammondii)

The western spadefoot toad is a federal Species of Concern, a California Species of Special Concern, and is a CDFG protected species. The species inhabits grassland, coastal sage scrub, and other habitats with open sandy gravel soils. The western spadefoot toad is primarily a species of the lowlands, frequenting washes, floodplains of rivers, alluvial fans, and alkali flats (Stebbins 1985). This species is rarely seen outside of the breeding season. They breed in vernal pools and temporary ponds. The open space area does provide a limited amount of suitable habitat for this species and its potential for occurrence is considered to be low.

- **Reptiles**

Silvery Legless Lizard (Anniella pulchra pulchra)

The silvery legless lizard is a federal Species of Concern and a California Species of Special Concern. It is a small and secretive lizard that spends most of its life beneath the soil, under stones, logs, debris, or within leaf litter. The silvery legless lizard inhabits areas with moist sandy soil, including dry washes, woodlands, riparian, and scrub habitats. It ranges in elevation from sea level to about 5,000 feet above msl (Stebbins 1985). The impact area and the open space area provides suitable habitat for this species and its potential for occurrence is considered to be moderate.

Belding's Orange-throated Whiptail (Cnemidophorus hyperythrus beldingc)

The orange-throated whiptail is a federal Species of Concern, a California Species of Special Concern, and is a CDFG protected species. This species inhabits open areas of coastal sage scrub with gravelly soils often with rocks, below 2,800 feet in elevation in San Bernardino, Orange, Riverside, and San Diego counties. The orange-throated whiptail prefers well-drained friable soil of slopes that have a southern exposure and are barren or only sparsely covered with vegetation. The open space area provides suitable habitat for this species and its potential for occurrence is considered to be high.

Coastal Western Whiptail (Cnemidophorus tigris multiscutatus)

The Coastal western whiptail is a federal Species of Concern. It is moderately large, slender lizard typically found in semi-arid areas or where vegetation is sparse. The coastal western whiptail inhabits open scrub, chaparral, and woodland habitats. This subspecies is restricted to the western coast of North America from Ventura county, California, south through the northern two-thirds of the Baja California peninsula. The open space area provides suitable habitat for this species and its potential for occurrence is considered to be high.

San Diego Banded Gecko (Coleonyx variegatus abbotti)

The San Diego banded gecko is a federal Species of Concern and is considered locally rare in southwestern California. It is a small, nocturnal lizard with soft skin and granular scales. The San Diego banded gecko ranges along the coast of Southern California from Los Angeles County south to mid-Baja California (Dixon 1970), and from sea level to approximately 5,000 feet above msl (Stebbins 1985). The San Diego banded gecko prefers rocky outcrops within coastal sage scrub and chaparral habitats (Zeiner et al. 1988). The open space area provides a limited amount of suitable habitat for this species and its potential for occurrence is considered to be low.

San Diego Coast Horned Lizard (Phrynosoma coronatum blainvillet)

The San Diego coast horned lizard is a federal Species of Concern, a California Species of Special Concern, and is a CDFG protected species. It is a small, spongy, somewhat rounded lizard that occurs primarily in open or sparse scrub and chaparral habitats. This species prefers loose friable soil for burrowing. The loss of habitat, overcollecting and the introduction of ants displacing the native species upon which the lizard feeds have all

contributed to this lizards decline (Hix 1990). The open space area provides suitable habitat for this species and its potential for occurrence is considered to be high.

Northern Red-Diamond Rattlesnake (Crotalus ruber ruber)

The Northern red-diamond rattlesnake is a federal Species of Concern and a California Species of Special Concern. It inhabits coastal sage scrub, chaparral, and grassland habitats that provide cover in the form of rocky outcrops or dense vegetation. The species ranges from southern San Bernardino County, south into Baja California, and from sea level to about 5,000 feet above msl (Stebbins 1985). It is active from mid-spring to mid-fall (Zeiner et al. 1988). The open space area provides suitable habitat for this species and its potential for occurrence is considered to be high.

San Bernardino Ringneck Snake (Diadophis punctatus modestus)

The San Bernardino ringneck snake is a federal Species of Concern, and is considered locally rare in southwestern California. Although this species is found in a variety of habitats including coastal sage scrub and chaparral, it is most common in open, relatively rocky habitats. This species is difficult to detect due to its secretive behavior. It occurs in elevations from sea level to 7,000 feet above msl (Stebbins 1985). The open space area provides suitable habitat for this species and its potential for occurrence is considered to be high.

Western Blind Snake (Leptotyphlops humilis)

The western blind snake is a federal Species of Concern, and is considered locally rare in southwestern California. This is a small, slender snake that spends most of its time underground. Although this species can be found in a variety of habitats, it requires friable soils suitable for burrowing (Zeiner et al. 1988). It prefers rocky hillsides with patches of loose soils and canyon bottoms or washes in the vicinity of permanent or intermittent streams and is found at elevations from sea level to 5,000 feet above msl (Stebbins 1985). The open space area provides a limited amount of suitable habitat for this species and its potential for occurrence is considered to be low.

Coast Patch-Nosed Snake (Salvadora hexalepis virgultea)

The coast patch-nosed snake is a federal Species of Concern and a California Species of Special Concern. This snake is active during the daytime, spending its time on the ground, with the capability of moving as fast as racers or whipsnakes. This species is found in scrub, chaparral, and grassland habitats in both sandy and rocky areas (Stebbins 1985). The coast patch-nosed snake ranges along the coast of California from San Luis Obispo County south into Baja California and occurs from sea level to about 7,000 feet above msl (Stebbins 1985). The open space area provides suitable habitat for this species and its potential for occurrence is considered to be moderate.

- **Birds**

White-Tailed Kite (Elanus leucurus)

The White-tailed kite is a California Fully Protected species. This mostly white raptor hovers over fields in search of prey. North American populations of this species, including Orange County (Hamilton and Willick 1996), have declined during the 1980s and 1990s. Reasons for this decline have been attributed to loss of habitat and increased disturbance (Dunk 1995). Breeding habitat for this species consists of savannah like habitats such as grasslands or other open space areas with nearby trees for nesting. This raptor shows strong site fidelity to trees (grove or isolated) that are used for nesting or roosting. The site provides suitable foraging habitat and habitat for this species. As a result, the potential for occurrence of the white-tailed kite in the open space area is considered to be high for foraging, but low for nesting.

Northern Harrier (Circus cyaneus)

The northern harrier is a California Species of Special Concern. It is a regular winter migrant and also occasionally breeds in Orange County. It can be expected at any month of the year and can be seen foraging in grassland, scrub, and riparian habitats. While once a relatively common species during fall, winter, and spring in undeveloped areas of Orange County, the northern harrier population is now greatly reduced and localized in distribution. The project site provides suitable foraging habitat and nesting habitat for this species. As a result, the potential for occurrence of the northern harrier is considered to be high.

Sharp-Shinned Hawk (Accipiter striatus)

The Sharp-shinned hawk is a California Species of Special Concern. It is a relatively common raptor throughout the region during the winter season. This species prefers woodland habitats but can also be found in virtually any habitat as it passes through the area during migration. Oak and riparian areas are preferred habitats of this species. This raptor nests in mountainous regions to the north, rarely remaining in Southern California during the summer season. The project site provides suitable foraging habitat, and some nesting habitat for this species. As a result, the potential for occurrence of the sharp-shinned is considered to be high.

Cooper's Hawk (Accipiter cooperii)

The Cooper's hawk is a California Species of Special Concern. Both resident and migratory populations of this species exist in Orange County. Wintering Cooper's hawks are often seen in wooded urban areas and native woodland habitats. Preferred nesting habitats are oak and riparian woodlands dominated by sycamores and willows. Cooper's hawk in the region prey on small birds and rodents that live in woodland and occasionally

scrub and chaparral habitats. The project site provides suitable habitat. The Cooper's hawk was observed during the surveys.

Swainson's Hawk (Buteo swainsoni)

The Swainson's hawk is a state Threatened species. This raptor was formerly more common with nesting records for the neighboring counties to Orange County (Hamilton and Willick 1996), but has since been extirpated as a breeding species from the coastal region of southern California. The Swainson's hawk is now a rare migrant along the coastal slope of southern California (Garrett and Dunn 1981). Less than two a year on average are now recorded in Orange County (Hamilton and Willick 1996). As a result, the potential for occurrence of the Swainson's hawk is considered to be very low and as a migrant only.

Ferruginous Hawk (Buteo regalis)

The Ferruginous hawk is a federal Species of Concern and a California Species of Special Concern. This raptor is only a winter visitor to Southern California (Garrett and Dunn 1981). Formerly fairly common in Orange County during the winter season, the ferruginous hawk is now rare with only about ten birds per year (Hamilton and Willick 1996). Open habitats such as grasslands and agricultural fields are required for foraging. The project site provides suitable habitat. The potential for occurrence of the ferruginous hawk is considered to be low.

Golden Eagle (Aquila chrysaetos)

The Golden eagle is a California Fully Protected species, a California Species of Special Concern, and is also protected by the federal Bald Eagle Act. The golden eagle is an uncommon resident throughout most of Southern California (Garrett and Dunn 1981). This large raptor can forage over most habitats, but avoids heavily forested mountain habitats and is generally absent from the urban areas. It typically nests in the more remote, rugged, mountainous areas. The project site provides suitable habitat. As a result, the potential for occurrence of the golden eagle is considered to be low.

Merlin (Falco columbarius)

The merlin is a California Species of Special Concern. In California, this falcon prefers vast open space areas such as estuaries, grasslands, and deserts where it hunts small flocking birds such as sandpipers, larks, sparrows, and pipits. The merlin is an uncommon migrant and winter visitor of Orange County (Hamilton and Willick 1996). The raptor nests north of California. The project site provides suitable habitat. As a result, the potential for occurrence of the merlin is considered to be moderate.

Peregrine Falcon (Falco peregrines)

The peregrine falcon is a state- and federally-listed Endangered species that, due to recent population gains, has been recently proposed for delisting by the USFWS. No such delisting has been proposed by the state. Peregrine falcons prey almost exclusively on birds and use a variety of habitats, particularly wetlands and coastal areas. This falcon is a rare summer resident in Southern California, although it is more common during migration and the winter season. For nesting, this falcon prefers inaccessible areas, such as, cliffs, high building ledges, bridges, or other such structures. The project site provides suitable foraging habitat for this species. As a result, the potential for occurrence of the peregrine falcon is considered to be low.

Prairie Falcon (Falco mexicanus)

The prairie falcon is a California Species of Special Concern. Because of winter and nesting habitat loss, few areas remain in Orange County where prairie falcons can be consistently observed, and no nest sites have been documented in the County in over 50 years. Preferred foraging habitat in Orange County includes grasslands, scrub habitats, and estuaries. The project site provides suitable habitat. As a result, the potential for occurrence of the prairie falcon is considered to be low.

Mountain Plover (Charadrius montanus)

The mountain plover is a federal Candidate for listing as Threatened or Endangered and a California Species of Special Concern. The mountain plover is an uncommon and local winter resident of plains and valleys of interior southern California. Wintering habitats include short-grass plains and agricultural areas with freshly plowed fields. Formerly small numbers of this plover wintered in and around the city of Irvine until the mid-1980s, and the last record of this species for this area was in the winter of 1986/87 at the El Toro Marine Base (Hamilton arid Willick 1996). Since that time there have been very few records of this species m Orange County, with most occurring at the Seal Beach Naval Weapons Station. Although the agricultural fields of the project site provide suitable foraging habitat for this species, the suburban development in the area has substantially reduced the potential for this species' occurrence. As a result, the potential for occurrence of the mountain plover is considered to be very low.

Burrowing Owl (Speotyto cunicularia)

The burrowing owl is a federal Species of Concern and a California Species of Special Concern. Breeding and foraging habitat of this owl consists of grasslands, preferably on flat to low rolling hills in treeless terrain. The burrowing owl was formerly more common in Orange County, but now the population has been reduced to one pair near the University of Irvine and five pairs on the Seal Beach Naval Weapons Station (Hamilton and Willick 1996). Although the agricultural fields of the project site provide suitable foraging habitat for this species, the suburban development in the area has substantially

reduced the potential for this species' occurrence. As a result, the potential for occurrence of the burrowing owl is considered to be very low.

Southwestern Willow Flycatcher (Empidonax traillu extimus)

The Southwestern willow flycatcher is a federal and California Endangered species. This subspecies was once considered a common breeder in coastal Southern California. However, this subspecies has declined drastically due to a loss of breeding habitat and nest parasitism by brown-headed cowbirds. This species occurs in riparian habitats along rivers, streams, or other wetlands where dense growths of willows, baccharis, arrowweed (Pluchea sp.), tamarisk (Tamarix sp.), or other plants are present, often with a scattered overstory of cottonwood (Populus sp.) (USFWS February 27, 1995). The potential for occurrence of the flycatcher in the open space area is considered low for nesting.

Loggerhead Shrike (Lanius ludovicianus)

The loggerhead shrike is a federal Species of Concern and a California Species of Special Concern. This species is a fairly common resident of lowlands and foothills in Southern California. Shrikes inhabit grasslands and other dry, open habitats. They can often be found perched on fences and posts from which prey items (large insects, small mammals, and lizards) can be seen. The preserve provides suitable foraging habitat and nesting habitat for this species. As a result, the potential for occurrence of the loggerhead shrike is considered to be moderate for foraging and low for nesting.

Least Bell's Vireo (Vireo belle pusillus)

The least Bell's vireo is a federal and state Endangered species. Now a rare and local summer resident of Southern California's lowland riparian woodlands, the least Bell's vireo was formerly more common and widespread. In 1980, the state designated the least Bell's vireo as an Endangered species; the federal government did the same in 1986. Surveys in 1987 indicated that there were only about 440 territorial males and 283 known breeding pairs in the United States (Franzreb 1989). While destruction of lowland riparian habitats has played a large role in driving this species to its present precarious situation, brood parasitism by brown-headed cowbirds must be cited as the single most important factor in its decline (Garrett and Dunn 1981). Since being federally listed in 1986, the least Bell's vireo population has begun to recover. Local cowbird control programs have been very effective in maintaining some populations (Small 1994). Based on information from the USFWS, approximately 1,500 territories were located in 1995 (Hays 1995). The potential for occurrence in the open space is considered to be low.

California Horned Lark (Eremophila alpestris actia)

The CDFG has included this subspecies on its list of California Species of Special Concern. The California horned lark is found along the coast of Northern California, in the San Joaquin Valley, in the Coast Ranges south of San Francisco Bay, and in Southern California west of the deserts. The California horned lark is a fairly common, but a local

breeding resident in grasslands, rangelands, and agricultural fields of Orange County (Hamilton and Willick 1996). The project site provides suitable foraging and nesting habitat for this species. The potential for occurrence in the open space is considered low for foraging and breeding.

Coastal Cactus Wren (Campylorhynchus brunneicapillus)

The coastal cactus wren is a California Species of Special Concern. It is an uncommon resident for southern Ventura County south to San Diego County and northwest Baja California. This wren requires sage scrub habitat with patches of prickly pear and/or cholla cactus. In Orange County, this species is considered a fairly common resident of coastal sage scrub habitat containing significant cactus patches in the coastal hills and foothills (Hamilton and Willick 1996). In 1997, focused surveys for this species were conducted for the Nature Reserve of Orange County in a large part of the designated open space on the project site. The coastal cactus wren was observed in the preserve area.

Coastal California Gnatcatcher (Polioptila californica californica)

The coastal California gnatcatcher is listed as federally Threatened and a California Species of Special Concern. This species occurs in most of Baja California's arid regions but is extremely localized in the United States, where it predominantly occurs only in coastal regions of the highly urbanized Southern California counties of Los Angeles. Orange, Riverside, and San Diego (Atwood 1992). In California, this species is an obligate resident of several distinct subassociations of the coastal sage scrub vegetation type. Brood parasitism by brown-headed cowbirds and loss of habitat to urban development have been cited as causes of the coastal California gnatcatcher population decline (Unitt 1984;Atwood 1990). The California population was estimated to be for the Nature Reserve of Orange County in a large part of the designated open space area. The California coastal gnatcatcher was also observed in the open space preserve.

Western Yellow Warbler (Dendroica petechia brewsteri)

The western yellow warbler is a California Species of Special Concern. The subspecies of yellow warbler that breeds in Southern California is D.p. brewsteri (Dunn and Garrett 1997). The CDFG has included this subspecies on its list of California Species of Special Concern. D.p. brewsteri occurs in coastal areas from northwestern Washington south to western Baja California (Dunn and Garrett 1997). In Southern California, the yellow warbler is a common migrant, but an uncommon breeder in riparian habitats (Garrett and Dunn 1981). The project site provides a limited amount of suitable nesting habitat for this species.

Yellow-Breasted Chat (Icteria virens)

The Yellow-breasted chat is a California Species of Special Concern. This large warbler was once a fairly common summer resident in riparian woodlands throughout California but is now much reduced in numbers, especially in Southern California (Remsen 1978).

For nesting, this species requires dense, brushy tangles near water and riparian woodland supporting a thick understory. The potential for occurrence of the yellow-breasted chat on the project site is considered to be high for a migrant, but low for nesting.

Southern California Rufous-Crowned Sparrow (Aimophila ruficeps canescens)

The Southern California rufous-crowned sparrow is a federal Species of Concern and a California Species of Special Concern. In coastal Southern California, rufous-crowned sparrows are considered fairly common in scrub habitats and other habitats vegetated with grasses and widely spaced low shrubs. They also prefer slopes with rocky outcrops. This subspecies is present throughout the year in Southern California. The open space area provides suitable habitat for this species and it was observed during the surveys.

Bell's Sage Sparrow (Amphispiza belli belk)

The Bell's sage sparrow is a federal Species of Concern and a. California Species of Special Concern. This coastal subspecies is an uncommon to fairly common local resident in the interior foothills of coastal Southern California. Bell's sage sparrow breeds in low, dense chamise chaparral and in dry scrub habitats, often with stands of cactus (Garrett and Dunn 1981). In Orange County this species is an uncommon and local resident that primarily occurs in chamise chaparral of the lower Santa Ana Mountains (Hamilton and Willick 1996). Although potentially suitable habitat is present for this sparrow, it is very rare in the San Joaquin Hills and its potential for occurrence is considered to be low.

Tricolored Blackbird (Agelaius tricolor)

The Tricolored blackbird is a federal Species of Concern and a California Species of Special Concern. These colonially nesting birds prefer to breed in marsh vegetation of bulrushes and cattails and have also been recorded nesting in willows, black berries, and mustard (Beedy et. AI 1991). During winter months, they are often found foraging in wet pastures, agricultural fields, and seasonal wetlands. Tricolored blackcirds are nomadic, wandering during the nonbreeding season and occupying colony site intermittently (Unitt 1984). The project site provides suitable habitat. As a result, the potential for occurrence of the tricolored blackbird is considered to be moderate.

- **Mammals**

Small-Footed Myotis (Myotis ciliolabrum)

The small-footed myotis is a federal Species of Concern that occurs throughout much of the western United States occupying a variety of habitats. This species feeds among trees or over brush, and roosts in cavities of cliffs, trees, or rocks and within caves or mine shafts. The project site provides potentially suitable habitat. As a result, the potential of occurrence of the small-footed myotis in the open space area is considered to be moderate.

Yuma Myotis (Myotis yumanensis)

The Yuma myotis is a federal Species of Concern and a relatively small bat that occurs statewide. This species is closely associated with water and wooded canyon bottoms throughout its range. Caves and old buildings are preferred roosting habitats, with roosts numbering up to 2,000 individuals. The site provides limited amount of potentially suitable foraging and roosting opportunities. As a result, the potential of occurrence of the Yuma myotis in the open space area is considered to be low.

Spotted Bat (Euderma maculatum)

The Spotted bat is a federal Species of Concern and a California Species of Special Concern. This species may be considered one of North America's rarest mammals (CDFG 1991). The spotted bat is known to occur in the foothills, mountains, and desert regions of Southern California within desert, grassland, and forest habitats where it roosts in cliffs. The project site provides limited amount of potentially suitable foraging and roosting opportunities. As a result, the potential of occurrence of the spotted bat in the open space area is considered to be very low.

Pale Townsend's Big-Eared Bat (Corynorhinus townsendu pallescens)

The Pale Townsend's big-eared bat is a federal Species of Concern and a California Species of Special Concern that occurs throughout California. In the southern portion of the state, the subspecies C. t. pallescens (Hall 1981) occupies a variety of habitats, including oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Known roosting sites in California include mines, caves, and buildings. The project site provides limited amount of potentially suitable foraging roosting opportunities. As a result, the potential of occurrence of the Pale Townsend's big-eared bat in the open space area is considered to be very low.

Pallid Bat (Antrozus pallidus)

The pallid bat is a California Species of Special Concern that most commonly occurs in mixed oak and grassland habitats. This large bat roosts in rock crevices and in cavities of trees, especially oaks. The project site provides potentially suitable foraging and roosting opportunities. As a result, the potential of occurrence of the pallid bat is considered to be moderate.

Pocketed Free-Tailed Bat (Nyctinomops fermorosaccus)

The Pocketed free-tailed bat is a California Species of Special Concern. This species is known to occur in areas with ponds, streams, or arid deserts that provide suitable foraging habitats for this species. The site provides potentially suitable foraging and roosting opportunities. As a result, the potential of occurrence of the pocketed free-tailed bat in the open space area is considered to be moderate.

Big Free-Tailed Bat (Nyctinomops fermorosaccus)

The big free-tailed bat is a California Species of Special Concern. This species feeds primarily on moths caught while flying over water sources in suitable habitat in the southwestern United States. The site provides potentially suitable foraging roosting opportunities. As a result, the potential of occurrence of the big free-tailed bat in the open space area is considered to be moderate.

California Mastiff Bat (Eumops perott calcfornicus)

The California mastiff bat, the largest bat in the United States, is a federal Species of Concern and a California Species of Special Concern. This species is a very wide-ranging and high-flying insectivore that typically forages in open areas with high cliffs. It roosts in crevices in small colonies. The site provides limited amount of potentially suitable foraging roosting opportunities. As a result, the potential of occurrence of the California mastiff bat in the open space area is considered to be low.

San Diego Black-Tailed Jackrabbit (Lepus californicus bennettit)

The San Diego subspecies of the widespread black-tailed jackrabbit is a federal Species of Concern and a California Species of Special Concern that is restricted to the Pacific slope from Santa Barbara County to northwestern Baja California. This nocturnal species prefers relatively open areas with sparse shrub cover. The site provides potentially suitable habitat for these species. As a result, the potential of occurrence of the San Diego black-tailed jackrabbit in the open space area is considered to be moderate.

San Diego Desert Woodrat (Neotoma lepida intermedia)

The San Diego desert woodrat is a federal Species of Concern and a California Species of Special Concern that occupies arid areas with sparse vegetation, especially those comprised of cactus and other thorny plants. This subspecies is restricted to the Pacific slope from San Luis Obispo County to northwestern Baja California. The site provides suitable habitat for this species. As a result, the potential of occurrence of the San Diego desert woodrat in the open space area is considered high.

Southern Grasshopper Mouse (Onychomys torridus ramona)

The southern grasshopper mouse is a federal Species of Concern and a California Species of Special Concern. This species is a territorial predatory rodent of grassland and sparse scrub habitats. It prefers sandy soils and range from Los Angeles County to northwestern Baja California. The historical range of this subspecies does not include coastal habitats (Jameson and Peeters 1988); therefore, the project site may be outside of the range of this species. Although suitable habitat for this species is present in the impact area and open space area on the project site, the potential for its occurrence is considered to be low.

WILDLIFE SPECIES WITHIN THE PRESERVE

The following is a list of probable wildlife within the preserve. This list is derived from various surveys which recorded species in terms of relative abundance.

SPECIES
Batrachoseps major Garden slender salamander
Bufo boreas Western toad
Scaphiopus hammondi Western spadefoot
Pseudacris regilla Pacific Chorus frog
IGUANIDAE – IGUANID LIZARDS
Phrynosoma coronatum blainvillei Coast horned lizard
Sceloporus occidentalis Western fence lizard
Uta stansburiana Side-blotched lizard
SCINCIDAE – SKINKS
Eumeces skiltonianus Western skink
TEIIDAE – WHIPTAIL LIZARDS
Cnemidophorus hyperythrus Orange-throated whiptail
Cnemidophorus tigris multiscutatus Coastal western whiptail
Gerrhonotus multicarinatus Southern alligator lizard
Diadophis punctatus Ringneck snake
Lampropeltis getulus Common kingsnake
Masticophis flagellum Coachwhip
Masticophis lateralis California whipsnake
Pituophis melanoleucus Gopher snake
Crotalus rubber Red diamond rattlesnake
Crotalus viridis Western rattlesnake

SPECIES
Phalacrocorax auritus Double-crested cormorant
Ardea herodias Great blue heron
Ardea albus Great egret
Egretta thula Snowy egret
Bubulcus ibis Cattle egret
Butorides virescens Green heron
Nycticorax nycticorax Black-crowned night-heron
Anas platyrhynchos Mallard
Cathartes aura Turkey vulture
Elanus leucurus White-tailed kite
Circus cyaneus Northern harrier
Accipiter striatus Sharp-shinned hawk
Accipiter cooperii Cooper's hawk
Buteo lineatus Red-shouldered hawk
Buteo jamaicensis Red-tailed hawk
Buteo regalis Ferruginous hawk
Aquila chrysaetos Golden eagle
Falco sparverius American Kestrel
Falco columbarius Merlin
Falco mexicanus Prairie falcon
Falco peregrinus Peregrine falcon
Callipepla californica California quail

SPECIES
Charadrius vociferous Killdeer
Gallinago gallinago Common snipe
Larus delawarensis Ring-billed gull
Sterna elegans Elegant Tern
Sterna forsteri Forster's Tern
Columba livia Rock dove
Zenaida macroura Mourning dove
Columbina passerina Common ground-dove
Geococcyx californianus Greater roadrunner
Tyto alba Barn owl
Bubo virginianus Great horned owl
Athene cunicularia Burrowing owl
Chordeiles acutipennis Lesser nighthawk
Phalaenoptilus nuttallii Common poorwill
Chaetura vauxi Vaux's swift
Aeronautes saxatalis White-throated swift
Archilochus alexandri Black-chinned hummingbird
Calypte anna Anna's hummingbird
Calypte Costae Costa's hummingbird
Selasphorus rufus Rufous hummingbird
Selasphorus sasin Allen's hummingbird
Picoides nuttalii Nuttall's woodpecker

SPECIES
Picoides pubescens Downy woodpecker
Colaptes auratus Northern flicker
Contopus borealis Olive-sided flycatcher
Contopus sordidulus Western wood pewee
Empidonax traillii Willow flycatcher
Emidonax hammondii Hammond's flycatcher
Empidonax oberholseri Dusky flycatcher
Empidonax difficilis Pacific-slope flycatcher
Sayomis nigricans Black phoebe
Sayomis saya Say's phoebe
Myiarchus cinerascens Ash-thoated flycatcher
Tyrannus vociferans Cassin's kingbird
Tyrannus verticalis Western kingbird
Lanius ludovicianus Loggerhead shrike
Vireo bellii Bell's vireo
Vireo cassinii Cassin's vireo
Vireo huttoni Hutton's vireo
Vireo gilvus Warbling vireo
Aphelocoma California Western scrub-jay
Corvus brachyrhynchos American crow
Corvus corax Common raven
Eremophila alpestris Horned lark

SPECIES
Tachycineta bicolor Tree swallow
Tachycineta thalassina Violet-green swallow
Stelgidopterx serripennis Northern rough-winged swallow
Hirundo pyrrhonota Cliff swallow
Hirundo rustica Barn swallow
Psaltriparus minimum Bushtit
Campylorhynchus brunneicapillus Cactus wren
Salpinctes obsoletus Bewick's wren
Thryomanes bewickii Bewick's wren
Troglodytes aedon House wren
Cistothorus palustris Marsh wren
Regulus calendula Ruby-crowned kinglet
Polioptila caerulea Blue-gray gnatcatcher
Polioptila clifornica California gnatcatcher
Sialia currucoides Mountain bluebird
Catharus ustulatus Swainson's thrush
Catharus guttatus Hermit thrush
Turdus migratorius American robin
Chamaea fasciata Wrentit
Mimus polyglottos Northern mockingbird
Oreoscoptes montanus Sage thrasher
Toxostoma redivivum California thrasher

SPECIES
Sturnus vulgaris European starling
Anthus rubescens American pipit
Bombycilla cedrorum Cedar waxwing
Phainopepla nitens Phainopepla
Vermivora celata Orange-crowned warbler
Vermivora ruficapilla Nashville warbler
Dendroica petechia Yellow warbler
Dendroica coronata Yellow-rumped warbler
Dendroica nigrescens Black-throated gray warbler
Dendroica townsendi Townsend's warbler
Dendroica occidentalis Hermit warbler
Oporonis tolmiei MacGillivrav's warbler
Geothylpis trichas Common yellowthroat
Wilsonia pusilla Wilson's warbler
Icteria virens Yellow-breasted chat
Piranga Iudoviciana Western tanager
Pipilo maculates Spotted towhee
Pipilo crissalis California towhee
Aimophila ruficeps Rufous-crowned sparrow
Spizella passerina Chipping sparrow
Pooecetes gramineus Vesper sparrow
Chondestes grammacus Lark sparrow

SPECIES
Passerculus sandwichensis Savannah sparrow
Ammodramus savannarum Grasshopper sparrow
Passerella iliaca Fox sparrow
Melospiza melodia Song sparrow
Melospiza lincolnii Lincoln's sparrow
Zonotrichia atricapilla Golden-crowned sparrow
Zonotrichia leucophrys White-crowned sparrow
Junco hyemalis Dark-eyed junco
Pheuticus melanocephalus Black-headed grosbeak
Guiraca caerulea Blue grosbeak
Passerina amoena Lazuli bunting
Agelaius phoeniceus Red-winged blackbird
Agelaius tricolor Tricolored blackbird
Sturnella neglecta Western meadowlark
Euphagus cyanocephalus Brewer's blackbird
Molothrus ater Brown-headed cowbird
Icterus cucullatus Hooded oriole
Icterus bullockii Bullock's oriole
Carpodacus mexicanus House finch
Carduelis psaltria Lesser goldfinch
Carduelis lawrencei Lawrence's goldfinch
Carduelis tristis American goldfinch

SPECIES
Passer domesticus House sparrow
Didelphis virginiana Virginia opossum
Scapanus latimanus Broad-footed mole
Antrozous pallidus Pallid bat
Eptesicus fuscus Big brown bat
Euderma maculatum Spotted bat
Lasionycteris noctivagans Silver-haired bat
Lasiurus blossevillii Western red bat
Lasiurus cinereus Hoary bat
Lasiurus xanthinus Western yellow bat
Myotis californicus California myotis
Myotis leibii Small-footed myotis
Myotis lucifugus Little brown myotis
Myotis yumanensis Yuma myotis
Pipistrellus Hesperus Western pipistrelle
Plecotus townsendii Townsend's big-eared bat
Eumops perotis californicus California mastiff bat
Nyctinomops femorosaccus Pocketed free-tailed bat
Nyctinomops macrotis Big free-tailed bat
Tadarida brasiliensis Mexican free-tailed bat
LEPORIDAE – HARES & RABBITS
Sylvilagus audubonii Desert cottontail
Lepus californicus Black-tailed jackrabbit

SPECIES
Spermophilus beecheyi California ground squirrel
Thomomys bottae Botta's pocket gopher
Chaetodipus californicus California pocket mouse
Microtus californicus California vole
Mus musculus House mouse
Neotoma fuscipes Dusky-footed woodrat
Neotoma lepida Desert woodrat
Peromyscus californicus California mouse
Peromyscus eremicus Cacus mouse
Peromyscus maniculatus Deer mouse
Reithrodontomys megalotis Western harvest mouse
Canis latrans Coyote
Urocyon cinereoargenteus Gray fox
Procyon lotor Raccoon
Mephitis mephitis Striped skunk
Mustela frenata Long-tailed weasel
Spilogale gracilis Western spotted skunk
Taxidea taxus American badger
Felis concolor Mountain lion
Lynx rufus Bobcat
Odocoileus hemionus Mule deer

PLANT SPECIES WITHIN THE PRESERVE

The following is a list of probable plant species found within the Preserve. This list is derived from several surveys which recorded species in terms of relative abundance.

▪ Species
PTERIDOPHYTES – FERNS AND ALLIES
POLYPODIACEAE – POLYPODY FAMILY
Polypodium californicum California polypody
Pentagramma triangularis ssp. Triangularis Goldenback fern
ANGIOSPERMAE – FLOWERING PLANTS
DICOTYLEDONES
AMARANTHACEAD – AMARANTH FAMILY
Amaranthus retroflexus Rough pigweed
ANACARDIACEAE – SUMAC FAMILY
Malosma laurina Laurel sumac
Rhus integrifolia Lemonadeberry
Schinus molle Peruvian pepper tree
Toxicodendron diversilobum Western poison oak
APIACEAE (UMBELLIFERAE) – CARROT FAMILY
Daucus pusilius Rattlesnake weed
Foeniculum vulgare Sweet fennel
Sanicula crassicaulis Pacific sanicle
ASCLEPIADACEAE – MILKWEED FAMILY
Asclepias fascicularis Narrow-leaved milkweed
ASTERACEAE (COMPOSITAE) – SUNFLOWER FAMILY
Acourtia microcephala Sacapellote
Ambrosia Psilostachya Western ragweed
Artemisia californica California sagebrush
Baccharis pilularis

Coyote brush
Baccharis salicifolia Mule fat
Centaurea melitensis Tocalote
Conyza Canadensis Common horseweed
Corethrogyne filaginifolia var. bernardina Common sand aster
Cynara cardunculus Cardoon/globe artichoke
Encelia californica Bush sunflower
Ericameria palmeri var. pachylepis Grassland goldenbush
Eriophyllum confertiflorum var. confertiflorum Long-stemmed golden yarrow
Filago gallica Narrow-leaved filago
Gnaphalium bicolor Bicolored everlasting/Bioletti's cudweed
Gnaphalium californicum California everlasting
Gnaphalium microcephalum White everlasting
Grindelia camporum var. camporum Big gum-plant/robust gum-plant
Helianthus annuus Western sunflower
Hemizonia fasciculate Fascicled tarweed
Heterotheca grandiflora Telegraph week
Hypochaeris glabra Smooth cat's ear
Usicina menziesii var. vernonioides Coastal goldenbush
Lactuca serriola Prickly lettuce
Lasthenia californica California goldfields
Layia glandulosa ssp. Glandulosa White tidy tips
Lessingia filaginifolia Cudweed aster
Malacothrix saxatilis var. tenuifolia

Cliff malacothrix
Picris echioides Bristly ox tongue
Sonchus asper Rough sow-thislte/prickly sow-thistle
Sonchus oleraceus Common sow-thistle
Stephanomeria virgata ssp. Virgata Tall wreath plant
Xanthium strumarium var. canadense Cocklebur
BORAGINACEAE – BORAGE FAMILY
Amsinckia menziesii Rancher's fiddleneck
BRASSICACEAE (CRUCIFERAE) – MUSTARD FAMILY
Brassica nigra Black mustard
Coronopus didymus Lesser wart cress
Hirschfeldia incana Shortpod mustard
Lepidium virginicum var. pubescens Wild peppergrass
Raphanus sativus Wild radish
CACTACEAE – CACTUS FAMILY
Opuntia littoralis Coastal prickly pear
Opuntia prolifera Proliferous prickly pear/coastal cholla
CAPRIFOLIACEAE – HONEYSUCKLE FAMILY
Sambucus mexicana Mexican elderberry
CARYOPHYLLACEAE – PINK FAMILY
Silene gallica Windmill pink/common catchfly
Spergula arvensis Corn spurry
Spergularia sp. Sand spurry
Spergularia bocconei Boccone's sand spurry
Stellaria media Common chickweed
CHENOPODIACEAE – GOOSEFOOT FAMILY

Atriplex semibaccata Australian saltbush
Atriplex suberecta Small saltbush
Chenopodium album Lamb's quarters
Chenopodium murale Nettle-leaved goosefoot
Salsola australis Russian thistle
CONVOLVULACEAE – MORNING GLORY FAMILY
Calystegia macrostegia Morning-glory
Convolvulus arvensis Field bindweed
Cuscuta californica var. californica California witch's hair
CRASSULACEAE – STONECROP FAMILY
Crassula connata Sand pigmy-stonecrop
Dudleya lanceolata Lance-leaved dudleya/lancelear/ Coastal dudleya/coastal live-forever
Dudleya pulverulenta Chalk dudleya/chalky live-forever
CUCURBITACEAE – GOURD FAMILY
Cucurbita foetidissima Coyote melon/calabazilla
Marah macrocarpus Wild cucumber/Cucamonga manroot
CUPHORBIACEAE – SPURGE FAMILY
Charaesyce albomarginata Rattlesnake weed/rattlesnake spurge
Eremocarpus setiger Doveweed
FABACEAE (LEGUMINOSAE) – LEGUME/PEA FAMILY
Lotus hamatus Grab lotus/San Diego lotus
Lotus scoparius Deerweed
Lotus unifoliolatus Spanish lotus
Lupinus bicolor Miniature lupine
Lupinus succulentus Arroyo lupine

Medicago polymorpha Bur-clover
Melilotus alba White sweet-clover
Melilotus indica Yellow sweet-clover
Trifolium willdenovii Tomcat clover/valley clover
GERIANIACEAE – GERANIUM FAMILY
Erodium botrys Long-beaked filaree
Erodium cicutarium Red-stemmed filaree
Erodium moschatum White-stemmed filaree
HYDROPHYLLACEAE – WATERLEAF FAMILY
Phacelia ramosissima var. austrolitoralis Beach phacelia
HYDROPHYLLACEAE – WATERLEAF FAMILY
Phacelia ramosissima var. austrolitoralis Beach phacelia
LAMIACEAE (LABIATAE) – MINT FAMILY
Marrubium vulgare Common horehound
Salvia apiana White sage
Salvia mellifera Black sage
MALVACEAE – MALLOW FAMILY
Malva parviflora Cheeseweed
Malacothamnus fasciculatus Bushmallow
NYCTAGINACEAE – FOUR-0'CLOCK FAMILY
Mirabilis californica var. californica Wishbone bush/California wishbone bush
ONAGRACEAE – EVENING PRIMROSE FAMILY
Epilobium canum California fuchsia
POLYGONACEAE – BUCKWHEAT FAMILY
Eriogonum elongatum Wand buckwheat
Eriogonum fasciculatum ssp. Fasciculatum California buckwheat
Rumex crispus

Curly dock
PORTULACACEAE – PURSLANE FAMILY
Portulaca oleracea Common purslane
PRIMULACEAE – PRIMROSE FAMILY
Anagallis arvensis Scarlet pimpernel
RANUNCULACEAE – CROWFOOT FAMILY
Ranunculus californicus var. californicus California buttercup
ROSACEAE – ROSE FAMILY
Adenostoma fasciculatum var. fasciculatum Common chamise
Heteromeles arbutifolia Toyon/Christmas berry
RUBIACEAE – MADDER FAMILY
Galium angustifolium ssp. Angustifolium Chaparral bedstraw
Galium porrigens var. porrigens Climbing bedstraw
SALICACEAE – WILLOW FAMILY
Salix gooddingii Black willow
Salix lasiolepis Arroyo willow
SCROPHULARIACEAE – FIGWORT FAMILY
Antirrhinum nuttallianum ssp. Nuttallianum Nuttall's snapdragon
Mimulus aurantiacus Bush monkeyflower
Scrophularia californica var. floribunda California figwort
SOLANACEAE – NIGHTSHADE FAMILY
Jimsonweed
Nicotiana glauca Tree tobacco
VERBENACEAE – VERVAIN FAMILY
Verbena lasiostachys var. lasiostachys Western verbena
MONOCOTYLEDONES – MONOCOTS
IRIDACEAE – IRIS FAMILY
Sisyrinchium bellum California blue-eyed grass
LILIACEAE – LILY FAMILY
Bloomeria crocea var. crocea

Goldenstars
Dichlostemma capitatum Blue dicts
POACEAE – GRASS FAMILY
Agrostis diegoensis San Diego bentgrass
Avena barbata Slender wild oat
Avena fatua Wild oat
Brachypodium distachyon Purple false brome
Bromus diandrus Ripgut brome
Bromus hordeaceus ssp. Hordeaceus Soft chess
Bromus madritensis ssp. Rubens Foxtail chess
Cortaderia selloana Sellow's pampas grass
Cynodon dactylon Bermuda grass
Elymus condensatus Giant wild-rye
Elymus triticoides Beardless wild-rye
Gastridium ventricosum Nitgrass
Hordeum murinum var. leporinum Foxtail barley
Lamarckia aurea Goldentop grass
Lolium perenne English ryegrass
Lolium temulentum Darnel
Melica imperfecta Small-flowered melic grass
Nasella lepida Foothill needlegrass
Nasella pulchra Purple needlegrass
Pennisetum setaceum African fountain grass
Polypogon monspeliensis Rabbit-foot grass

Vulpia myuros var. myuros Rattail fescue
TYPHACEAE – CATTAIL FAMILY
Typha domingensis Slender cattail

The following sections are taken from the Laguna Laurel Stewardship Plan, prepared by Trish Smith with the Nature Conservancy.

WILDLIFE HABITAT MANAGEMENT

General wildlife management objectives and techniques recommended to be implemented within the open space preserve include the following:

Protection of Breeding Territories and Nest Sites Breeding or nesting sites for sensitive species that are located during spring surveys will be protected by redirecting pedestrian traffic away from these areas and by posting signage that prohibits entrance into these areas.

Protection of Sensitive Plant Populations The health and disposition of sensitive plant populations would be updated as part of population surveys. Recommendations for management or enhancement of sensitive plant populations should be developed as needed, such as recommendations for protective fencing, weeding, or plant barriers.

Deadwood/Leaf Litter Removal Deadwood shall not be removed from natural habitat areas. Logs and branches provide valuable microhabitats for invertebrates, reptiles, small mammals and birds. In addition, the decomposition of deadwood and leaf litter is essential for the replacement of the soil's nutrients and minerals. Vegetation removal for trail maintenance shall be minimized to the extent feasible, and shall be overseen a qualified professional. Any vegetation removed for trail maintenance should be chipped and used as mulch for onsite habitat creation activities or for covering unauthorized trails.

Snags Snags (dead tree limbs) and dying trees shall not be removed from natural habitat areas, but shall be preserved for wildlife nesting and breeding habitat, unless they affect public safety, in which case they will be removed. Signs will be posted by these trees to prevent alteration.

CULTURAL RESOURCES

The City of Irvine's Open Space Preserve contains a rich historic past. Its resources include information of prehistoric and historic occupation. A diverse human occupation of this land spans 10,000-12,000 years. Within the Preserve are a number of known sites. Many of the sites are documented as part of adjacent development CEQA requirements, and have been fully mitigated. Other sites exist and could provide important new information.

Cultural resources will be preserved and protected within the Preserve. Looting and vandalism is a concern with any existing resource. Methods to reduce these risks will include the inventory and periodic monitoring of all known resources, vegetation screening may be provided to reduce the likelihood of trespass and damage, and master planning of facilities to reduce conflicts with known resources. Additional programs may be developed to increase the understanding of the value of cultural sites through educational programs and/or active monitoring and stewardship.

Due to the risk of vandalism, the location and types of resources are kept confidential by the Open Space staff. Access to this information for research and scientific work may be obtained by contacting the Irvine Open Space Administrator.

Recreation & Resource Management Plan

Recreation & Resource Management

Recreation and Resource Management

"A Thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it does otherwise".

– Aldo Leopold

REQUIREMENTS OF THE NATURAL COMMUNITIES CONSERVATION PROGRAM (NCCP)

The NCCP/HCP requires the City of Irvine to prepare and submit for review and approval to the California Department of Fish and Game (CDFG), and the United States Fish and Wildlife Services a Recreational Management Program that consists of a Resource Management Plan (RMP). These documents contained herein detail the policies and procedures for managing and monitoring the City's Southern Open Space Preserve.

Although the NROC is charged with the coordination and oversight of the creation of the Reserve and implementation of the Adaptive Management research and monitoring activities, the City of Irvine is charged with the actual management of the lands. The following are the items identified in the NCCP *Implementation Agreement* as Reserve Owner/Manager activities:

- Coordinating management activities with the NROC and assuring that such activities are consistent with the annually-approved work program.

- Prepare an annual work program for activities for the up-coming year in consultation with the Nature Reserve of Orange County (NROC).

- Provide an annual progress report to NROC on the current year work program for inclusion in the NROC overall annual report submitted to CDFG. Annual reports shall include at a minimum, the results of recreational use monitoring (e.g., trail conditions, adverse habitat impacts). Specific recommendations involving modification to existing management practices aimed at minimizing adverse impacts on biologic resources resulting from recreational use. Recommendations to initiate new management programs in response to changing circumstances/conditions (e.g., educational programs, trail patrols).

- Accept ownership and management responsibility for City of Irvine Reserve system lands upon transfer by private owners.

- Conduct or allow NROC or other appropriate public agency or non-profit to conduct specific Adaptive Management measures required under the current NROC work program, including:

  Restoration
  Enhancement
  Habitat management
  Public access/recreational management
  Reserve system and pubic access facility maintenance
  Cooperation in fire management including controlled burns
  Cooperation in invasive plant and animal species control

Additionally with regard to Public Access, the NCCP Plan has established section 5.8, Public Access and Recreation Policies. The Public Access and Recreation Policy of the NCCP states that effective management shall demonstrate ability to:

- Effectively monitor and manage trails and facilities

- Enforce user compliance with NCCP/HCP policies and GDP/RMP (General Development Plan/Recreation/Resource Management Plan) policies

- Provide technical reserve management expertise

- Provide funding for the above adequate to assure that proposed access/recreation use can be accommodated consistent with the NCCP/HCP polices and the General Development Plans and Resource Management Plans.

At the time the NCCP/HCP Plan was prepared, the County of Orange was in a Master Planning process for the several areas of wilderness lands. At that time, the areas that are now City of Irvine lands were a part of that planning process. As a result, the NCCP/HCP Plan anticipated the County of Orange Environmental Management Agency and Harbors Beaches and Parks, (EMA, HBP) as be the entity managing these lands. As such, language in Section 5.8.6 of the recreation policy defines that County EMA, HBP prepare a Recreational Management Plan prior to the establishment of permanent access, uses or facilities. These plans are required for the facilities shown in the NCCP/HCP plan on figure 28. These facilities are those located within the City's Open Space Preserve in Bommer and Shady Canyons, and Quail Hill.

Now that the City of Irvine is the managing entity, and the facilities we would like to implement are those shown on figure 28 of the NCCP/HCP plan, the U.S. Department of Fish and Wildlife has determined that as a "reserve owner manager", under the definition in the Implementation Agreement, they City of Irvine shall have the same requirement to prepare a Recreation and Resource Management Plan. This plan will address future

access uses and facilities of parks located within the Reserve System. The plan shall be submitted to California Department of Fish and Game, and The U.S. Fish and Wildlife Service for review and approval. Then the NROC will approve the plan. Approval of the plan by these agencies will provide authorization, by NROC, for the City to move forward with general park operations, phased public access programs, trail development and maintenance, and land management projects.

The City of Irvine Open Space Preserve Resource and Recreation Management Plan will be based on the adaptive management approach described in the NCCP.

The NCCP Planning Guidelines adopted by CDFG for the coastal California gnatcatcher recommend that an "adaptive management" regime should be implemented to manage biological resources within the sub-region.

ADAPTIVE MANAGEMENT

Adaptive Management as defined by the NCCP, "shall mean the flexible, iterative approach to long-term management of biotic resources that is directed over time by the results of ongoing monitoring activities and other information. Biological management techniques and specific objectives are regularly evaluated in light of monitoring results and other new information. These periodic evaluations are used over time to adapt both the management objectives and techniques to better achieve overall management goals"

The following elements are intended to ensure the maintenance of the long-term habitat and recreational value of the open space. Many of these activities will be conducted by others including the NROC and developers, however, the city will approve and coordinate these activities on city lands in coordination with the NROC

- Management of public access and recreation;
- Monitoring and associated adaptive management of the biological resources located within the preserve in coordination with NROC.
- Restoration and enhancement actions (other than creation of new CSS habitat) such as eradication of invasive, non-native plant species, predator control grazing management plans, construction of additional spadefoot toad breeding sites;
- Management carried out by means of short-term and long-term fire management programs approved by NROC;
- Management designed to minimize the impacts of ongoing operations/maintenance of uses that existed prior to approval of the NCCP/HCP;
- Assurance that permitted infrastructure uses proceed in the manner provided for in the NCCP/HCP in order to minimize impacts of new uses to be allowed within the preserve;
- Restoration and enhancement measures through the creation of new CSS habitat to offset potential loss of net long-term habitat value due to

development of CSS habitat located outside the Reserve System by "non-participating landowners"

- Field research and studies designed to contribute to the long-term protection of habitats and species and other basic research of habitats and species included within the reserve;
- Fire management activities consistent with the NCCP/HCP and fire management plans;
- Recreation and public access, consistent with the policies contained in the adaptive management program, including
    - Passive recreation and activities such as hiking, nature interpretation and picnicking;
    - Mountain biking and equestrian activities on designated trails,
    - Camping in designated locations;
    - Continued operation of pre-existing park facilities, including active recreation facilities within disturbed areas, provided that existing active facility expansions, or conversion of passive use facilities to active use must be consistent with the NCCP/HCP;
    - Park and reserve administrative and interpretive facilities, and
    - Construction, operation and maintenance of new facilities necessary to support permitted recreation uses, including concessions that support permitted uses/activities within the reserve.
- Activities related to the provision and operation of necessary public and quasi-public infrastructure facilities
- Existing uses consistent with Section 5.11 of the NCCP/HCP.

CITY OF IRVINE MANAGEMENT GOALS

The City of Irvine has a long established history of protecting and preserving large areas of valuable open space. The open space ballot initiative anticipated the preservation of the land and included recreational amenities to the residents. The following are broad goals that encompass this purpose:

- Assure the preservation and conservation of City of Irvine open space lands. The city will adhere to the monitoring criteria that NRROC establishes in the Monitoring Plan and will monitor the preserve through patrols.

- Protect and maintain existing natural resources.

- Provide valuable "wilderness type" passive recreational and educational activities

- Restore and/or enhance degraded habitats to improve biological productivity and diversity within the preserve.

OPEN SPACE PRESERVE FACILITIES AND OPERATIONS

The following section outlines the various facilities and amenities necessary for the operation of these lands as an Open Space Preserve. The facilities will be sited and designed consistent with the NCCP Public Access and Recreational Policies (Section 5.8). The NCCP habitat reserve design was, "*formulated with the understanding that public access, passive recreation uses and development of future recreation facilities would be compatible with and permitted within the habitat Reserve System … and policies reflect a determination that there is not an inherent conflict between the recreation uses permitted …and protection of sensitive biotic resources.*" (NCCP Plan Section 5.8)

TRAILS

Recreational trails are primarily limited to existing trails and truck roads in order to minimize damage to open space resources. In addition, limited development of new trails will be needed in order to connect open space areas. Connections to Laguna Coast Wilderness Park and Crystal Cove State Park are an essential part of the open space circulation concept. New trail linkages will be provided to:

- Complete trail linkages for trail system
- Connect to new Trailhead locations
- Connect to Planning Area 27 Overlook, and
- Bypass Bommer Canyon Cattle Camp

Southern Open Space contains miles of existing truck trails. Some of the truck trails are in good locations and can be used for park trails; others will need to be re-located or abandoned. Many of the truck trails were not designed for recreational use and are fairly eroded. These trails will require costly maintenance, reconstruction, relocation, and/or abandonment. Abandoned trails may require regrading and/or revegatation to restore them to natural condition.

The trails shall be designated as "multi-use" or "hiking only." The majority of the trails will be multi-use trails that could accommodate hikers, mountain cyclists, and equestrians. Hiking only trails are limited to sensitive habitat areas in Shady Canyon. Trail users will be restricted to fairly well-defined areas with off-trail encroachment into heavily vegetated and sensitive resources prohibited. Along the trails are several overlook areas offering panoramic views of the Irvine Southern Open Space as well as distant foothills and mountains.

As a primary mandate of NCCP/HCP, protection of sensitive resources will be a paramount concern. Well managed and controlled preserve access and trail use will afford recreational opportunities compatible with protected natural resources.

Preserve operations and public use may be restricted when necessary to minimize impacts to sensitive habitat, to prevent user conflicts with wildlife and where degraded site conditions impact user safety. Trail use shall be prohibited for appropriate periods following rains to avoid trail damage and impacts on adjacent habitat.

Unauthorized trails will be eliminated and impacted habitat restored. Trail use will be monitored through patrols to minimize off-trail use. The intensity of trail and facility use will be monitored and modified as appropriate based on observed conditions to assure that overuse does not occur and impact target species or sensitive habitats, consistent with NROC established guidelines or procedures.

Placeholder for:
Exhibit C - Trails Map

TRAILHEADS

- **Quail Hill Trailhead**

  This 2.8 acre public trailhead is located on the west side of Shady Canyon Drive in Planning Area 16 (this trailhead is not located in the NCCP). The trailhead will serve as the public gateway to the City's southern open space areas. The staging area and improvements will be designed to be handicap accessible and to comply with the Americans with Disabilities Act.

  The trailhead project meets the state and federal requirements for handicap accessibility. The project's trails and paths are designed in accordance with requirements for slope gradients. The parking lot includes two handicap spaces, 50 percent of all picnic tables are handicap accessible, and the benches have space for companion seating. Specialty features to enhance handicap accessibility consist of an accessible path to the information kiosk and a handicap horse mount.

  The trails leading south out of this Trailhead allow users to continue south to the recently constructed Shady Canyon Regional Riding and Hiking Trail and Class 1 Bicycle Trail. Trail users may also cross Shady Canyon Drive into the community park, where the trail will access a Nature Trail leading to the open space areas to the east. The City's General Plan includes a future bicycle and equestrian trail leading west from the Trailhead through the Quail Hill open space to Mason Regional Park and the San Diego Creek Channel. The bicycle trail runs north to Sand Canyon Avenue Class 1 Trail and the northern part of the City. The equestrian trail does not continue to the north as the General Plan riding and hiking trail network does not include a northern leg from this location.

  The improvements include:
  - Trail access for equestrian, mountain bike and pedestrian use
  - Parking lot for 25 vehicle spaces and 10 pull through vehicle/trailer parking spaces
  - Restroom building with staff office (775 SF)
  - Kiosk/signage
  - Hitching post (6)
  - Drinking fountain (1)
  - Hose bibs (4)
  - Handicap horse mount (1)
  - Picnic tables (4)
  - Bike racks (2)
  - Trash receptacle (5)
  - Benches (3)
  - Maintenance yard (100' x 50')

Expansion Features Include:

- Eco-Challenge course
- Ropes course
- Climbing wall
- Trail in PA 16 connecting this area with the Jeffery Open Space Spine

- **Bommer Canyon Trailhead**

  Bommer Canyon Road Staging Area will be located at the mouth of Bommer Canyon. Access from this staging area will bypass the Bommer Canyon Cattle Camp. Staging area and improvements will comply with the Americans with Disabilities Act and be accessible to all. The improvements to this area should include:

  - Trail access for mountain bike and pedestrian use
  - Parking for vehicles
  - Restroom building with staff office
  - Kiosk/signage
  - Drinking fountain
  - Picnic tables
  - Bike racks
  - Trash receptacle
  - Benches
  - Maintenance yard

Old Laguna Canyon Road Trailhead

This staging area is planned along Old Laguna Canyon Road in Planning Area 17, adjacent to the Edison easement. Parking and entry site for the open space is comprised of disturbed annual grassland. Staging area and improvements will comply with the Americans with Disabilities Act and be accessible to all. The improvements to this area should include:

- Trail access for equestrian, mountain bike and pedestrian use
- Parking for vehicles and horse trailers
- Restroom building with staff office
- Kiosk/signage
- Hitching posts
- Drinking fountain
- Hose bibs
- Picnic tables
- Bike racks
- Trash receptacle
- Benches
- Maintenance yard

Laguna Canyon Road Trailhead

This staging area is planned approximately 1,600 feet from the park limit at the edge of Laguna Coast Wilderness Park, across from Planning Area 18. Parking and entry site for the open space is comprised of disturbed annual grassland. Staging area and improvements will comply with the Americans with Disabilities Act and be accessible to all. The improvements to this area should include:

- Trail access for equestrian, mountain bike and pedestrian use
- Parking for vehicles and horse trailers
- Restroom building with staff office
- Kiosk/signage
- Hitching posts
- Drinking fountain
- Hose bibs
- Picnic tables
- Bike racks
- Trash receptacle
- Benches
- Maintenance yard

VISITOR FACILITIES

Wilderness Center

The Wilderness Center is proposed to be located in PA 17 on the Quail Hill Community Park The park is ideally located adjacent to the City's Southern Open Space. The Center will serve as an information and education center with interactive displays, native plant gardens, an outdoor adventure play area, classrooms, conference rooms, and training rooms for corporate and community groups.

Nature Center

The Nature Center is located at the edge of the Southern Open Space Preserve, in Turtle Rock Community Park, and serves as a focal point for Open Space operations. This five-acre preserve has paved trails, a small stream and a duck pond. The building is a converted horse stable and contains photo displays, staff offices and educational resources. A number of environmental programs are offered at this site, including the nine-month Kids and Nature kindergarten program.

Future plans for the center include the following:

- Redesign of interior display area to accommodate open space exhibits and/or a building addition

- Removal of exterior animal cages and pens to accommodate native plant garden
- Habitat restoration of the five acre preserve

Bommer Canyon Cattle Camp

This facility is one of the existing uses identified in the NCCP. This area is used for special events, camping, hiking, mountain biking etc. This area will go through a Design Planning process to redesign the cattle camp and upgrade the dated facilities. The existing uses will remain.

The City's completed a review of the existing buildings and determined that the current structures do not meet the criteria for a historical designation. The current facilities do not meet the City's building codes.

The Design Planning process for the Bommer Canyon Cattle Camp is underway. The project scope for this facility will be determined by community consensus workshops within the following guidelines suggested by the 1998 conceptual master plan:

Use.

- Continue to be utilized by groups on a reservation basis
- Special events will continue
- No equestrian staging will be permitted at the Cattle Camp. Equestrian groups may use Bommer Canyon if equestrian staging occurs elsewhere.

Vehicular Access.

- New vehicular access road may be needed with bridge structures at creek crossing that will accommodate access to the Cattle Camp and replace the road along the main channel that gets frequently flooded
- Existing paved access road may be used for future trail access along eastern boundary of the canyon adjacent to the existing stream channel.

Parking.

- Existing disturbed grassland area to the east of the channel may continue to be used for overflow event parking
- Limited parking can be provided at the group camping area, or other areas as design permits

Facilities

- Group campsites located near the Cattle Camp can accommodate tents. They contain fire rings, picnic tables, restroom facilities, drinking fountains, and trail access.
- Accessibility: the Cattle Camp area and improvements will comply with the Americans with Disabilities Act and be accessible to all.
- Revegetation: revegetation adjacent to the old access road will reinforce a visual screen to future development along the adjacent ridge.

FENCING AND SIGNAGE

Fencing

Trail fencing should be provided where needed to control trespass, confine users within the trail width, or for safety, such as at steep slope areas, bridges, adjacent golf courses, high traffic, and other potentially hazardous areas.

Fences shall be made of sustainable, recycled plastic or concrete wood look products and wire cable. Barbed wire is not permitted. Plantings such as trees hedges or large rocks can also serve as trail fencing or barriers. Other fencing may be acceptable as trail fencing with the approval of the Director of Community Services.

See Design Standards and Guidelines for City of Irvine's Open Space Trails and Facilities (References and Attachments Section) for fencing types.

Signage

A minimum of signs shall be installed in order to control and direct visitor uses along with trail maps, route descriptions, brochures, etc. Signs should only be provided for visitor information, safety, and resource protection. They should range in size and complexity from small simple arrow directional posts at trail junctions, to regulatory signs posting open space rules as well as signs denoting resource features and points of interest. To protect the natural scenic quality of the natural open space areas, visitor information kiosks and signs will utilize natural earth-tone colors and natural sustainable or recycled materials. The preferred location of signage shall be at trailheads or the main entrances to open space. A signage program will be developed separately.

The Southern Open Space will include several types of signs, typical examples are described below.

- **Entry Monumentation Signs**

Entry signage will be located at gateways to the open space. These points of access shall include the Bommer Canyon Road entrance, the Quail Hill Trailhead entrance, the Old Laguna Canyon Road Trailhead and the Laguna Canyon Road Trailhead and/or others. These signs should designate the entrance to the open space in a manner compatible with the natural resources. Use of natural materials is preferred.

- **Kiosk Bulletin Board Signs**

Kiosk bulletin board signs should be provided at each Trailhead. Kiosk/bulletin board sign should include, at the minimum:

- Information advising trail users of rules and regulations, trail etiquette, potential hazards, permitted trail uses, and emergency information.
- Explanation of accessibility levels in practical clear wording
- A map(s) of the trail and/or trail system, showing:
    - Each trail, including trail name, allowed users, length to the nearest ¼ mile, and lowest and highest elevation points of the trail
    - Location of rest areas and/or Trailheads
    - Trail highlights, such as view points
    - Any hazards and seasonal conditions, if applicable
    - Creek beds and wetland areas
    - Common plants (i.e., poison oak), and animals
    - Hours of operation
    - Phone number where to obtain trail maps and other trail information

- **Trail Signs**

Trail signs should be located at the entrance to the trails and at major trail intersections. These signs should contain the following information:

- Trail name
- Trail direction
- Mileage or approximate length
- Allowed users
- Trail user yielding signs
- Distance to the nearest rest area(s) and/or staging area(s)

- **Other Signs**

Other signs may include, but are not limited to:

- Trail name signs may be placed at entry points, halfway points, and other points where trail identification is needed.

- Destination signs may be placed at appropriate locations to inform trail users of the distance and destination on various routes. These signs should be accompanied by directional arrows where confusion with other routes is possible.

- Directional signs may be placed at intersections with roads or other trails, where paths could be confused. Directional signs should be placed, as appropriate, to clarify trail destination and direction to trail users.

- Informational signs may be used to provide miscellaneous information about the trail including restroom locations, mileage markers, water, etc.

- Intersection signs may be placed at intersections to warn both the trail user and oncoming traffic.

- Warning signs may be placed on the trail to warn trail users of hazardous conditions on the trail. Signs should identify hazard points, clearance requirements, or safety precautions, as warranted.

- Trail user yielding signs should be placed at all trail heads and posted periodically, especially at trail crossings and along trails that accommodate a variety of users.

PUBLIC ACCESS

Public Access shall be accommodated through trails and limited facilities which are intended to protect the public's health and safety as well as provide a valuable "wilderness type" recreation experience. In order to avoid the degradation of sensitive or unique resources and as a means to implement effective adaptive management strategies to offset or minimize, other potentially adverse impacts, the carrying capacity of open space areas shall be developed. These will be developed over time depending upon the anticipated type and intensity of use.

If the visitor use threatens to adversely impact an area's natural characteristics, or habitat value, appropriate actions shall be taken to prevent any further decline and allow natural regeneration or other processes to occur. In most cases, indirect methods of reducing impacts such as limiting parking capacity, access points, trail design, and pubic education efforts shall be preferred over initiating direct regulatory procedures. However, where these methods prove to be unsuccessful or considered inadequate, further restrictions may be necessary. Depending on the situations, these may include either partial or complete closure, restricting periods of use and number of visitors permitted access.

It must also be recognized that visitor use of the open space preserve involves certain risks as a consequence of the rugged terrain, the unpredictability of the natural environment, and the potential isolation form urban services. Although the visitor must accept these risks, in response to a need for assistance, the open space staff shall take appropriate and timely action to coordinate necessary law enforcement and medical emergency services.

Permitted Uses

The City of Irvine Open Space Preserve – South shall be managed to provide for passive recreation use and enjoyment by the public in ways consistent with the preservation of its natural resources and characteristics. The following uses are permitted:

- Passive Recreation activities such as hiking, mountain biking, equestrian use, picnicking, camping, photography/filming, painting, etc.

- Conservation and mitigation projects, student research or other educational programs involving the study of nature, ecology, earth sciences, or other appropriate subjects

- Outdoor programs, lectures, musical events, and organized community activities.

Accessibility

Due to the nature of the existing topography, much of the open space preserve may not be fully accessible. The City will endeavor to provide as much accessibility as possible, and may include staffed van tours and some trails that will accommodate powered wheelchairs and four-wheel drive wheelchairs.

The Quail Hill Trailhead will be equipped with an equestrian wheelchair ramp in order to provide equestrian access to individuals in wheelchairs. This trailhead is adjacent to the Shady Canyon Trail that is accessible and meets the grade requirements of the American's with Disabilities Act.

The one-mile nature loop trail, located at the Bommer Canyon Cattle Camp will be designed to be fully accessible. This area may also have a built-in Braille trail. Headsets with accompanying audio tapes describing the local plants and animals will be available for visitors to check out and use during their visit.

All certified service animals will be permitted on all of the wilderness trails and in all open space facilities and trailheads.

Prohibited Uses

Except where necessary for the management of the preserve resources, or as specifically approved by the Director of Community Services, the following uses shall be strictly prohibited:

- Operation of motorized vehicles beyond the limits of established public access roads and designated parking areas is not permitted except for those vehicles authorized to access the preserve for purposes of management, maintenance, accessibility programming, police and fire service, by easement or special permit.

- Fires, campfires, camp stoves, and smoking except in designated areas and fire rings.

- Release of non-native animals.

- Overnight camping except by permit and in designated areas.

- All forms of fishing, hunting, trapping, falconry, or use of poisonous baits within any open space area.

- Any action on the behalf of a person or persons that creates a nuisance, poses a real or immediate threat, results in damage to, or destruction of open space resources or public property.
- Removal or the intentional destruction of existing vegetation for any reason including arson, or the illegal harvesting or collection of native plant materials for person use or sale.

- The creation of non-approved trails.

- Littering or dumping of trash and debris or disposal of hazardous waste materials with the preserve

- Swimming and wading

- Petting zoos

- Artifact, plant and animal collecting except for approved research and study (access into the preserve for research and study will be coordinated and monitored through the Open Space staff. Access guidelines will be established and a special access permit will be issued.)

- Domestic animals including dogs and/or exotic animals except as listed below:

  Certified service animals will be permitted. Owners will be required to follow cleanup procedures.

  Horses will be permitted on all of the multi-use trails, and at all trailhead areas and facilities. Equestrian staging will not be permitted at the Bommer Canyon trailhead.

  Dogs may be permitted in designated areas located outside NCCP boundaries.

Grazing of livestock including utilization of natural forage for commercial purposes shall be prohibited unless specifically approved by the Director of Community Services.

Phased Operation and Access Strategies

The acquisition of open space by the City of Irvine is dependent upon the phasing of development. The City will identify appropriate public access as part of its budget process. Operational models and access strategies are dependent upon availability of funds and habitat sensitivity. This Plan is designed to function at all levels of public access from "Docent Only Access" to "Open Preserve Hours" from sunrise to sunset, seven days per week.

The phased operational plan consists of following three elements:

- Land Management and Administration
- Land Maintenance & Safety
- Program Management

Land Management and Administration

As signatories to the NCCP and landowners, the City is required to meet specific mandates for management of the land as a Nature Reserve. This entails coordinating the activities conducted by the Nature Reserve of Orange County including mitigation projects, biological monitoring, census data collection and annual reporting. The administration of this function will be coordinated through the City's Community Services Department using appropriate resources such as providing the service by contracting specialists, or by a staff Resource Ecologist.

Land Maintenance and Safety

The City will conduct land maintenance to ensure public safety and welfare and to meet the NCCP maintenance requirements. This maintenance may consists of fencing, gates, signage for control of public access and liability issues, removal of litter, trail maintenance, grading for emergency access, repair and maintenance due to erosion and flooding, and regular staff patrols to monitor visitor use. The administration of this function will be coordinated through the City's Community Services Department. The services will be provided by city staff, or contracted out.

Program Management

The City will provide public access to the preserve through a phased access program. The access strategies are dependent upon availability of funds and habitat sensitivity. The three phases of the access program may consist of the following:

1. Docent/Staff Led Tours
2. Docent/Staff Led Tours and Open Access on Weekends
3. Docent/Staff Led Tours and Open Access Year Round

Docent/Staff Only Access

Under this scenario, the public has access to the preserve only via tours guided by a trained docent or staff. Access will require advance reservation and is limited to certain times. This scenario requires heavy docent use and minimal park maintenance staff.

Docent/Staff Led Tours and Open Access on Weekends

Under this scenario, the preserve has more typical open hours on Saturdays and Sundays, when the public can use the park without a docent. Docent and staff lead tours are still available. This scenario requires heavy docent use to lead the docent tours and moderate park staff to provide supervision and maintenance for the weekend tours.

Docent/Staff Led Tours and Open Access Year Round

Under this scenario, the preserve has typical open hours most of the week when the public can use the park. Some docent lead tours are also available. This scenario requires more staff to provide supervision and maintenance, and less Docent use.

Recreational Uses

Recreational activities will be monitored to ensure appropriate visitor safety and habitat protection. All uses within the NROC will meet NCCP guidelines. Recreational uses will include:

Hiking

Hiking will be permitted on the approved hiking and multi-use trails. Hiking opportunities will be available, by reservation, through the City's Community Services Department's scheduled programs, or through the open access days as the preserve is scheduled for regular operating hours.

Mountain Biking

Mountain biking will be permitted on the approved mountain biking and multi-use trails. Mountain biking opportunities will be available, by reservation, through the City's Community Services Department' s scheduled programs, or through the open access days as the preserve is scheduled for regular operating hours.

Horseback Riding

Equestrian opportunities will be permitted on the approved multi-use trails. Horseback riding opportunities will be available, by reservation, through the City's Community Services Department' s scheduled programs, or through the open access days as the preserve is scheduled for regular operating hours. The Quail Hill Trailhead (PA17) will serve as the primary equestrian staging area. Equestrian staging will not be permitted at the Bommer Canyon Trailhead, however equestrians may stage at Quail Hill and ride into Bommer Canyon.

Picnicking

Picnicking opportunities will exist at the following areas:

- Open Space Preserve: Wilderness Center Facility
- Open Space Preserve: Bommer Canyon Facility
- Open Space Preserve: Nature Center Facility
- Quail Hill Trailhead (PA 17)
- Bommer Canyon Trailhead
- Old Laguna Canyon Road Trailhead
- Laguna Canyon Road Trailhead

Informal picnicking will be allowed throughout the preserve. Signage, visitor guidelines, and educational efforts will emphasize the need for visitors to pack out all trash and picnic items and to refrain from feeding wildlife.

Camping

Camping opportunities will be permitted at the Bommer Canyon Facility on a reservation basis, or other defined campgrounds. Participants may either reserve the area through the City's Facility Reservation process, or register to attend one of the quarterly campouts offered by Community Services. Participants must pre-register. Staff will be scheduled at all campouts to provide supervision and visitor assistance.

Infrastructure

Within the Open Space Preserve infrastructure facilities exist and were intended as part of the NCCP plan. These facilities are necessary for public health and safety and may include: waterlines, reservoirs, and associated facilities (pump stations, pressure control facilities, access roads), sewer lines and pump stations, electric, telephone, cable television, and natural gas facilities, storm drain and flood control facilities, landfill gas recovery facilities, borrow sits, access roads, monitoring wells and maintenance facilities.

Access to the preserve will be needed routinely for the maintenance of and/or construction of new facilities. Each utility shall coordinate work with the City's

designee. All work shall be consistent with the Infrastructure Policies of the NCCP (Section 5.9), and City of Irvine standards.

Special Access Permits

Special access permits will be issued by City's designee for research, special activities, or other events deemed appropriate for authorized groups and individuals. Permit guidelines will be established and monitored by staff.

Enforcement Procedures

Applicable local, state and federal laws and/or ordinances pertaining to the protection and use of this preserve, whether originating at the local, regional, sate, or federal level will be in effect and enforced. Trail user groups shall be encouraged to participate in "self-monitoring and policing" programs to minimize instances of off-trail activities and other abuses to habitat resources within the preserve.

Signage shall be used to clearly indicate appropriate behavior in the Preserve. Open Space staff, docents, volunteers, signage and educational programs shall be used to communicate to trail users and other public users the importance of restricting recreational use to the designated trails.

Safety and Security Measures

The Preserve is a wilderness area and is, therefore subject to some inherent public dangers. The public will be informed of these dangers by posting standard "Wilderness Warning" and/or other public safety signs where appropriate.

Emergency Procedures

Emergency procedures (police, fire, paramedic response) will be established and coordinated by the appropriate agencies. Evacuation plans in case of fire or floods will be developed and reviewed on an annual basis with the appropriate agencies.

COMMUNITY OUTREACH AND EDUCATION

Outreach and Education Plan

Public outreach and education programs are vital elements of the City's Open Space Management Goals. Programs emphasizing environmental education may be offered, through the Community Services Department, at the Open Space facilities and trailheads. Educational efforts will focus on fostering stewardship and teaching visitors how to recreate responsibly. Programs will be conducted by staff, docents, volunteers, and specialized contracted professionals. The goal is to provide focused educational presentations and programs for all ages and user groups.

Programs may consist of guided hikes, summer camps, nature walks, adult classes, community presentations, exhibits, signage, educational brochures, trail guides, after-school classes, classroom in the field programs, the Kids and Nature program, a speaker's

bureau, and regularly published newsletters and articles. Special events, restoration projects, and cleanup days will be developed and incorporated into the programming efforts.

Additional outreach efforts may focus on presentations and newsletter articles for members of Irvine's Home Owner's Associations. These programs could focus on teaching residents how they can become an open space land steward. The Good Neighbor Program is an established community outreach program currently being implemented throughout the county. The program provides information to local residents about the implications of living in close proximity to a wilderness park.

Collaborative Programs

Programs may be offered that combine the expertise and resources of local agencies, non-profits, volunteer groups and individuals.

For example, collaborative programs may be developed and implemented with representatives from the following:

- The Nature Conservancy
- The Nature Reserve of Orange County
- Irvine Unified School District
- Irvine Valley College
- Irvine Ranch Water District
- Sea and Sage Audubon
- The Irvine Museum
- Orange County Wild
- University of California, Irvine
- Home Owner Associations
- Laguna Coast Wilderness Park
- Crystal Cove State Park
- Equestrian Groups
- Walking and hiking groups
- Mountain Bike Groups

Docent and Volunteer Programs

Docent and volunteer programs will provide the essential support necessary for the Outreach and Education plan. Qualified participants will conduct hikes and programs, monitor visitor use, help with trail maintenance and assist with revegatation and restoration projects. Other volunteer assignments may include special projects, administrative support, and research studies. All docents and volunteers will be processed through the City of Irvine's volunteer procedures, and will complete a comprehensive training program. Possible categories for the volunteer program are listed below.

Docents:

To become interpretative docents, individuals must pass an intensive course in environmental studies focusing on interpretation of Orange County's flora and fauna, geology, and cultural history. Docent students are also given an overview of the Central Coastal NCCP/HCP and sensitive natural resources. Field trips conducted by local experts (i.e. geologists, botanists, birders, etc.) are important components of the docent course.

The docent program's primary goal is to give the public an understanding of the importance and sensitivity of the preserve's natural resources. By installing an appreciation for the preserve's ecosystem, it is more likely future visitors will respect and protect its natural resources.

Trail Guides

Trail Guides will have opportunities to volunteer in a number of different areas. They could provide staff with program support and serve as sweeps on hikes and guided tours. They could greet visitors at trailheads and community centers, answer phones at facilities, or operate the gift shop at the Wilderness Center. Trail Guides could also provide visitors with information about trail safety and etiquette, and monitor trail use and conditions as they tour the preserve. They could also assist staff with special operational or educational projects, such as display work, photo documentation, and brochure and flyer development.

Land Stewards

Land Stewards will assist staff with trail maintenance and management, native plantings, cleanup projects, restoration and revegatation projects, and other resource management projects.

Cultural Stewards

Cultural Stewards will assist staff with the monitoring and protection of the Southern Open Space Preserves cultural resources.

Collaborative Volunteer Programs

The City will work with local volunteer groups and other agencies to develop and implement appropriate collaborative programs and projects. Collaborative volunteer programs could include the following agencies:

- Orange County Conservation Corp
- California Conservation Corp
- Equestrian Groups
- Share Mountain Biking Group

- Trails 4All
- The Ameri Corps

RESTORATION, ENHANCEMENT, and MITIGATION

Much of the Open Space Preserve has been used over the past 100 years for cattle grazing and farming. As a result, the habitat is presently in a very mixed condition. Although the majority of the habitat is in good, sometimes pristine condition, a number of grassland areas are degraded, and areas that have been recently used for agriculture are taken over in non-native weeds.

Approximately 200 acres of the Southern Open Space is in need of restoration or enhancement. Habitat Restoration areas will include agricultural and disturbed (non-wildland) areas. Much of the landscape in these areas is currently occupied by annual grassland, but shows potential for restoration to Coastal Sage Scrub and native grasslands. Restoration, Enhancement and Mitigation will enhance key linkages and combine currently fragmented segments into larger habitat blocks.

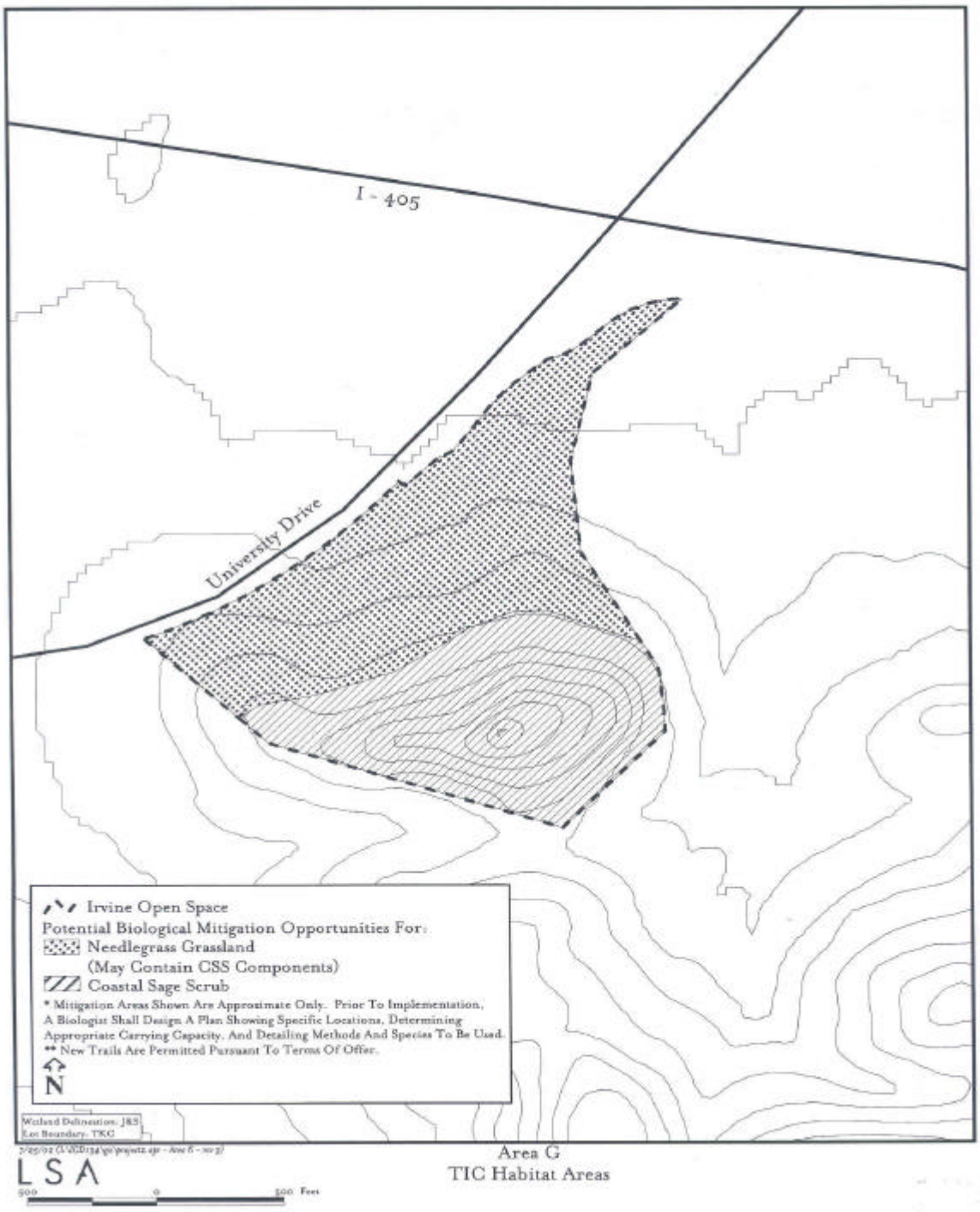
For purposes of this document and the operations of the Preserve, Restoration shall mean the transition of habitats containing non-native plant materials to habitats containing only native materials. These can be small or large scale projects, completed as maintenance, by volunteer forces, or by contracted forces. These projects can include removal of non-native materials as well as planting of new materials. Any project other than maintenance will be coordinated with The NROC. Enhancement Projects are generally small-scale projects that increase the amount or type of existing plant material within a habitat area. These will generally be accomplished as maintenance or as volunteer projects. Mitigation refers to those projects by others required by CEQA and the Resource Agencies to mitigate impacts to other areas. These projects are completed by others, and require coordination with the Open Space Administrator. These projects generally require a performance criterion that is the responsibility of others. These projects can vary in scale.

As part of the city's Open Space Agreement, The Irvine Company has retained rights to provide habitat mitigation within the preserve. These areas are shown on Exhibit E. Areas have been identified for various habitat types. Within the areas identified on the exhibits, The Irvine Company may mitigate by notifying and coordinating with the City. Other areas require additional coordination and approval for mitigation. All Habitat Restoration, Enhancement, and Mitigation shall meet the requirements of the NCCP Plan Policy Section 5.6.

Placeholder for:
Exhibit D: Restoration Projects Map

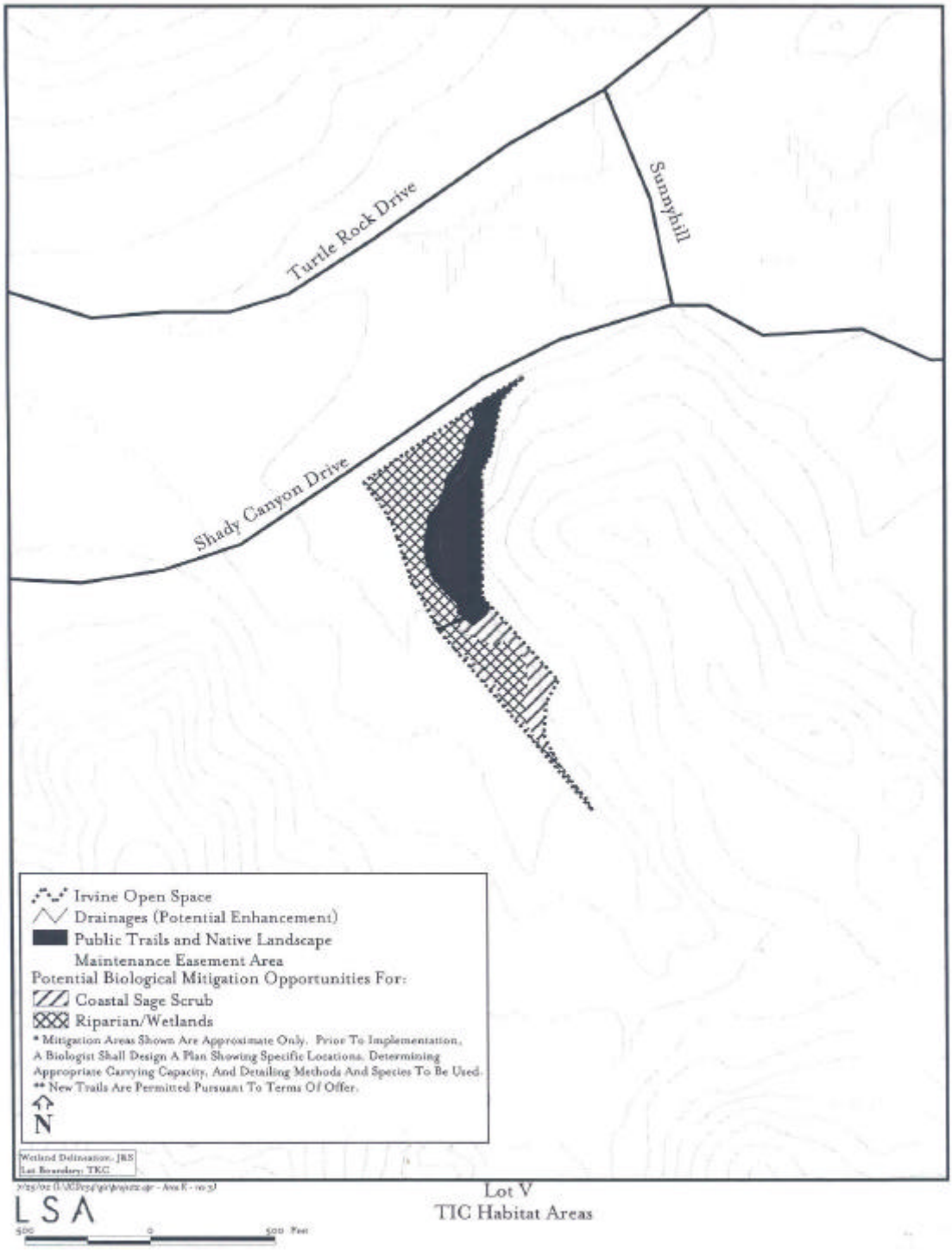
MITIGATION SITES MAPS

EXHIBIT E



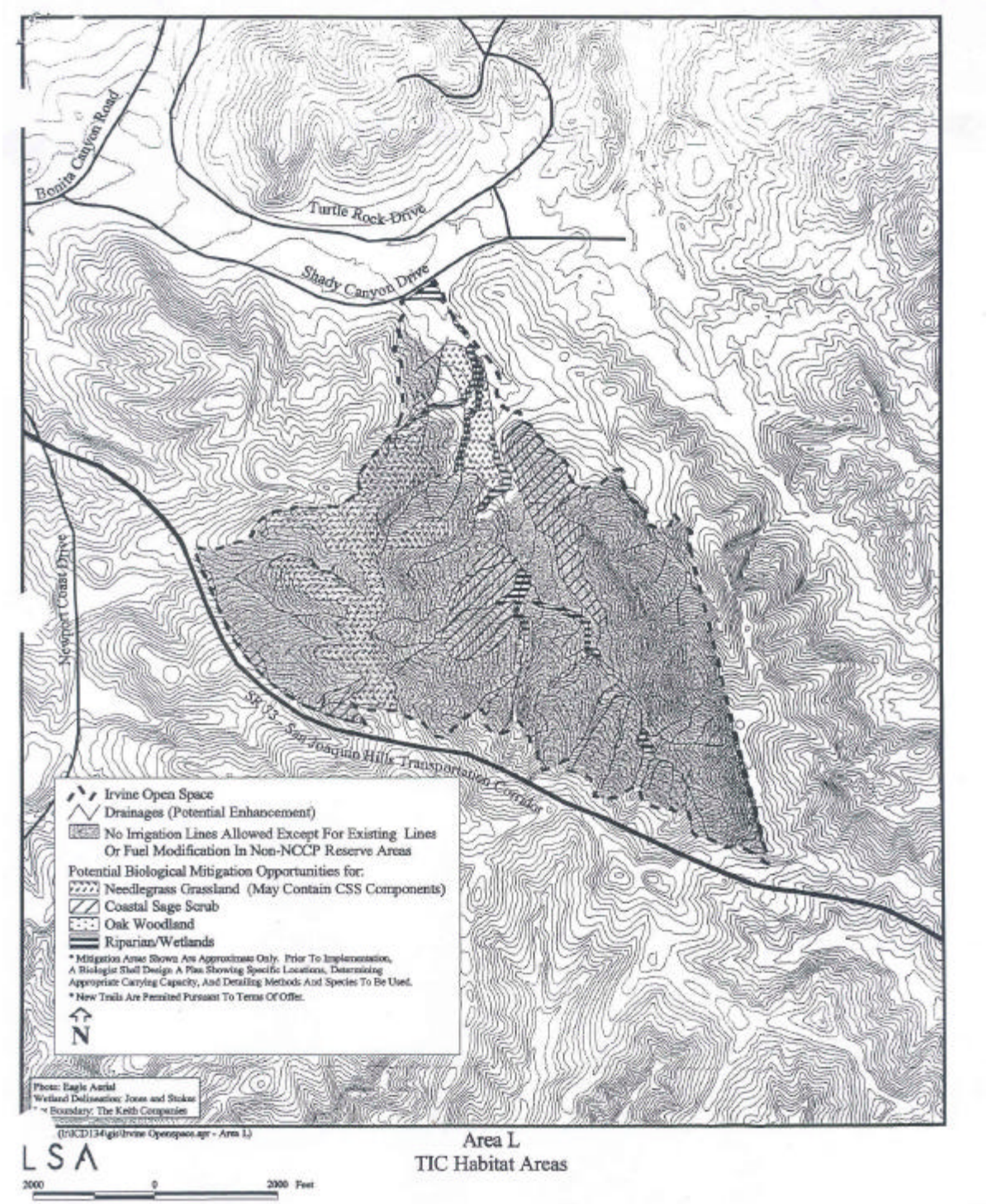
MITIGATION SITES MAPS

EXHIBIT E



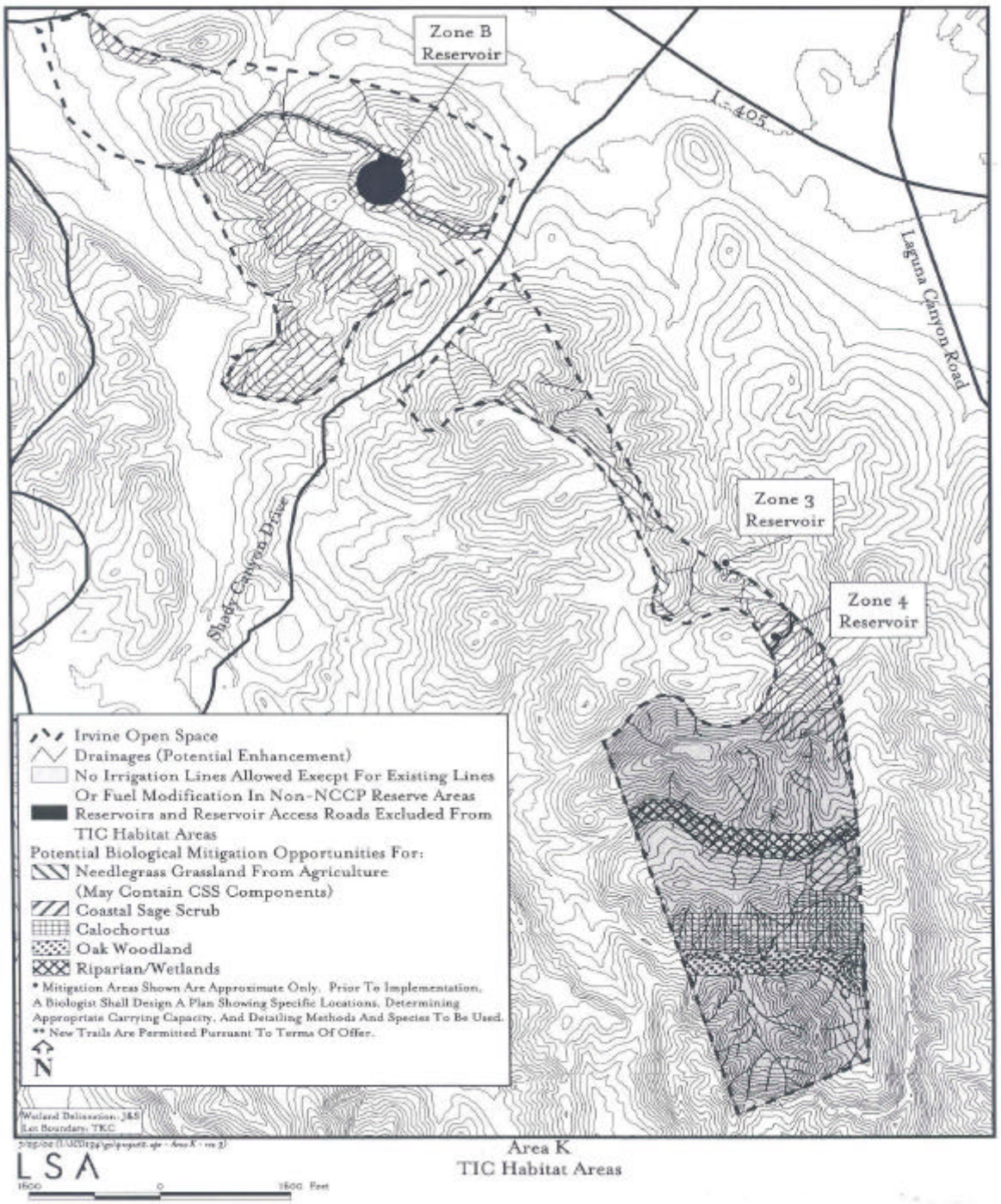
MITIGATION SITES MAPS

EXHIBIT E



MITIGATION SITES MAPS

EXHIBIT E



FEE STRUCTURES AND FUNDING OPPORTUNITIES

Fees for all Open Space activities must be reviewed and approved by the Irvine City Council. Fees may be charged for the following activities: parking, special events, group tours, school tours, guided hikes, campout programs, scout hikes, and children's camps.

Facility Reservations

The Bommer Canyon facility may be rented by group users and presently offers the following amenities: picnic tables, horseshoe pits, volleyball court, chuck wagon, small stage, barbeque, fire ring, and areas for overnight tent camping.

Donation and Sponsorship Programs

Structured donation programs will be developed and may include some of the following themes:

- Adopt an Animal
- Adopt a Trail
- Adopt an Acre
- Corporate Sponsors

ANNUAL WORK PLAN

The NCCP/HCP Implementation Agreement (IA) requires that an annual workplan be submitted to the NROC Board of Directors. The City of Irvine will prepare and submit the annual workplan for the Southern Open space Preserve that meets the following criteria established by NROC:

- Coordinate management activities with the NCCP Non-Profit Corporation and assure that such activities are consistent with the annually-approved work program.

ANNUAL PROGRESS REPORT

The NCCP/HCP requires (in Section 5.8.3.) that an annual report be submitted to the NROC Board of Directors. The City of Irvine will prepare and submit an annual progress report for the Southern Open Space Preserve that meets all of the criteria established by NROC as stated in the IA: "Prepare annual reports regarding management activities with the City's portion of the Reserve System for submittal to the NCCP Non-Profit Corporation for inclusion in the annual report to CDFG and USFWS." The annual report will include:

- The results of recreational use monitoring including trail conditions, adverse habitat impacts, etc.

- Specific recommendations involving modifications to existing management practices to minimize adverse impacts on biological resources resulting from recreational use.

- Recommendations to initiate new management programs, such as educational programs or trail patrols in response to changing circumstances and conditions.

COORDINATION WITH OTHER NATURE RESERVE OF ORANGE COUNTY PLANS

As part of the NCCP Plan several management programs were to be undertaken. NROC is charged with the preparation of the following plans:

- Fire Management Plan
- Restoration and Enhancement Plan
- Recreation Monitoring Plan
- Exotic Plant Control Plan
- Invasive and Pest Species Control Plan

Per the NCCP plan, chapter 5, the City of Irvine will comply with the above management plans that are included as attachments, or by reference herein.

Recreation & Resource Management Plan

References & Attachments

References and Attachments

LIST OF ACRONYMS

ACOE	U.S. Army Corp of Engineers
CDFG	California Department of Fish and Game
CSS	Coastal Sage Scrub
EIR/EIS	Environmental Impact Report and Environmental Impact Statement
FESA	Federal Endangered Species Act
GDP	General Development Plan
HCP	Habitat Conservation Plan
MOU	Memorandum of Understanding
NCCP	Natural Community Conservation Plan
NCCP/HCP	Natural Community Conservation Plan and Habitat Conservation Plan
NROC	Nature Reserve of Orange County
RMP	Resource Management Plan
TIC	The Irvine Company
TNC	The Nature Conservancy
USFWS	U. S. Fish and Wildlife Service

CITY OF IRVINE
OPEN SPACE PRESERVE
South

Recreation & Resource Management Plan

Design Standards and Guidelines for City of Irvine's Open Space Trails and Facilities

FIRE MANAGEMENT PLAN

TO BE PREPARED BY THE NATURE RESERVE OF ORANGE COUNTY

EXOTIC PLANT CONTROL PLAN

TO BE PREPARED BY THE NATURE RESERVE OF ORANGE COUNTY

INVASIVE AND PEST SPECIES CONTROL PLAN

TO BE PREPARED BY THE NATURE RESERVE OF ORANGE COUNTY

RECREATION MONITORING PLAN

TO BE PREPARED BY THE NATURE RESERVE OF ORANGE COUNTY