

INITIATIVE RESOLUTION 88-1

AN INITIATIVE RESOLUTION OF THE CITY OF IRVINE
DIRECTING THE AMENDMENT OF THE CONSERVATION
AND OPEN SPACE ELEMENT AND THE LAND USE
ELEMENT OF THE IRVINE GENERAL PLAN

WHEREAS, the City Council of the City of Irvine has determined that an opportunity exists to establish significant open space areas for the benefit of the citizens of the City of Irvine and, with the cooperation of the major landowner, to achieve public ownership of significant portions of that open space by transferring development opportunities from these open space areas to other areas which can better accommodate development in exchange for the transfer of the open space to the public; and

WHEREAS, the City Council has determined that such a major issue ought to be subject to the electoral process and has therefore submitted this resolution directing the amendments of the Conservation and Open Space Element and Land Use Element of the Irvine General Plan to the voters of the City of Irvine for their approval.

THE PEOPLE OF THE CITY OF IRVINE HEREBY RESOLVE AS FOLLOWS:

Section 1. Purposes and Intent

It is the intent of this resolution that the City of Irvine establish a program to implement and accomplish the following objectives, consistent with the following Sections of this initiative resolution, and to assure that the conservation and open space areas designated in this resolution for public ownership will be obtained through the provision of a phased dedication and compensating development opportunities program as described herein.

- a. To consolidate important conservation and open space areas into large contiguous areas that may be integrated into local and regional open space areas.
- b. To establish a network of open space spines linking the consolidated conservation and open space areas.
- c. To assure the preservation of conservation and open space areas through a phased dedication and compensating development opportunities program, acceptable to the City and the owner of the land involved, which transfers development opportunities from conservation and open space areas and consolidates them in appropriate development areas.

Section 2. Conservation and Open Space and Land Use Map Changes

The City's General Plan shall be amended to reflect the changes shown on the Conservation and Open Space and Land Use Map attached hereto as Exhibit "A".

Section 3. Conservation and Open Space General Plan Policies

The City Council shall incorporate, as a minimum, the following conservation and open space policies into the General Plan for the conservation and open spaces areas shown on Exhibit "A":

- a. Mitigation of adverse biotic habitat impacts through the programmatic enhancement of other, more significant open space resources shall be encouraged.
- b. Roads, transit related facilities, arterial highways, transportation corridors, and utilities, and other necessary infrastructure may be located in preservation areas.
- c. Prior to transfer to public ownership, agricultural uses in preservation areas shall be permitted uses.
- d. The designation of specific preservation areas and development opportunities in the Conservation and Open Space Element and Land Use Element are made to implement a planning principle of clustering development within an open space system, and special development criteria shall be adopted which allows realization of such development opportunities within hillside areas.

Section 4. Phased Dedication and Compensating Development Opportunities Program Directives

The City Council shall adopt a phased dedication and compensating development opportunities program in the General Plan in accordance with the following components.

a. Phased Dedication Program

The policies set forth in the Phased Dedication Program are to be considered integral components of both the Conservation and Open Space Element and the Land Use Element of the General Plan. The Phased Dedication Program shall integrate the Land Use and Conservation and Open Space Elements together by establishing a program which links the dedication of conservation and open space areas to the development entitlement process. The purpose of the Phased Dedication Program is to provide permanent protection of open space by means of public ownership.

With the completion of the Phased Dedication Program, all major open space preservation areas required to assure the appropriate balance of development and open space will be secured. No additional open space dedication exactions will be imposed except as ordinarily required for compliance with provisions of the City's subdivision ordinance on a project by project basis.

b. Compensating Development Opportunities Program

The City Council shall establish a Program for acquisition of conservation and open space areas by transferring development opportunities from the conservation and open space areas to appropriate development areas in the following manner:

1. Development potential in the upper Lomas de Santiago Hills reaches of the Santiago Hills (Lomas Ridge) shall be shifted to areas in the northern foothills and flatlands, and;
2. Development potential in Quail Hill (Village 16), portions of Villages 12 and 17, portions of Shady and Bommer Canyons (Village 22) and portions of the San Joaquin Marsh Area (Village 19) shall be shifted to Villages 12, 13, 17, 18, 19, 25, 26 and 33.

The Program shall be implemented consistent with the following guidelines:

1. The Program shall be the subject of an agreement between the City and the landowner prior to implementation.
2. Open space spines shall generally be dedicated in conjunction with development of adjoining lands.
3. Relatively isolated preservation areas may be dedicated in conjunction with development of adjoining lands.
4. The major preservation areas shall be incrementally dedicated in phases in conjunction with development of the development areas.

Section 5. Required City Actions in Support of the Conservation and Open Space Element and Land Use Element Amendments

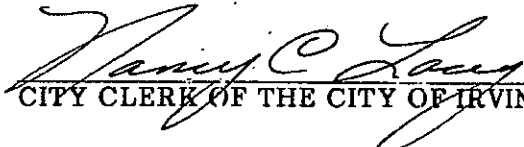
The City Council is hereby directed to take appropriate actions to assure the following:

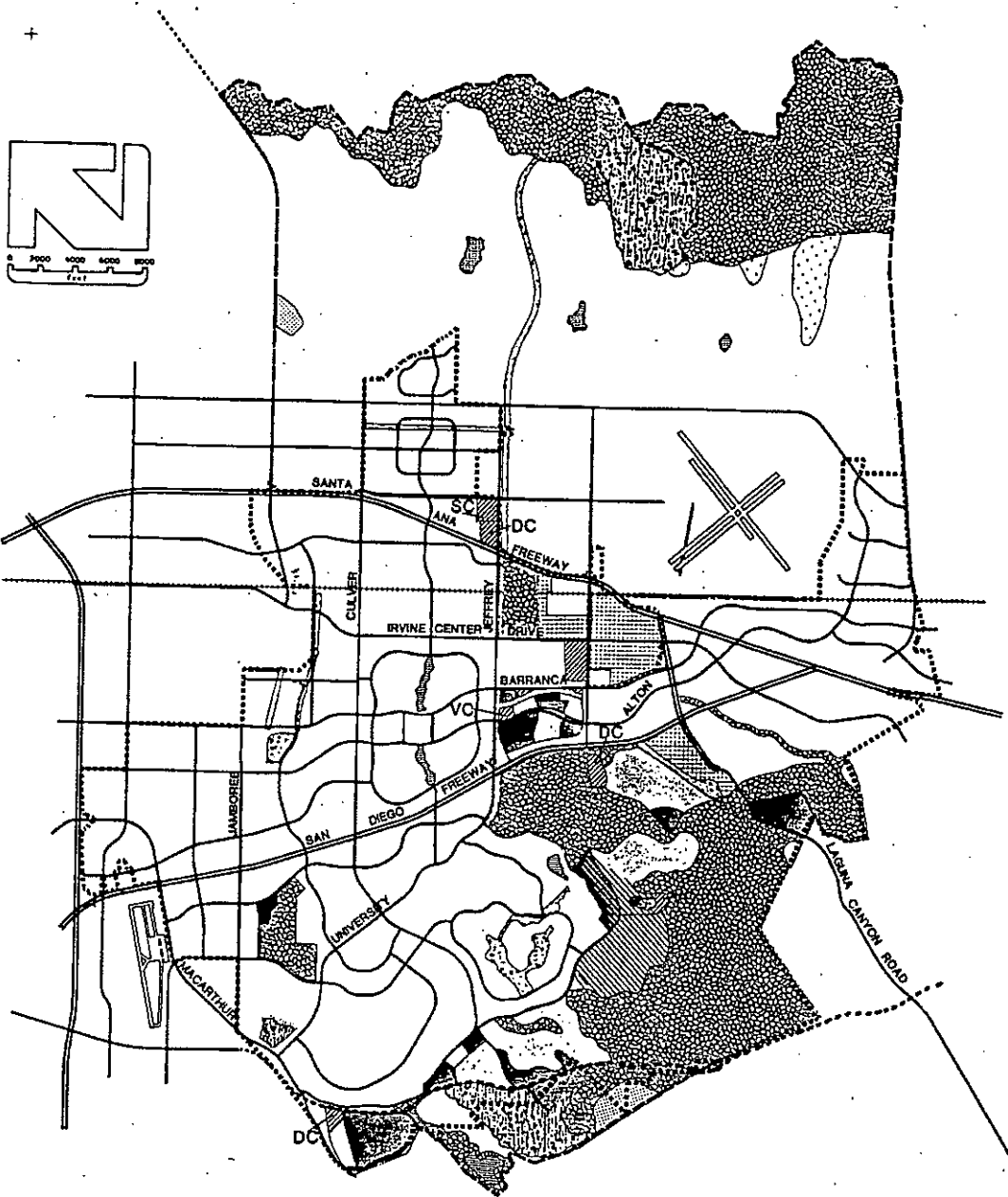
1. Amendment of any General Plan elements necessitated by this measure, by December 15, 1988.
2. Implementing and monitoring actions required to assure conformity of City zoning and subdivision ordinance with the General Plan amendments enacted pursuant to this measure shall be completed on or before June 30, 1989. These actions shall implement the phased dedication and compensating development opportunities program and revisions pursuant to the amendments of the Conservation and Open Space Element and Land Use Element.

ADOPTED by vote of the people of the City of Irvine on June 7, 1988, as certified by the Orange County Board of Supervisors on the 21st day of June, 1988.

STATE OF CALIFORNIA)
COUNTY OF ORANGE) SS
CITY OF IRVINE)

I, NANCY C. LACEY, City Clerk of the City of Irvine, HEREBY DO CERTIFY that the foregoing Resolution was adopted by the voters of the City of Irvine as an initiative measure at an election held on June 7, 1988, as certified by the Orange County Board of Supervisors on the 21st day of June, 1988, and that the Resolution became effective on June 7, 1988.


CITY CLERK OF THE CITY OF IRVINE



CONSERVATION/OPEN SPACE ELEMENT AND LAND USE ELEMENT AMENDMENTS

AMENDMENT AREAS (SHOWN AS PATTERNS):

CONSERVATION/OPEN SPACE

- Preservation
- Recreation
- Water Bodies
- Agriculture
- Golf Course Overlay
- Landfill Overlay

RESIDENTIAL

- Rural (Less than .1 DU/Acre)
- Estate (0.1 to 1.0 DU/Acre)
- Low (1.0 to 5 DU/Acre)
- Medium (5 to 10 DU/Acre)
- Medium-high (10 to 25 DU/Acre)
- High (25 to 40 DU/Acre)

- COMMERCIAL
- VC-Village Commercial
- DC-District Commercial
- SC-Specialty Commercial

GENERAL INDUSTRIAL

- MIXED USE
- INSTITUTIONAL

AREAS NOT A PART OF BALLOT MEASURE (SHOWN FOR REFERENCE):

- Open Space unchanged from current General Plan.
- White areas (undesignated) are subject to uses shown on current General Plan and except for Village 33 are not a part of this measure.

NOTE: Circulation pattern is shown for reference only and is not a part of this ballot measure.



Open Space Preserve North Recreation & Resource Management Plan

City of Irvine
Community Services Department

- 2009 -

*"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 the navy, nor to make wagons,
but stand and decay for higher uses...a
common possession forever, for instruction
and recreation."*

Henry David Thoreau



2009

Mayor and City Council

Sukhee Kang, Mayor
Larry Agran, Mayor Pro-Tempore
Dr. Steven Choi
Beth Krom
Christina Shea

Community Services Commission

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Special Thanks

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

Chris Meloni, Senior Biologist, LSA Associates, Inc.
Blake Selna, Senior Biologist, LSA Associates, Inc.
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Adam Maywhort, Irvine Ranch Conservancy
Pamela Chana, Former COI Community Services Manager
The United States Fish and Wildlife Service
The California Department of Fish and Game
Cathy Tucker, Tucker Consulting

Acknowledgements

This document includes information compiled from the following sources:

- California Parks and Recreation: Laura Westrup, Winter 2003, Educating Trail Users: Advice for Planning Interpretive Trail Signs and Exhibits (Westrup 2003)
- Conejo Open Space Conservation Agency Management Policies and Guidelines
- Laguna Laurel Stewardship Plan, Orange County, California: Prepared by The Nature Conservancy, The Irvine Company Open Space Reserve
- Natural Community Conservation Plan and Implementation Agreement (County of Orange 1996)
- Nature Reserve of Orange County – Central/Coastal Subregion-Habitat Restoration and Enhancement Plan (LSA 2003)
- Photographs provided by the Irvine Ranch Conservancy and LSA Associates, Inc.

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Recreation & Resource Management Plan

INTRODUCTION

INTRODUCTION

IRVINE OPEN SPACE 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.

STATEMENT OF PURPOSE

The City of Irvine (City) will ultimately own over 6,600 acres of open space lands (over 2,600 acres located in the northern portion of the City and over 4,000 acres located in the southern portion). The City accepted the first 1,764 acres of northern open space prior to the preparation of this document. The remaining acres of the northern open space are expected to be accepted after 2012. The City will have responsibility for the management and operation of these lands.

As a signatory to the Central and Coastal Subregion Natural Community Conservation Plan (NCCP) and Habitat Conservation Plan (HCP), 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 (RRMP) prior to the establishment of permanent access, uses, or facilities. This RRMP is prepared to address the future access uses and facilities for the City's Open Space Preserve – North (OSPN). An RRMP has already been approved and established for the City's Open Space Preserve – South (OSPS).

EXECUTIVE SUMMARY

The City 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 of the successful implementation of the City's General Plan with the inclusion of a Conservation and Open Space Element.

A landmark City 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. To implement this initiative, the City and the Irvine Company 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 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 NCCP/HCP was to create a multiple-species, multiple-habitat subregional 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 subregion.

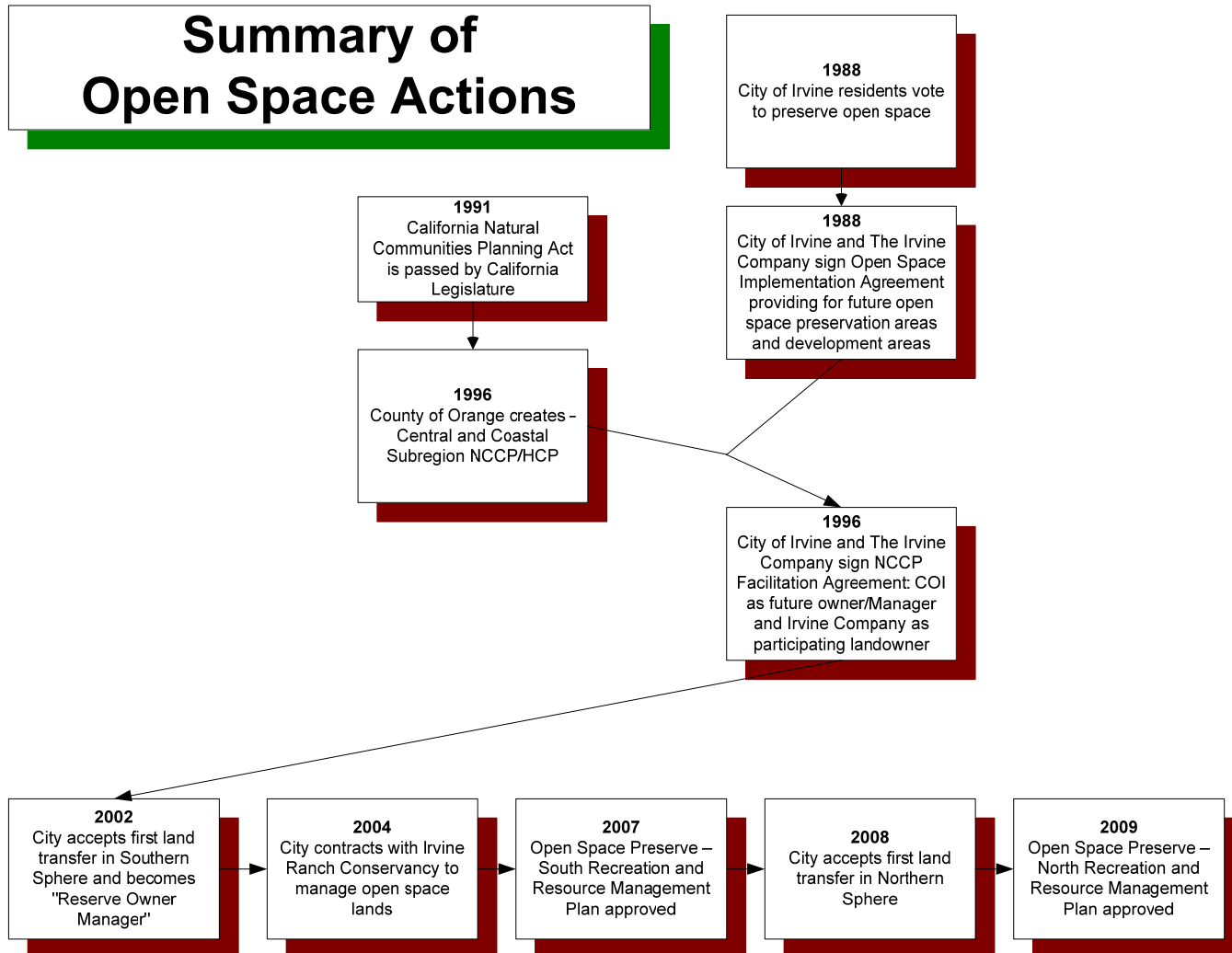
The City became a signatory to the NCCP and Implementation Agreement in 1996 along with 20 other participants, including State, regional, local agencies and jurisdictions, affected landowners, utility companies, and the University of California, Irvine. The Nature Reserve of Orange County (NROC) was created as a nonprofit entity to manage the NCCP Reserve System.

The City is a member of the NROC Board of Directors, participates in the quarterly Board meetings, and may participate in monthly Executive Board meetings. As a signatory to the NCCP, the City 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 RRMP. This RRMP describes future access plans, permitted uses, planned trails and trailheads, and visitor facilities located within the habitat Reserve System. This RRMP is submitted for review and recommendation to the City’s Community Services Commission, the City Council, the California Department of Fish and Game (CDFG), and the United States Fish and Wildlife Service (USFWS).



Summary of Open Space Actions



PROJECT LOCATION

The City's OSPN is a "belt" of open space lands that stretches from the east side of State Route 261 (SR-261) near Peter's Canyon southeast to the Foothill Ranch community. The OSPN is not one contiguous body but is more or less trisected by State Route 241 (SR-241), the Frank R. Bowerman Landfill (FRB Landfill), and Limestone Canyon Open Space (LCOS).

The southeastern portion of the OSPN is bounded by SR-241 to the south and west, by the Foothill Ranch community at the southeastern/eastern limit of the OSPN, and by LCOS and the FRB Landfill to the north and east. The northeastern portion of OSPN is bounded by SR-241 to the west, undesignated open space lands at Loma Ridge to the north and east, and by LCOS to the south. The northwestern portion of the OSPN is bounded by SR-241 to the east, by open space lands around Siphon Reservoir that are owned by the Transportation Corridor Agencies (TCA) to the south, by Planning Area (PA) 1 (Orchard Hills) to the west, by SR-261 to the northwest, and by undesignated open space lands to the north at Loma Ridge.

The Irvine OSPN is part of a larger open space system, as shown on the Regional Context Map (Exhibit A). Open space lands that lie in close proximity to the OSPN are LCOS to the northeast, El Toro National Wildlife Refuge to the south, Peter's Canyon Regional Park to the west, and undesignated open space lands to the north. Other open space lands that are of relatively large size in the region include Whiting Ranch Regional Park, Cleveland National Forest, Irvine Regional Park, the Orange County Great Park, and Irvine Company conservation easements encompassing areas of Gypsum Canyon, SilMod (Silverado and Modjeska Canyons), Fremont Canyon, East Orange, and Weir Canyon.

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 (County) population.

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

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,

Exhibit A: Regional Context Map

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 of the successful implementation of the City's General Plan with the inclusion of the Conservation and Open Space Element.

Open Space Initiative

On June 7, 1988, City residents approved a landmark ballot initiative to preserve open space within the City. 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.
- Ensure 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 MOU was crafted to implement the terms of the initiative. The MOU between the City and the Irvine Company 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 development. 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 the City'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 percent of allowed development in the district. Table A shows the list of lettered parcels with the approximate amount of open space acreage. The City may accept the land 90 days following the issuance of building permits for 75 percent of the development (residential units and nonresidential square footage, as shown on Exhibit 2 of the MOU), or upon completion of development in the district, whichever occurs first. The last phase of the MOU ensures that the City still receives the open space if the Irvine Company were to decide to build less than the allowed development in the district.

Table A: City Land Ownership: Open Space Preserve – North (acres*)

Location	2002–2007	2008	Future	Cumulative Acreage
Parcel P	744			744
Parcel A+B		1,020		1,764
Parcel Q			273	2,037
Parcel R			584	2,621

* All acreages are approximate

This program provides for permanent protection of significant, large-scale conservation and open space areas by public ownership. Presented in Table A is the schedule for the City’s acquisition of the land parcels that will comprise the OSPN. 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.

Natural Community Conservation Plan (NCCP)

The 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 California Endangered Species Act (CESA) 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 NCCP/HCP. The successful implementation of the NCCP/HCP allows for the conservation of large diverse areas of natural habitat for the California gnatcatcher and 41 other “identified species” and their associated habitats.

In May 1996, the City, the County, various other cities, and landowners entered into an agreement to place certain lands within the NCCP Reserve (Exhibit B) and to commit to specific responsibilities under the NCCP/HCP. Some of the City’s responsibilities include the following: consider adding General Plan amendments and ordinances to implement the NCCP/HCP, review project proposals to ensure consistency with the NCCP, make efforts to acquire conservation easements from landowners not participating in the NCCP, and formally commit certain City-owned open space lands to the Reserve system.

Exhibit B: NCCP Overlay Map

Southern California Coastal Sage Scrub (CSS) Program

The Southern California 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 CSS NCCP is made up of 11 subregions covering 6,000 square miles in a five-county area. The Central and Coastal Subregion is one of the 11 subregions and encompasses 208,000 acres of developed, agricultural, and undeveloped lands (an area encompassing approximately 40 percent of the County). Within the Central and Coastal Subregion are approximately 104,000 acres of existing natural habitat, including 34,392 acres of CSS. The City's OSPN comprises approximately 2,621 acres of this program.

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

The NCCP/HCP for the Central/Coastal Subregion was prepared by the County and was approved on July 10, 1996, by the County, participating local jurisdictions, the USFWS, and the CDFG. As a signatory to the NCCP/HCP, the City 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 CSS habitat mosaic by creating a habitat Reserve system that contains substantial CSS, 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; and
- Protecting the federally listed coastal California gnatcatcher (all scientific names are presented in Appendix B) in a manner consistent with Section 10(a) of the FESA and the Special 4(d) Rule for the gnatcatcher while providing for future incidental take of the species

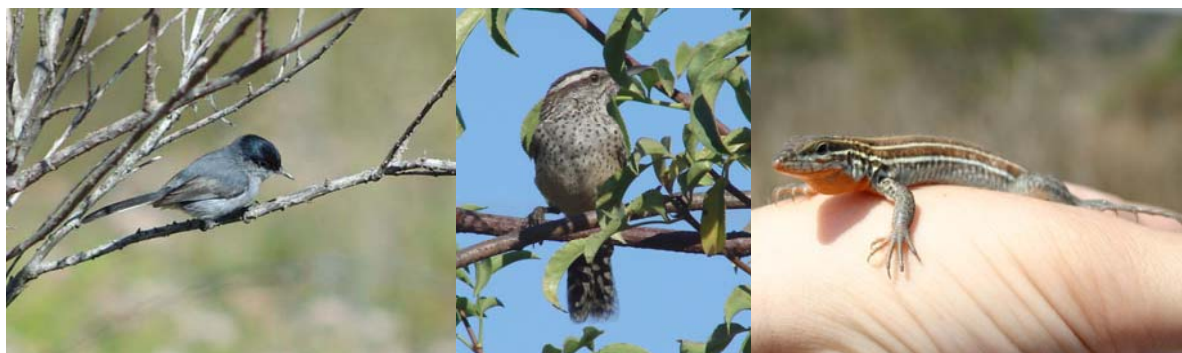
The NCCP/HCP guidelines designated three “target” species to be used as surrogates for planning purposes in the CSS habitat. Long-term protection of the habitat for these three target species is intended to also protect sufficient CSS habitat to benefit a much broader range of CSS-related species. The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

- Coastal California Gnatcatcher
- San Diego Cactus Wren
- Orange-throated Whiptail Lizard

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 CSS (oak woodland, Tecate cypress forest, cliff and

rock, and chaparral within the Coastal Subarea). 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 FESA and the 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.



Coastal California Gnatcatcher

San Diego Cactus Wren

Orange-throated Whiptail Lizard

The Nature Reserve of Orange County (NROC)

The first application of the NCCP/HCP in the central/coastal subregion of Orange County was the establishment of NROC, a 37,000-acre area designed to protect the habitat of CSS communities and the three target species found predominantly in this habitat. The Reserve will protect more than 18,800 acres of 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 Nonprofit Management Corporation, NROC, consisting of representatives from each of the following:

- Each local government owning land in the Reserve (to date includes County of Orange, City of Irvine, City of Laguna Woods, and City of Laguna Beach)
- Southern California Water District
- Irvine Ranch Water District
- Southern California Edison
- Metropolitan Water District
- Transportation Corridor Agencies
- Irvine Company
- 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 nonprofit entity owning land within the Reserve
- Three public representatives appointed by the Board of Directors
- Nonvoting ex-officio member representing the California Department of Forestry
- Nonvoting ex-officio member representing the Orange County Fire Authority

The Nonprofit 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 City's OSPN is enrolled in the Central and Coastal Subregion NCCP Program and is within NROC.

REVIEW AND APPROVAL PROCESS

The City's OSPN RRMP was submitted for review and comment to the City's Community Services Commission, then forwarded to the Irvine City Council.

The document will be submitted for final approval by the CDFG and USFWS and accepted by the City Council.

UPDATES AND AMENDMENTS

City Staff will review the City's OSPN RRMP annually to determine whether updates/amendments are warranted.





Recreation & Resource Management Plan

EXISTING CONDITIONS

EXISTING CONDITIONS

As a consequence of development, grazing activities in the past, and agriculture in this area, some native habitats have been modified, while others, in the steeper hills and canyon bottoms, remain undisturbed. In addition, the foothills of the Santa Ana Mountains provide an important link to larger regional habitat areas, including Cleveland National Forest, Chino Hills State Park, O’Neill Regional Park, and the Audubon California Starr Ranch Sanctuary.

Key societal features include the FRB Landfill; archaeological, historical, and paleontological resources; orchard crops; and residential and industrial development.

TOPOGRAPHY

The OSPN is located within the Lomas de Santiago in the northwest portion of the Peninsular Range Geomorphic Province. The Lomas de Santiago are considered foothills to the Santa Ana Mountains and are located from the Tustin Plain to the south to Santiago Canyon in the north. The area consists of rolling terrain with moderately steep slopes, canyons, and narrow ridges. A prominent cliff face known as Loma Ridge lies in the northwestern portion of the OSPN. Other significant geological features are spectacular rock outcroppings, many of which contain eroded sandstone caves. The highest geographical point of the OSPN is located at the northern end of the OSPN, along Loma Ridge, where the elevations rise to just above 1,300 feet (ft) above sea level at several locations. The lowest geographical point is located near the mouth of East Hicks Canyon, where the elevation is 440 ft above sea level.

GEOLOGY AND SOILS

The OSPN is located within the Lomas de Santiago, which are in the extreme northwestern end of the Peninsular Range Geomorphic Province. The area includes sedimentary rocks with both marine and nonmarine origins, representing oscillations in an ancient sea level as well as tectonic uplift.

The OSPN area is a series of northeast-trending hills and canyons along a larger northwest-trending ridge. Exposed within the canyons and ridges are Cretaceous through late Miocene sedimentary rocks that are occasionally 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 Santa Ana Mountains and subsequent erosion.

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

- Capistrano Formation, Oso Member–late Miocene
- Puente Formation, La Vida Member–late Miocene
- Puente Formation, Soquel Member–late Miocene

- Topanga Formation—early-middle Miocene
- Sespe Formation (nonmarine)/Vaqueros Formation (marine)—Late Oligocene (Arikarean) to early Miocene
- Santiago Formation—Middle Eocene
- Silverado Formation—Paleocene age
- Williams Formation, Pleasants Sandstone Member—late Cretaceous (Campanian)

Surficial units that cap the formations in several locations include nonmarine terrace deposits, alluvium, colluvium, and landslide deposits. Several landslide areas occur within the OSPN, occurring primarily within the Sespe, the Vaqueros, and the Puente Formations.

Fossils of marine and nonmarine animals and plants have been found throughout the region within the same geologic formations and units within the OSPN. It is very likely that similar resources exist in the OSPN. These resources will be preserved and protected within the OSPN for future scientific and educational studies. Looting and vandalism are a concern with any existing resource. Methods to reduce these risks will include the inventory and periodic monitoring of all known resources, screening vegetation 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 paleontological sites through educational programs and/or active monitoring and stewardship.

Over 50 percent of the OSPN is covered by three soil types. These include: the Calleguas Clay Loam series (37 percent), the Cienebra Sandy Loam series (16 percent), and the Anaheim Clay Loam series (10 percent). The Calleguas and the Cienebra series consist of very shallow to shallow, well-drained soils that form on weathered bedrock on slopes ranging from 9 to 80 percent. The Anaheim series are well-drained, moderately deep soils that form on foothills containing weathered fine-grained sandstone or shale.

Several unnamed inactive faults are located within the immediate region of the OSPN. Most of these were created during uplift of the hills over the last several million years. The faults are generally northwest-trending right-lateral and parallel the Newport/Inglewood Fault Zone to the southwest and the Chino Fault Zone to the northeast. The nearest major active fault is the Chino Fault, located approximately 10 miles to the north. The Newport-Inglewood Fault lies approximately 13 miles to the south. Other active faults that have generated the strongest historical earthquakes nearest to the OSPN include the San Andreas, San Jacinto, and Elsinore Faults and the Elysian Park thrust. Recent geological work suggests that there may be an active fault running roughly parallel to and between the OSPN and Irvine Boulevard, 1 mile to the southwest (Morton and Miller, 2007).

HYDROLOGY

Primary sources of water for the OSPN are rainfall and runoff from surrounding lands. Runoff is not consistent because of low rainfall. Plants and animals in the OSPN have adapted to the xeric conditions. Annual grasslands have a short lifespan, mainly during the winter months. Oak woodlands occur in moist canyons and cool microclimates, where they develop deep roots to access moisture.

Several named canyons cross the OSPN as their creeks flow toward the Tustin Plain. Most trend in a southwesterly direction. They include: Agua Chinon Wash, Round Canyon, Bee Canyon, East Hicks Canyon, Hicks Canyon, and Rattlesnake Canyon. Except where channelized, most creeks do not flow very far from the canyon mouths before going underground, except during periods of rain.

One large reservoir (**Rattlesnake Reservoir**) is located in the vicinity of the OSPN and receives some runoff from the OSPN. Rattlesnake Reservoir is formed by an approximate 70 ft high earth-filled embankment with a concrete lined spillway. It is owned by the Irvine Ranch Water District and is being used to store reclaimed water. It has a capacity of approximately 1,102 acre-feet, or 359 million gallons.

Several retention basins have been constructed within watersheds of the central to southern canyons that cross through the OSPN. They are mainly designed to control the flow of water during rain events and are generally dry during most of the year. They include: Agua Chinon Wash, Round Canyon, Bee Canyon, East Hicks Canyon, and Hicks Canyon.



BIOLOGICAL RESOURCES

This section documents the general biological character of the OSPN in terms of plant communities, wildlife habitats, wildlife movement corridors, and special-interest biological resources, either present or potentially present within the OSPN. The information contained in this section is based on the habitat survey performed by Jones & Stokes Associates, Inc. in 1992 (Jones & Stokes Associates, Inc. 1993), NCCP/HCP target species, identified, conditionally covered species, searches of the California Natural Diversity Data Base (CNDDDB) list of plant communities and species of special interest published by CDFG (2008), and California Native Plant Society (CNPS) inventory of rare and endangered plants 2007.

In 2007, the Santiago Fire burned at least 95 percent of the nonagricultural vegetation communities within the OSPN. Prior to the fire, the OSPN was dominated by CSS, agricultural, and grassland habitats. Riparian, chaparral, and oak woodland habitats were present, but not extensive. It is not known exactly how the vegetation communities of the OSPN will rebound from the fire; however, previous studies of the vegetation communities within the Open Space Preserve–South following the 1993 Laguna Beach Fire (Harmsworth Associates 1996, 1997) indicated 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. CSS and chaparral habitats, although occupying the same general area 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.

Existing Vegetation Types

The distribution of the plant communities and their sub-types present within the OSPN were obtained from the results of a habitat survey performed by Jones & Stokes Associates, Inc. in 1992 (Table B). There are 9 major classifications of plant communities within the OSPN:

- 1) CSS
- 2) Chaparral
- 3) Grassland
- 4) Seasonal Wetlands
- 5) Riparian
- 6) Woodland
- 7) Agriculture
- 8) Developed
- 9) Disturbed

Descriptions of the plant communities and their subtypes present within the OSPN are listed below using the Orange County Habitat Classification System (HCS) articulated by Jones & Stokes Associates, Inc.

Table B: Acreage of Habitat Types within the OSPN

Habitat Type	Acreage
Scrub (2.0 of the HCS)¹	1,724
Sagebrush and Sage Scrub (2.3 of the HCS)	1,564
<i>Undifferentiated Sagebrush and Sage Scrub (2.3.? of the HCS)</i>	6
<i>Sagebrush-Buckwheat Scrub (2.3.1 of the HCS)</i>	52
<i>Black Sage Scrub (2.3.4 of the HCS)</i>	211
<i>Sagebrush Scrub (2.3.6 of the HCS)</i>	3
<i>Buckwheat Scrub (2.3.7 of the HCS)</i>	1
<i>Sagebrush-Black Sage Scrub (2.3.8 of the HCS)</i>	224
<i>Mixed Sage Scrub (2.3.10 of the HCS)</i>	1,061
<i>Bush Mallow Scrub (2.3.11 of the HCS)</i>	6
Southern Cactus Scrub (2.4 of the HCS)	122
Brittlebush-Buckwheat Scrub (2.5 of the HCS)	1
Scalebroom Scrub (2.6 of the HCS)	3
Sage Scrub-Grassland Ecotone (2.8 of the HCS)	34
<i>Undifferentiated Scrub-Grassland Ecotone (2.8.? of the HCS)</i>	6
<i>Sagebrush-Grassland Ecotone (2.8.1 of the HCS)</i>	23
<i>Mixed Sage Scrub-Grassland Ecotone (2.8.5 of the HCS)</i>	5
Chaparral (3.0 of the HCS)	17
Scrub-Chaparral Ecotone (3.1 of the HCS)	1
Toyon-Sumac Chaparral (3.12 of the HCS)	16
Grassland (4.0 of the HCS)	370
Annual Grassland (4.1 of the HCS)	332
Needlegrass Grassland (4.3 of the HCS)	1
Ruderal Grassland (4.6 of the HCS)	27
Sumac Savanna (4.8 of the HCS)	10
Seasonal Wetlands (5.0 of the HCS)	1
Riparian (7.0 of the HCS)	51
Herbaceous Riparian (7.1 of the HCS)	23
Willow Riparian Scrub (7.2 of the HCS)	4
Mulefat Scrub (7.3 of the HCS)	21
Coast Live Oak Riparian Forest (7.5 of the HCS)	1
Black Willow Riparian Forest (7.7 of the HCS)	2
Woodland (8.0 of the HCS)	1
Coast Live Oak Woodland (8.1 of the HCS)	1
Agriculture (14.0 of the HCS)	426
Orchard and Vineyard (14.3 of the HCS)	426
Developed (15.0 of the HCS)	28
Nonurban Commercial/Industrial/Institutional (15.3 of the HCS)	19
Transportation (15.4 of the HCS)	8
Ornamental Landscaping (15.5 of the HCS)	1
Disturbed (16.0 of the HCS)	4
Disturbed or Barren (16.1 of the HCS)	4
Total	2,621

¹ HCS = Orange County Habitat Classification System (Gray and Bramlet 1992)

Scrub (2.0 of the HCS). Scrub vegetation consists of drought-deciduous, low-growing, soft-leaved shrubs and herbs, and is often gray-green. It occupies gentle to steep slopes with shallow soils and occurs most often in shallow or heavy soils at elevations below 3,000 ft. CSS is considered a special-status vegetation type because of its high potential to support Threatened and Endangered wildlife species. There are five “types” of scrub present within the OSPN. Scrub habitats make up 66 percent of the area within the OSPN and are the dominant habitat type. The shrubs that make up scrub are rather short-lived and are adapted to a natural fire regime, possibly with an interval of 40 to 60 years (J. Keeley, pers. comm.), readily sprouting from seed or from the base of the parent plant following such an event. Following a fire, short-lived grasses and forbs are stimulated to grow by a combination of conditions, including fire stimulation, lack of overstory (increasing amount of sunlight reaching the soil), and enriched soil conditions. These short-lived plants provide valuable habitat for animals and enrich the biotic diversity of the OSPN.

Sagebrush and Sage Scrub (2.3 of the HCS). Sagebrush and Sage Scrub is equivalent to the Venturan-Diegan transitional CSS category used by others, although these classifications are not entirely appropriate for the OSPN, as it is a transition zone with a mosaic of types. Within the OSPN it comprises 60 percent of the habitat and is the dominant plant community. It is considered a transitional association that contains elements of two recognized geographical associations of sage scrub, Venturan and Diegan. The OSPN contains seven subassociations of CSS, and most of the scrub falls within this group of subassociations. The CSS subassociations are distinguished by species dominance and physical factors, including aspect, direction, and steepness of slope as well as soil type. A portion of the habitat within the OSPN (less than 1 percent) was surveyed as CSS (2.3 of the HCS) with no subassociation given.

- **Sagebrush-Buckwheat Scrub (2.3.1 of the HCS).** This highly variable subassociation is found on both mesic and drier slopes of the OSPN and makes up 2 percent of the OSPN habitat. It is characterized by a codominance of coastal sagebrush and California buckwheat. Other shrub species in this habitat include white sage, black sage, bush monkey flower, California encelia, coastal deerweed, coastal goldenbush, lemonade berry, giant wild-rye, coyote bush, and lax-flowered bushmallow; and an understory of foothill needlegrass, Pacific fescue, California brome grass, bicolored cudweed, and blue dicks. The understory is often grassy on the more mesic slopes, but may be more open and have less herbaceous cover on the drier slopes.
- **Black Sage Scrub (2.3.4 of the HCS).** This subassociation is dominated by black sage and makes up 8 percent of the OSPN habitat. It is usually found on drier east-facing slopes below 1,000 ft, but may also be located in more mesic situations. Other shrubs associated with this habitat include California buckwheat, coastal sagebrush, lax-flowered bushmallow, coastal prickly pear, chaparral bedstraw, white sage, and our Lord’s candle. The understory is often very open, with mostly litter and duff beneath these shrubs.
- **Sagebrush Scrub (2.3.6 of the HCS).** Sagebrush scrub makes up less than 1 percent of the OSPN habitat, is almost exclusively dominated by coastal sagebrush, and is usually found on mesic slopes. It usually occurs as small patches within grasslands or with other CSS subassociations that support coastal sagebrush as a codominant.
- **Buckwheat Scrub (2.3.7 of the HCS).** Buckwheat scrub makes up less than 1 percent of the OSPN habitat. It is characterized by nearly pure stands of California buckwheat with coastal

sagebrush not present. Other CSS species may occur but in low densities. It occurs throughout the foothills and mountains of Orange County and is most often found on slopes that have been disturbed within the last 10 years.

- **Sagebrush-Black Sage Scrub (2.3.8 of the HCS).** Sagebrush-black sage scrub is dominated by coastal sagebrush and black sage and is usually found on mesic slopes below 1,000 ft. Other shrubs associated with this habitat include California buckwheat, coastal sagebrush, lax-flowered bushmallow, coastal prickly pear, chaparral bedstraw, white sage, and our Lord's candle. Sagebrush-black sage scrub constitutes 9 percent of the OSPN.
- **Mixed Sage Scrub (2.3.10 of the HCS).** Mixed sage scrub makes up 40 percent of the OSPN habitat and is dominated by an even mix of each of four or more CSS species. CSS species that may comprise mixed scrub are California buckwheat, black sage, purple sage, white sage, California encelia, laurel sumac, bush monkey flower, and coastal prickly pear. Coastal sagebrush can occur but is not an important species in this community.
- **Bush Mallow Scrub (2.3.11 of the HCS).** Bush mallow scrub makes up less than 1 percent of the OSPN habitat and occurs on steep to moderate slopes in heavy soils. It is dominated by lax-flowered bushmallow or other mallow species. Black sage often occurs as a codominant; however, other CSS species may be codominants or subdominants.

Southern Cactus Scrub (2.4 of the HCS). Southern cactus scrub contains large stands of coastal prickly pear with at least 20 percent relative cover. Other codominants or subdominants include California encelia, coastal sagebrush, California buckwheat, black sage, and Mexican elderberry. It occurs primarily on south-facing slopes of low foothills. This community differs little in vegetative composition from, and integrates with, sagebrush and sage scrub habitat types. Southern cactus scrub makes up 5 percent of the OSPN habitat and generally exists as small pockets scattered throughout the OSPN; however, there are large concentrations of southern cactus scrub bordering the agricultural lands in the extreme southern portion of the OSPN. This is the preferred habitat type of the San Diego cactus wren.

Brittlebush-Buckwheat Scrub (2.5 of the HCS). Brittlebush-buckwheat scrub (Riversidian CSS) makes up less than 1 percent of the OSPN habitat. It is an inland, high-elevation scrub dominated by brittlebush with California buckwheat, bush monkey flower, and fourwing saltbush as subdominants. Most of this habitat type in the County occurs on south-facing slopes of the Santa Ana River Canyon. In some areas, brittlebush stands may be artifacts of previous revegetation efforts.

Scalebroom Scrub (2.6 of the HCS). Scalebroom scrub (floodplain sage scrub) consists of deep-rooted and upland shrubs that occupy infrequently flooded and scoured habitats such as floodplains and alluvial fans. Scalebroom scrub is dominated by scalebroom. Other species that occupy this habitat are California buckwheat, California brickellbush, mulefat, coastal sagebrush, and laurel sumac. Within the OSPN, scalebroom scrub is primarily found in association with Hicks Canyon Wash and makes up less than 1 percent of the OSPN habitat.

Sage Scrub-Grassland Ecotone (2.8 of the HCS). Sage scrub-grassland ecotone makes up 1 percent of the OSPN habitat and is an open shrub/grassland with 5–20 percent relative shrub cover. A portion of the habitat within the OSPN (less than 1 percent) was surveyed as sage scrub-grassland ecotone (2.8 of the HCS) with no subassociation given. Common shrubs include coastal goldenbush, coastal sagebrush, and California buckwheat. Subshrubs and forbs are a very important component of this habitat type, but nonnative annual grasses often dominate the cover. It occurs in many areas of the County below 1,000 ft. The OSPN contains two subassociations of sage scrub-grassland ecotone.

- **Sagebrush-Grassland Ecotone (2.8.1 of the HCS).** Sagebrush-grassland ecotone makes up 1 percent of the OSPN habitat and is dominated by grass species with coastal sagebrush as the dominant shrub component.
- **Mixed Sage Scrub-Grassland Ecotone (2.8.5 of the HCS).** Mixed sage scrub-grassland ecotone makes up less than 1 percent of the OSPN habitat. It is dominated by grass species, with no one species as the dominant shrub component.



Chaparral (3.0 of the HCS). Chaparral consists of evergreen, dark-green-leaved, medium height to tall shrubs that are adapted to a fire regime of roughly 40 to 60 years (J. Keeley, pers. comm.). As the community grows, it becomes woody and senescent, producing fuel loads which, combined with the oily resins exuded from the plants, create a highly flammable environment. Fires remove aboveground biomass and allow forbs and grasses to regenerate in the fertile ash. Chaparral plants respond to fire by crown sprouting and seed germination. There are two types of chaparral in the OSPN, and they make up 1 percent of the OSPN habitat.

Scrub-Chaparral Ecotone (3.1 of the HCS). Scrub-chaparral ecotone (coastal sage-chaparral scrub) makes up less than 1 percent of the OSPN habitat and represents a gradation and intermingling of CSS types and chaparral types. These represent ecotonal areas between chaparral and scrub communities with component species of both and are usually patches of scrub with a strong component of chaparral species within a chaparral matrix. There are six scrub-chaparral ecotone subassociations described within the HCS. There was no subassociation given for the small amount of area within the OSPN (less than 1 percent) that was mapped as scrub-chaparral.

Toyon-Sumac Chaparral (3.12 of the HCS). Toyon-sumac chaparral makes up 1 percent of the OSPN habitat, is typically found on mesic north-facing slopes, and is dominated by stands of laurel sumac, toyon, and lemonade berry. Other species present include holly-leaved redberry and fuchsia-flowered gooseberry. A sparse understory of CSS species may be present, but it is nearly or completely excluded by the shade of the taller evergreen shrubs.

Grassland (4.0 of the HCS). Historically (pre-European settlement), needlegrass grassland covered as much as 17 percent of California (Keeley 1989), but has been greatly reduced by the invasion of nonnative annual grasses and forbs of Mediterranean origin, changes in the kinds of animals and their grazing patterns, cultivation, and fire (Heady 1977). These nonnative plants, often considered weeds, include grasses such as bromes, wild oats, barley, and herbs such as mustard and thistles. Several animal species, including grasshopper sparrow, white-tailed kite, and American badger utilize grassland habitats. Only 0.1 percent of historic perennial native grasslands in California are extant (Barry 1981). Due to its reduction in range, native grasslands are considered a special-status vegetation type. Four types of grasslands make up 14 percent of the habitat within the OSPN.

Annual Grassland (4.1 of the HCS). Annual grasslands are dominated by annual grasses that are primarily Mediterranean in origin. Dominant species include bromes, wild oats, fescues, and barleys. Many species of native forbs and bulbs, as well as naturalized annual forbs, are found in annual grasslands. Native forbs in these grasslands may include common fiddleneck, miniature lupine, California popcorn flower, California milkweed, common cryptantha, and fascicled tarweed. Annual grasslands occur on gradual slopes with deep soils below 3,000 ft in elevation. Annual grasslands are the predominant grassland within the OSPN and make up 13 percent of the habitat.

Needlegrass Grassland (4.3 of the HCS). As mapped in 1992, needlegrass grassland was identified as making up less than 1 percent of the habitat within the OSPN and is grassland with 10 percent or more cover by purple needlegrass or another needlegrass species. It is associated with San Diego bentgrass, junegrass, fescues, bromes, California blue-eyed grass, blue dicks, mariposa lily, and common golden stars.

Ruderal Grassland (4.6 of the HCS). Ruderal grassland makes up 1 percent of the habitat within the OSPN and consists of early successional grassland dominated by pioneering herbaceous plants that readily colonize disturbed ground. Ruderal grassland is dominated by many grassland species and species of the genera *Centaurea*, *Brassica*, *Malva*, *Salsola*, *Eremocarpus*, *Amaranthus*, and *Atriplex*. Ruderal grassland occurs scattered throughout the County at any site that has been disturbed by either natural or human causes.

Sumac Savanna (4.8 of the HCS). Sumac savanna makes up less than 1 percent of the habitat within the OSPN and consists of annual or needlegrass grassland with widely scattered laurel sumac (5–15 percent canopy cover).



Seasonal Wetlands (5.0 of the HCS). Seasonal wetlands (vernal pools, seeps, and wet meadows) consist of seasonally flooded or saturated sites dominated by nonpersistent and persistent annual and perennial herbs. There are four types of seasonal wetlands listed within the HCS (vernal pool, alkali meadow, freshwater seep, and freshwater swale). The type of seasonal wetland mapped within the OSPN was not specified by the person that mapped the area. Seasonal wetlands make up less than 1 percent of the OSPN habitat.

Riparian (7.0 of the HCS). Riparian habitats consist of trees, shrubs, or herbs that occur along watercourses and bodies of water. The vegetation is adapted to flooding and soil saturation during at least a portion of its growing season. Riparian communities are considered sensitive by CDFG (Holland 1986). In the OSPN there are five types of riparian habitat, which make up 2 percent of the total habitat within the OSPN.

Herbaceous Riparian (7.1 of the HCS). Herbaceous riparian habitat makes up 1 percent of the OSPN habitat and is an early successional stage of riparian scrub and forest. Flooding (or other disturbances) often scours woody riparian vegetation away, and the site is rapidly colonized by pioneer wetland herbaceous plants such as western verbena, California mugwort, sweet clover, cat-tails, sedges, rabbitfoot grass, Bermuda grass, beardless wild-rye, giant wild-rye, coastal salt grass, common plantain, cocklebur, and prickly sow-thistle. Flooding in these areas is frequent.

Willow Riparian Scrub (7.2 of the HCS). Willow riparian scrub makes up less than 1 percent of the OSPN habitat and is dominated by willow species and saplings of riparian forest. Common willow scrub dominants include arroyo willow and narrow-leaved willow with lesser amounts of mulefat and black willow. Weedy species found in this scrub included castor bean, giant reed, tree tobacco, and pampas grass.

Mulefat Scrub (7.3 of the HCS). Mulefat scrub consists of dense stands of mulefat with lesser amounts of willow. It usually occupies intermittent streambeds, seeps, and the toe of landslides (where local seeps develop). Other associated species include Bermuda grass, California mugwort, lamb's quarters, western ragweed, Douglas' nightshade, castor bean, and cocklebur. Mulefat scrub makes up 1 percent of the OSPN habitat.

Coast Live Oak Riparian Forest (7.5 of the HCS). Coast live oak riparian forest is dominated by coast live oaks with western sycamores, Mexican elderberry, and Southern California black walnut present as subdominants. This forest is found in large intermittent drainages and creeks. In narrow drainages it often integrates with oak woodland. Understory shrubs present include laurel sumac, holly-leaved redberry, mulefat, poison oak, fuchsia-flowered gooseberry, lemonade berry, toyon, California scrub oak, and Mexican elderberry. Coast live oak riparian forest makes up less than 1 percent of the habitat within the OSPN.

Black Willow Riparian Forest (7.7 of the HCS). Black willow riparian forest is a multilayered forest with a canopy dominated by black willow with some red willow and arroyo willow. The subcanopy layer contains arroyo willow and mulefat. Coast live oak and western sycamore are occasionally present on the outer margins of this forest. The understory is composed of different associations of species such as hoary nettle, poison oak, California mugwort, and Douglas' nightshade. The habitat develops on floodplains along major rivers and streams. Examples of this community are found along the Santa Ana River, Santiago Creek, and San Juan Creek. Black willow riparian forest makes up less than 1 percent of the OSPN habitat.

Woodland (8.0 of the HCS). Woodland consists of multilayered vegetation with a canopy that is 20–80 percent tree cover.

Coast Live Oak Woodland (8.1 of the HCS). Coast live oak woodland makes up less than 1 percent of the OSPN habitat and is the only woodland habitat found within the OSPN. Coast live oak woodland is dominated by coast live oak with associated shrubs such as California scrub oak, holly-leaved redberry, California coffee berry, toyon, fuchsia-flowered gooseberry, Mexican elderberry, and poison oak. Coast live oak woodland is considered a significant plant community whose canopy forms important habitat for a number of bird species, especially raptors. The oak tree acorns are an important food source for a number of animal species. Among the animal species supported by the oak woodland/forest are mule deer, mountain lion, white-tailed kite, and red-shouldered hawk. Oak woodland is found in the foothills throughout Orange County.

Agriculture (14.0 of the HCS). Agriculture consists of annual crops, vineyards, orchards, dairies, and stockyards. Within the OSPN the only type of agriculture present is orchard and vineyard.

Orchard and Vineyard (14.3 of the HCS). Orchards (primarily avocado) make up 16 percent of the OSPN habitat. In general, orchards and vineyards are scattered throughout bottomland portions of the County and include a variety of fruit and nut trees and vines.

Developed (15.0 of the HCS). Developed sites include urban areas, roads, parks, and cleared or graded sites. There are three types of developed land within the OSPN. Developed land makes up 1 percent of the habitat within the OSPN.

Nonurban Commercial/Industrial/Institutional (15.3 of the HCS). This classification includes scattered commercial/industrial buildings or such institutional facilities as sewage treatment plants outside any existing urban zone. These make up 1 percent of the OSPN.

Transportation (15.4 of the HCS). Transportation consists of freeways and the arterial highway system. It makes up less than 1 percent of the OSPN.

Ornamental Landscaping (15.5 of the HCS). Ornamental landscaping (parks and ornamental plantings) consists of introduced trees, shrubs, flowers, and turf grass. Ornamental landscaping occurs in greenbelts, parks, and horticultural plantings throughout the County. Ornamental landscaping makes up less than 1 percent of the OSPN.

Disturbed (16.0 of the HCS). The only type of disturbed land within the OSPN is disturbed or barren.

Disturbed or Barren (16.1 of the HCS). Disturbed or barren (cleared or graded) areas either lack vegetation or are dominated by a sparse cover of ruderal vegetation, such as tocalote, wild oats, black mustard, prickly sow-thistle, and prickly lettuce. Disturbed or barren land makes up less than 1 percent of the OSPN.



Existing Wildlife Species

The OSPN supports a wide diversity of wildlife species. This diversity is expected, given the relatively large size of the OSPN and its location within a substantial block of natural open space in the foothills of the Santa Ana Mountains. This section describes the wildlife species that may potentially be found within the OSPN.

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 within the OSPN 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. 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 occur in habitat 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.

Some of the native amphibians that may potentially be found within the OSPN include the arboreal salamander, black-bellied slender salamander, Baja California treefrog, western toad, and western spadefoot. The riparian vegetation types present are especially expected to support populations of common amphibian species such as the Baja California treefrog and western toad. Nonnative amphibian species that may potentially be found within the OSPN include the African clawed frog and American bullfrog. Both species are harmful to native amphibian species.



Western spadefoot



Baja California treefrog

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.

Some of the native reptiles that may potentially be found within the OSPN include the western pond turtle, western fence lizard, common side-blotched lizard, coastal western whiptail, orange-throated whiptail, southern alligator lizard, western skink, Blainville's horned lizard, granite spiny lizard, coachwhip, California whipsnake, gopher snake, northern red-diamond rattlesnake, western

rattlesnake, San Bernardino ring-necked snake, common kingsnake, rosy boa, and coast patch-nosed snake.



Blainville's horned lizard



Northern red-diamond rattlesnake

Birds. Birds are the most commonly observed vertebrates within the OSPN, occurring commonly in all of the plant communities. Although many species can be observed in multiple habitat types, the vegetation types present within the OSPN have been organized in the following manner in order to discuss the more common bird species. Some of the bird species potentially present within the OSPN are discussed below according to general habitat preferences. Raptors (birds of prey) use a wide variety of habitats for nesting and foraging and are of particular interest; therefore, these birds are discussed separately here.

Birds of Prey. Raptors (birds of prey) are common in the area. Many forage primarily in grasslands. Some of the raptor species that may potentially occur within the OSPN include red-tailed hawk, American kestrel, Cooper's hawk, sharp-shinned hawk, white-tailed kite, northern harrier, barn owl, great horned owl, and red-shouldered hawk.



Costa's hummingbird



White-tailed kite

Mammals. Some of the small mammal species that potentially occur within the OSPN include the desert cottontail, California ground squirrel, Botta’s pocket gopher, San Diego pocket mouse, western harvest mouse, California mouse, cactus mouse, deer mouse, San Diego desert woodrat, big-eared woodrat, California vole, and introduced house mouse.

Bats occur throughout most of Southern California and may use any portion of the OSPN as foraging habitat. Riparian and woodland vegetation provides potential roosting opportunities for several bat species. Most of the bats that potentially occur within the OSPN are inactive during the winter months and either hibernate or migrate, depending on the species. Some of the potential inhabitants in the OSPN include the big brown bat, pallid bat, California mastiff bat, Brazilian free-tailed bat, Yuma myotis, western pipistrelle, and hoary bat.

Some of the medium- and large-sized mammals that may occur within the OSPN include the Virginia opossum (nonnative), striped skunk, raccoon, coyote, bobcat, mule deer, mountain lion, and gray fox.



Bobcat



Gray fox

Existing Plants Species

Coastal Sage Scrub. CSS vegetation within the OSPN 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 within the OSPN, species diversity is low to moderate, depending on the season. A relatively high number of birds breeding in CSS habitat are permanent residents. Some of the bird species that are typically found in CSS habitat and may potentially be found within the OSPN include the California quail, coastal California gnatcatcher, greater roadrunner, Bewick’s wren, wrentit, California towhee, spotted towhee, San Diego cactus wren, Southern California rufous-crowned sparrow, white-crowned sparrow, Lincoln’s sparrow, hermit thrush, and Costa’s hummingbird.

Agricultural Habitats. Agricultural habitats often support large numbers of a few species and provide excellent foraging habitat for a variety of raptors. Some of the bird species that may occupy this habitat within the OSPN include the rock pigeon (nonnative), California horned lark, European starling (nonnative), western meadowlark, Brewer’s blackbird, mourning dove, American pipit, red-winged blackbird, white-crowned sparrow, and house finch.

Chaparral. Chaparral provides habitat for many resident and wintering species. Some of the bird species that may potentially occur within the chaparral habitats of the OSPN include Anna's hummingbird, western scrub-jay, Bewick's wren, wren-tit, California thrasher, orange-crowned warbler, spotted towhee, ruby-crowned kinglet, hermit thrush, yellow-rumped warbler, and fox sparrow.

Grasslands. Some of the bird species that potentially occur within the grasslands of the OSPN include the killdeer, Say's phoebe, western kingbird, California horned lark, loggerhead shrike, lark sparrow, grasshopper sparrow, western meadowlark, American pipit, savannah sparrow, and European starling (nonnative).

Riparian Woodland. The riparian woodland communities within the OSPN provide important habitat for a wide variety of birds, including nesting trees for species that forage in a variety of habitats. Some of the bird species that may potentially occur within the OSPN include the common yellowthroat, blue grosbeak, California towhee, song sparrow, house finch, lesser goldfinch, Anna's hummingbird, Bullock's oriole, brown-headed cowbird, black-chinned hummingbird, Nuttall's woodpecker, ash-throated flycatcher, common raven, house wren, black-headed grosbeak, western wood-pewee, and California yellow warbler.

Wildlife Movement/Habitat Connectivity

Wildlife movement activities usually fall into one of three categories: (1) dispersal; (2) seasonal migration; and (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 "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. The Hicks Canyon Haul Road undercrossing at SR-241 provides a valuable connection for large mammals (e.g., mountain lion, mule deer, and coyote) between the open space areas to the east of SR-241 (i.e., Limestone Canyon, Whiting Ranch, and beyond) and portions of the OSPN to the west of SR-241 (United States Geological Survey [USGS] 2006).

Wildlife corridors link together areas of suitable wildlife habitat that are otherwise separated by physical barriers, 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 barriers 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:

- Allowing animals to move between remaining habitats, which allows depleted populations to be replenished and promotes genetic exchange;
- 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
- 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).

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 periods 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 (manmade 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.

There is one wildlife corridor associated with the OSPN (City of Irvine 2003) located in the southeastern portion of the OSPN. The Orange County Great Park wildlife corridor is intended to provide connection between LCOS to open space areas in the south (i.e., the OSPS, Laguna Coast Wilderness Park) for medium-sized mammals (i.e., coyote and bobcat). A small portion of the OSPN (located in Parcel R near Portola Parkway) will be a part of this corridor. When completed, the wildlife corridor will run southwest from Agua Chinon Creek in LCOS and the OSPN, under SR-241, through the El Toro National Wildlife Refuge, through the Orange County Great Park, under Interstate 5, and into the open space areas in the south (i.e., the OSPS and Laguna Coast Wilderness Park).

Special-Status and Special-Interest Biological Resources

The following section addresses special-status and special-interest biological resources observed, reported, or having the potential to occur within the OSPN. 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 species that are of special interest to federal and State resource agencies as well as private conservation organizations. In general, the principal 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 and Special-Interest Biological Resources. Special-status wildlife and plant species are those that are listed as or proposed for listing as threatened or endangered by either federal or State resource agencies as well as State fully protected species. Special-interest species are those species that are designated by either federal or State agencies as something other than endangered, threatened, or fully protected (e.g., species of special concern, special animal), or by private conservation organizations (e.g., CNPS). 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 resource agencies.

A **federal Endangered species** is a special-status species and one facing extinction throughout all or a significant portion of its geographic range. A **federal 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 listed 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 special-status species that are officially proposed by the 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 project.

Federal species of concern are special-interest 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 interest 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. The Rare species status applies to California native plants. State Threatened and Endangered species are special-status species and are protected against take.

California Species of Special Concern is an informal designation used by the 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 interest by the CDFG.

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

The **CNPS** is a local resource conservation organization that has developed an inventory of California's special-status and special-interest plant species (CNPS 1999). Species presented within the inventory may be special-status or special-interest species depending on their State or federal designation. 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 1A** 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. **List 4** plant species are not discussed within this document.

Special-status Vegetation Types. The CNDDDB 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 site are described in more detail below.

- **Riparian Vegetation.** The riparian vegetation within the OSPN generally occurs near Rattlesnake Reservoir or 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 United States Army Corps of Engineers (Corps) and CDFG may take jurisdiction over these areas. Due to the reduction of riparian habitat throughout Southern California, this is considered a special-status vegetation type.
- **Streambeds.** The OSPN 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 potentially occur along the drainage courses of the OSPN, including western spadefoot toads and Cooper’s hawks. San Diego cactus wrens and coastal California gnatcatchers use streambeds that contain upland scrub, with gnatcatchers also occurring in some of the 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 Corps and CDFG is required to determine the acreage of any affected jurisdictional areas.

- **Coastal Sage Scrub.** CSS is located throughout the undeveloped portions of the foothills of Southern California. This vegetation type occurs within the OSPN in the form of sagebrush and sage scrub, southern cactus scrub, brittlebush-buckwheat scrub, scalebroom scrub, sage scrub grassland ecotone, and scrub-chaparral ecotone.

CSS is considered a special-status vegetation type because of its high potential to support Threatened and Endangered wildlife species. All three of the “target species” of the NCCP program (coastal California gnatcatcher, orange-throated whiptail, and San Diego cactus wren) are known to occur in CSS within the OSPN.

- **Native Grassland.** In its pristine condition in Southern California, native grassland was dominated by purple needlegrass (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 nonnative 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 are extant (Barry 1981). Due to its reduction in range, native grassland is considered a special-status vegetation type.
- **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 a significant natural resource, and this RRMP 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 CDFG Code Section and United States Clean Water Act Section 404, respectively.

The 2007 Santiago Fire likely affected the distribution and abundance of special-interest plant and wildlife species within the OSPN. Many special-interest plant species, including several mariposa lily species, bloom more profusely after fires. Fires offer a good opportunity to determine the extent of special-interest plant populations in the burn area. In addition, the Santiago Fire, which burned thousands of acres of wildlife habitat within the OSPN and within surrounding open space lands, likely displaced many of the wildlife species that were known to occur within the burn area. As the vegetation communities recover from the fire, it is likely that wildlife species, including special-interest wildlife species, will repopulate the burn areas.

Special-Status and Special-Interest Plants. Two special-interest plant species have been documented within the OSPN (Table C). A number of additional special-status and special-interest plant species have the potential to occur within the OSPN but have not been detected to date (Table D). Tables C and D provide a brief description of the known habitat associated with each species, distribution of each species within California, activity period for each species, and known location within the OSPN (Table C) or the probability that the species may occur within the OSPN (Table D).



Many-stemmed dudleya



Intermediate mariposa lily

Special-Status and Special-Interest Wildlife. Special-interest wildlife species are those animals occurring or potentially occurring within the OSPN that are rare or endangered; are of current local, regional, or State concern; or those target, identified, or conditionally covered species listed in Chapter 2 of the Central and Coastal NCCP/HCP.

Due to its size and diverse physical structures and plant communities, the OSPN supports a diverse fauna. Four special-status and four special-interest wildlife species are known to occur within the OSPN are presented in Table E. In addition, a number of other special-status and special-interest wildlife species may occur within the OSPN (presented in Table F).

Table C: Special Interest Plant Species Known to Occur within the OSPN

Species/ Common Name	Designation	Habitat and Distribution in California	Activity Period	Occurrence Location
Intermediate mariposa lily (<i>Calochortus weedii</i> var. <i>intermedius</i>)	CNPS: 1B NCCP: Conditionally Covered Species	Rocky areas in hills with annual grassland and CSS, 600–2,800 ft elevation; Los Angeles, Orange, and Riverside Counties	Blooms in June through July, with foliage April through July	Known to occur throughout the OSPN along ridgelines in CSS and chaparral
Many-stemmed dudleya (<i>Dudleya multicaulis</i>)	CNPS: 1B	In heavy, clayey soils within chaparral, CSS, and grasslands, 0–2,600 ft elevation; Los Angeles, Orange, Riverside, San Diego, and San Bernardino Counties	Blooms in May through June, with foliage April through July	Known to occur within the OSPN within grasslands and CSS

Table D: Special-Status and Special-Interest Plant Species That May Occur within the OSPN

Species/ Common Name	Designation	Habitat and Distribution in California	Activity Period	Occurrence Probability
Chaparral sand-verbena <i>Abronia villosa</i> var. <i>aurita</i>	CNPS: 1B	Annual herb associated with sandy soils; found in chaparral, CSS, and desert dune habitats from 200 to 5,000 ft in elevation; known from Los Angeles, Orange, Riverside, San Bernardino, San Diego, Imperial, and Ventura Counties; Arizona, and Baja California	Blooms January through September	Low. Considered extirpated in Orange County
Braunton's milk-vetch <i>Astragalus brauntonii</i>)	US: FE CNPS: 1B	Perennial herb considered a limestone endemic and dependent on fire; typically associated with the fire-dependent chaparral habitat on limestone and on down-wash sites; elevation is below 3,000 ft; Los Angeles, Orange, and Ventura Counties	Blooms March through July	Low. Marginally suitable substrate or growing conditions; known from Coal Canyon area
Coulter's saltbush <i>Atriplex coulteri</i>)	CNPS: 1B	Perennial herb of alkaline or clay soils in ocean bluffs and ridgetops and alkaline low places in coastal bluff scrub, coastal dunes, CSS, and valley and foothill grasslands below 1,500 ft elevation; known only from Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, and San Diego Counties	March through October	Low. Marginally suitable substrate or growing conditions
Malibu baccharis <i>Baccharis malibuensis</i>)	CNPS: 1B	Perennial subshrub in Conejo volcanic substrates, often on exposed road cuts within CSS, chaparral, and cismontane woodland; known from Santa Monica Mountains and Simi Hills	Late summer to fall	Low. In 2000 there was a reported sighting in Fremont Canyon; only known occurrence in Orange County
Thread-leaved brodiaea <i>Brodiaea filifolia</i>)	US: FT CA: SE CNPS: 1B	Clay, loamy sand, or alkaline soils; open grasslands at edges of vernal pools or floodplains; below 4,000 ft elevation; Los Angeles, Orange, Riverside, and San Diego Counties; known from about 20 locations	April through June	Low. Marginally suitable substrate or growing conditions

Table D: Special-Status and Special-Interest Plant Species That May Occur within the OSPN

Species/ Common Name	Designation	Habitat and Distribution in California	Activity Period	Occurrence Probability
Tecate cypress (<i>Callitropsis forbesii</i>)	CNPS: 1B NCCP: Identified Species	Evergreen tree found in closed-cone coniferous forest and chaparral at elevations from 800–4,900 ft; known from Orange and San Diego Counties; fewer than five occurrences; trees known from Riverside County are planted	With foliage year-round	Low. Suitable substrate or growing conditions marginally present; known to occur to the northeast in Coal, Gypsum, and Fremont Canyons
Southern tarplant (<i>Centromadia parryi</i> ssp. <i>australis</i>)	CNPS: 1B	Margins of marshes and swamps, vernal pools; often in disturbed sites near the coast, also in alkaline soils with saltgrass; below 1,500 ft elevation	May through November	Moderately Low. Marginal substrate or growing conditions
Long-spined spineflower (<i>Chorizanthe polygonoides</i> var. <i>longispina</i>)	CNPS: 1B	Annual herb of clay soils in chaparral, CSS, meadows and seeps, valley and foothill grassland at 100–4,800 ft elevation; occurs in Orange, Riverside, and San Diego Counties	April through July	Low. Suitable substrate or growing conditions limited; closest known population from Coal Canyon
Santa Monica Mountains dudleya (<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>)	US: FT CNPS: 1B NCCP: Identified Species	Perennial herb of cracks and crevices of rock outcrops and cliff faces in canyons (primarily on north-facing slopes) in chaparral and CSS at 500–5500 ft elevation; known only from Los Angeles and Orange Counties	March through June	Low. Suitable substrate or growing conditions not present
Vernal barley (<i>Hordeum intercedens</i>)	CNPS: 3	Annual herb found in coastal dunes, CSS, valley and foothill grassland (saline flats and depressions) and vernal pools in Los Angeles, Orange, Riverside, Santa Barbara, San Diego, and Ventura Counties; found at elevations of 20–3,300 ft.	March through June	Low-Moderate. Suitable substrate or growing conditions generally not present

Table D: Special-Status and Special-Interest Plant Species That May Occur within the OSPN

Species/ Common Name	Designation	Habitat and Distribution in California	Activity Period	Occurrence Probability
Heart-leaved pitcher sage (<i>Lepechinia cardiophylla</i>)	CNPS: 1B NCCP: Identified Species	Closed cone coniferous forest, chaparral, cismontane woodland; 1,800–4,500 ft elevation; Santa Ana Mountains in Riverside and Orange Counties; also reported from San Diego County and Baja California	April through July	Low. Suitable substrate or growing conditions not present
Robinson’s peppergrass <i>Lepidium virginicum</i> var. <i>robinsonii</i>	CNPS: 1B	Annual herb found in chaparral and CSS habitats from sea level to 2,500 ft in elevation; known from Los Angeles, Orange, Riverside, Santa Barbara, San Bernardino, and San Diego Counties; Santa Cruz Island, and Baja California	Blooms January through July	Moderate. Suitable growing conditions present within the OSPN
Mud nama (<i>Nama stenocarpum</i>)	CNPS: 2	Annual or perennial herb of lake shores, riverbanks, and similar intermittently wet areas at 20–1,600 ft elevation; known in California from San Diego, Imperial, Los Angeles, Orange, and Riverside Counties; and San Clemente Island	January through July	Moderate. Known from Lambert Reserve; could occur along muddy margins or reservoirs/retention basins and streams in the OSPN
Chaparral bear-grass (<i>Nolina cismontana</i>)	CNPS: 1B	Evergreen shrub found in chaparral, CSS, sandstone or gabbro; 500–4,200 ft elevation; Los Angeles, Orange, San Diego, and Ventura Counties	Blooms in May through July, with foliage year-round	Moderately High. Suitable substrate or growing conditions marginally present; known to occur within Limestone Canyon; may be previously unidentified individuals in Loma Ridge area

Table D: Special-Status and Special-Interest Plant Species That May Occur within the OSPN

Species/ Common Name	Designation	Habitat and Distribution in California	Activity Period	Occurrence Probability
Rayless ragwort (<i>Senecio aphanactis</i>)	CNPS: 2	Annual herb of drying alkaline flats in cismontane woodland, CSS, and chaparral at 50–1,900 (2,600?) ft elevation; known in California from Alameda, Contra Costa, Fresno, Los Angeles, Merced, Orange, Riverside, Santa Barbara, Santa Clara, San Diego, San Luis Obispo, Solano, and Ventura Counties	Blooms January through April	Low. Suitable substrate or growing conditions in the OSPN not present
San Bernardino aster (<i>Symphyotrichum defoliatum</i>)	CNPS: 1B	Perennial herb of vernal mesic sites (such as ditches, streams, and springs) in many plant communities below 6,700 ft elevation; in California, known from Ventura, Kern, San Bernardino, Los Angeles, Orange, Riverside, and San Diego Counties	Blooms July through November	Low. Thought to be extirpated, but was probably known from Anaheim Marsh in early 1930s (CNDDB)

Table E: Special-Status and Special-Interest Wildlife Species Known to Occur within the OSPN

Scientific Name	Common Name	Designation	Associated Habitat	Known Location within the OSPN
Amphibians				
<i>Spea hammondi</i>	Western spadefoot	State: Special Concern NCCP: Identified Species	Primarily found in grassland habitats; requires pools for breeding	Reported east of Rattlesnake Reservoir and within Hicks Canyon
Reptiles				
<i>Aspidoscelis hyperythra</i>	Orange-throated whiptail	State: Special Concern NCCP: Target Species	Low-elevation CSS, chaparral and woodlands; sandy areas with rocks and perennial brush	Reported east of Rattlesnake Reservoir and east of SR-241 in the south
<i>Crotalus ruber ruber</i>	Northern red-diamond rattlesnake	State: Special Concern NCCP: Identified Species	In rocky or densely vegetated areas of CSS, chaparral, woodland, and grasslands	Reported east of Rattlesnake Reservoir
<i>Diadophis punctatus modestus</i>	San Bernardino ring-necked snake	State: Special Animal NCCP: Identified Species	Woodland, grassland, chaparral, or scrub habitats; prefer moist habitats; seldom seen in open; often found under rocks, logs, and other debris	Reported east of Rattlesnake Reservoir
Birds				
<i>Campylorhynchus brunneicapillus sandiegensis</i>	San Diego cactus wren	State: Special Concern NCCP: Target Species	Coastal Southern California CSS; requires tall stands of <i>Opuntia</i> cactus for nesting and roosting	Reported throughout much of the OSPN
<i>Polioptila californica californica</i>	Coastal California gnatcatcher	US: Threatened State: Special Concern NCCP: Target Species	CSS below 2,500 ft in Southern California	Reported throughout much of the OSPN
<i>Vireo bellii pusilus</i>	Least Bell's vireo (nesting)	US: Endangered State: Endangered NCCP: Conditionally Covered Species	Utilizes large patches of willow scrub and mulefat scrub habitat for nesting	Reported east of Rattlesnake Reservoir
Mammals				
<i>Puma concolor</i>	Mountain lion	None	Found in many habitats; requires large contiguous areas of native habitat	Reported throughout much of the OSPN

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
Invertebrates			
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	US: Threatened	Grasslands and ponded areas such as vernal pools, cattle watering holes, basins, etc; in southern California, found primarily in the interior of western Riverside County, central Santa Barbara County, and eastern Orange County; also, more recently discovered in Los Angeles County; habitat is generally lacking in OSPN; the likelihood of this species occurring within the OSPN is low
<i>Branchinecta sandiegoensis</i>	San Diego fairy shrimp	US: Endangered NCCP: Conditionally Covered Species	Vernal pools having a restricted permeability subsurface claypan; mesas of San Diego and Orange Counties; closest known population found in the southeastern portion of Weir Canyon; the likelihood of this species occurring within the OSPN is low
<i>Euphydryas editha quino</i>	Quino checkerspot butterfly	US: Endangered NCCP: Conditionally Covered Species	Grasslands and open scrub; requires California plantain or purple owl's clover as food sources; believed to be extinct in Orange County, and the potential for satellite populations to colonize the OSPN is low
<i>Streptocephalus woottoni</i>	Riverside fairy shrimp	US: Endangered NCCP: Conditionally Covered Species	Vernal pools having a restricted permeability subsurface hardpan, claypan or rock; known from San Diego, Orange, and Riverside Counties; likelihood of this species occurring within the OSPN is moderately low
Amphibians			
<i>Anaxyrus californica</i>	Arroyo toad	US: Endangered State: Special Concern NCCP: Conditionally Covered Species	Associated with semiarid regions near washes or intermittent streams; require gravel and/or sand-bottomed overflow pools adjacent to the inflow channel of third order or greater level streams for breeding; last reported in 1974 in Santiago Creek; the likelihood of this species occurring within the OSPN is low
<i>Taricha torosa</i>	California newt	State: Special Concern	Lives in terrestrial habitats and will migrate over 1 kilometer (km) to breed in ponds, reservoirs, and slow-moving streams; the likelihood of this species occurring within the OSPN is low

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
Reptiles			
<i>Actinemys mamorata</i>	Western pond turtle	State: Special Concern	Inhabits permanent or nearly permanent bodies of water in many habitat types and requires basking sites such as partially submerged logs, vegetation mats, or open mud banks; wanders well away from water sources; the likelihood of this species occurring within the OSPN is moderate
<i>Anniella pulchra pulchra</i>	Silvery legless lizard	State: Special Concern	Central California to northern Baja California; frequents loose soil and humus of relatively open habitats; susceptible to drying and live only where they can reach damp soil; the likelihood of this species occurring within the OSPN is moderately low
<i>Aspidoscelis tigris stejnegeri</i>	Coastal western whiptail	State: Special Animal NCCP: Identified Species	Semiarid areas with sparse vegetation on sandy or rocky soil; the likelihood of this species occurring within the OSPN is high
<i>Plestiodon skiltonianus interparietalis</i>	Coronado skink	State: Special Concern NCCP: Identified Species	Mesic areas of grasslands, CSS, chaparral, and woodlands; utilizes rocks, rotting logs, and leaf litter for cover; the distribution of this subspecies is under dispute; the likelihood of this species occurring within the OSPN is very low
<i>Lichanura trivirgata</i>	Rosy boa	State: Special Animal NCCP: Identified Species	Inhabits desert and chaparral from the coast to the Mojave and Colorado deserts; the likelihood of this species occurring within the OSPN is moderately low
<i>Phrynosoma blainvillii</i>	Blainville's horned lizard	State: Special Concern NCCP: Identified Species	Friable rocky or shallow sandy soils of CSS and chaparral; the likelihood of this species occurring within the OSPN is moderately high
<i>Salvadora hexalepis virgulata</i>	Coast patch-nosed snake	State: Special Concern	Brushy or shrubby vegetation with small mammal burrows for refuge; this species was last reported at the FRB Landfill in 2006; the likelihood of this species occurring within the OSPN is moderately high

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
<i>Thamnophis hammondi</i>	Two-striped garter snake	State: Special Concern	Highly aquatic and only occurs in or near permanent sources of water; the likelihood of this species occurring within the OSPN is low , but Rattlesnake Reservoir does provide potential adjacent habitat
Birds			
<i>Accipiter cooperii</i>	Cooper's hawk (nesting)	State: Special Animal	Uses wooded habitat for nesting; foraging occurs over a much wider range of habitats; the likelihood of this species utilizing the OSPN as foraging habitat is high and for nesting habitat moderately high
<i>Aimophila ruficeps canescens</i>	Southern California rufous-crowned sparrow	State: Special Animal NCCP: Identified Species	Grass covered hillsides within CSS and chaparral habitats; nests on the ground; the likelihood of this species occurring within the OSPN is high
<i>Amphispiza belli belli</i>	Bell's sage sparrow (nesting)	State: Special Animal	Chaparral and CSS from west-central California to northwestern Baja California; suitable habitat is fragmented and patchy in the project area; the likelihood of this species occurring within the OSPN is moderately high
<i>Asio otus</i>	Long-eared owl (nesting)	State: Special Concern	Nests primarily in riparian woodlands and requires adjacent habitat with mice and old nests of American crows or hawks for breeding; last reported in Weir Canyon in 1974; likelihood of this species occurring within the OSPN is moderate
<i>Aquila chrysaetos</i>	Golden eagle (nesting and wintering)	State: Fully Protected NCCP: Conditionally Covered Species	Inhabits rolling foothills and mountains areas; nests in cliff-walled canyons; the likelihood of this species occurring within OSPN is moderately low
<i>Athene cunicularia</i>	Burrowing owl (burrows)	State: Special Concern	Inhabits grassland or other open areas that have an abundance of ground squirrel holes, its preferred nesting site; although there is habitat to support the burrowing owl, the likelihood of this species occurring within the OSPN is low
<i>Baeolophus inornatus</i>	Oak titmouse (nesting)	State: Special Animal	Inhabits oak woodland habitat; low amount of suitable habitat present within the OSPN, the likelihood of this species nesting within the OSPN is moderately low

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
<i>Buteo regalis</i>	Ferruginous hawk (wintering)	State: Special Animal	Grasslands provide foraging habitat; formerly known to occur at the El Toro Marine Corps Air Station (MCAS); although there is suitable habitat within the OSPN, the likelihood of this species occurring is moderately low
<i>Calypte costae</i>	Costa's hummingbird (nesting)	State: Special Animal	Forages within CSS habitat; nests within shrubs; the likelihood of this species nesting within the OSPN is moderately high
<i>Carduelis lawrencei</i>	Lawrence's goldfinch (nesting)	State: Special Animal	Occupies oak woodland, chaparral, riparian woodland, and other habitats in arid regions, but usually near water; marginal habitat within the OSPN; the likelihood of this species occurring is low
<i>Chondestes grammacus</i>	Lark sparrow (nesting)	State: Special Animal	Open habitats with scattered brush or trees; the likelihood of this species occurring is moderate
<i>Circus cyaneus</i>	Northern harrier (nesting)	State: Special Concern NCCP: Identified Species	Forages over a wide range of open habitats; nests on the ground or within shrubs; the likelihood of this species utilizing the OSPN as foraging habitat is moderately high and for nesting habitat moderately low
<i>Dendroica petechia brewsteri</i>	Yellow warbler (nesting)	State: Special Concern	Inhabits riparian woodland habitat dominated by cottonwoods, alders, and willows; small amount of suitable habitat within the OSPN; the likelihood of this species nesting within the OSPN is moderately low
<i>Elanus leucurus</i>	White-tailed kite (nesting)	State: Fully Protected	Forages primarily in and around grassy fields and nests in well-developed riparian woodlands located near suitable hunting grounds; the likelihood of this species utilizing the OSPN as foraging habitat is moderately high and for nesting habitat moderately low
<i>Empidonax traillii extimus</i>	Southwestern willow flycatcher (nesting)	US: Endangered State: Endangered NCCP: Conditionally Covered Species	Nests in dense growths of willows and mulefat within riparian habitats, usually with surface water present nearby; the likelihood of this species utilizing the OSPN as foraging habitat or for nesting habitat is very low

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
<i>Eremophila alpestris actia</i>	California horned lark	State: Special Animal	Resides and nests in grasslands; the likelihood of this species occurring within the OSPN is high
<i>Falco columbarius</i>	Merlin (wintering)	State: Special Animal	Open country; breeds in the Holarctic and winters south to the Tropics; the likelihood of this species occurring within the OSPN is high
<i>Falco peregrinus anatum</i>	American peregrine falcon (nesting)	State: Endangered, Fully Protected	Widespread, but scarce and local throughout North America; nests on buildings and bridges in the Los Angeles Basin; the likelihood of this species occurring within the OSPN is moderately low
<i>Icteria virens</i>	Yellow-breasted chat (nesting)	State: Special Concern	Summer resident that inhabits riparian thickets of willow and other brushy tangles near watercourses; potential habitat does exist for this species near Rattlesnake Reservoir and in Hicks Canyon, and the likelihood of this species occurring within the OSPN is moderate
<i>Lanius ludovicianus</i>	Loggerhead shrike (nesting)	State: Special Concern	Open country in much of North America; habitat is suitable but the species is now very rare in the region; the likelihood of this species occurring within the OSPN is moderately low
<i>Pandion haliaetus</i>	Osprey (nesting)	State: Special Animal	Few nesting pairs known to occur in Orange County; habitat adjacent to Rattlesnake Reservoir may be suitable; the likelihood of this species nesting within the OSPN is low
<i>Picoides nuttallii</i>	Nuttall's woodpecker (nesting)	State: Special Animal	Permanent resident of woodland habitat; small amount of suitable habitat present within the OSPN; the likelihood of this species nesting within the OSPN is moderate
<i>Selasphorus sasin</i>	Allen's hummingbird (nesting)	State: Special Animal	Inhabits chaparral and riparian woodland habitats; suitable nesting habitat occurs within the OSPN; the likelihood of this species nesting within the OSPN is moderate

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
Mammals			
<i>Antrozous pallidus</i>	Pallid bat	State: Special Concern	Found in many habitats; roosts in rocky areas and trees that protect them from high temperatures and disturbances; the likelihood of this species utilizing the OSPN as foraging habitat is moderately high and for roosting habitat moderately low
<i>Bassariscus astutus</i>	Ringtail	State: Fully Protected	Occupies woody and rocky areas; marginal habitat present; the likelihood of this species occurring within the OSPN is low
<i>Chaetodipus fallax fallax</i>	Northwestern San Diego pocket mouse	State: Special Concern	CSS, sage scrub-grassland ecotone, and chaparral habitats; sandy, gravelly, or rocky soils; the likelihood of this species occurring within the OSPN is moderately high
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	State: Special Concern	Varied habitats; ranges from southwestern Canada through the western United States to southern Mexico; the likelihood of this species occurring within the OSPN is low
<i>Eumops perotis californicus</i>	California mastiff bat	State: Special Concern	Found in many habitats; roosts in crevices of cliff faces, high buildings, trees, and tunnels; the likelihood of this species utilizing the OSPN as foraging habitat is high and for roosting habitat moderately low
<i>Lasiurus blossevillii</i>	Western red bat	State: Special Animal	Forages over a wide range of habitats, but generally roosts in woodlands and forests; may forage in the general area; the likelihood of this species occurring within the OSPN is moderate
<i>Lasiurus cinereus</i>	Hoary bat	State: Special Animal	Forages over a wide range of habitats, but generally roosts in woodlands and forests; may forage in the general area; the likelihood of this species occurring within the OSPN is moderate
<i>Lasiurus xanthinus</i>	Western yellow bat	State: Special Animal	Occupies varied habitats, but usually near water; often associated with palm trees; marginal habitat present; the likelihood of this species occurring within the OSPN is low
<i>Lepus californicus bennettii</i>	San Diego black-tailed jackrabbit	State: Special Concern	Open country of coastal Southern California and northern Baja California; the likelihood of this species occurring within the OSPN is moderate

Table F: Special-Status and Special-Interest Wildlife Species That May Occur within the OSPN

Scientific Name	Common Name	Designation	Habitat and Comments
<i>Myotis ciliolabrum</i>	Western small-footed myotis	State: Special Animal	Roosts in cliffs and forages nearby; marginal habitat present; the likelihood of this species occurring within the OSPN is low
<i>Myotis yumanensis</i>	Yuma myotis	State: Special Animal	Occupies varied habitats in western North America; may forage in the general area; the likelihood of this species occurring within the OSPN is moderate
<i>Neotoma lepida intermedia</i>	San Diego desert woodrat	State: Special Concern NCCP: Identified Species	Frequently found in poorly vegetated arid lands and especially associated with cactus patches; the likelihood of this species occurring within the OSPN is high
<i>Nyctinomops femerosaccus</i>	Pocketed free-tailed bat	State: Special Concern	Occupies varied habitats, but usually associated with high cliffs or rocky areas; marginal habitat present; the likelihood of this species occurring within the OSPN is low
<i>Taxidea taxus</i>	American badger	State: Special Concern	Inhabits open areas with friable soils and uncultivated land; although there is sufficient habitat present to support it, the likelihood of this species occurring within OSPN is moderately low

WILDLIFE HABITAT MANAGEMENT

General wildlife management objectives and techniques recommended to be implemented within the OSPN 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 will be updated as part of population surveys. Recommendations for management or enhancement of sensitive plant populations will be developed as needed, and may include recommendations for protective fencing, removal of nonnative species, and the addition of 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 by a qualified professional. Any vegetation removed for trail maintenance should be chipped and used as mulch for on-site habitat creation activities or for covering unauthorized trails.

Snags

Native tree snags (dead tree limbs) and dying native 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.

CULTURAL RESOURCES

The City's OSPN contains a rich historic past. Its resources include information of prehistoric and historic occupation. A diverse human occupation of this land extends as far back as 10,000–12,000 years. Within the OSPN are a number of known sites. Many of the sites are documented as part of California Environmental Quality Act (CEQA) requirements for adjacent development and have been fully mitigated. Other known sites exist that have not been closely examined and could provide important new information. Finally, there are likely sites that have yet to be discovered that also could provide important information on the history and prehistory of the area.

Cultural resources will be preserved and protected within the OSPN. 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, screening vegetation 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.





Recreation & Resource Management Plan

RECREATION AND RESOURCE MANAGEMENT

RECREATION AND RESOURCE MANAGEMENT

REQUIREMENTS OF THE NATURAL COMMUNITY CONSERVATION PLAN (NCCP)

The NCCP/HCP requires the City to prepare and submit an RRMP for review and approval to the CDFG and USFWS. These documents contained herein detail the policies and procedures for managing and monitoring the City's OSPN.

Although 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 is charged with the actual management of the lands owned by the City. Following are the items identified in the NCCP *Implementation Agreement* as Reserve Owner/Manager activities:

- Coordinate management activities with NROC and ensure that such activities are consistent with the annually approved Work Plan.
- Prepare an annual Work Plan for activities for the upcoming year in consultation with NROC.
- Provide an annual Progress Report to NROC on the current year's Work Plan for inclusion in the NROC overall Annual Report submitted to CDFG. The Annual Report 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, and 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 system lands in the Reserve upon transfer by private owners.
- Conduct or allow NROC or other appropriate public or nonprofit agencies to conduct specific adaptive management measures required under the current NROC Work Plan, including:
 - Restoration
 - Enhancement
 - Habitat management
 - Public access/recreational management
 - Reserve system and public 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 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/RRMP (General Development Plan/Recreation/Recreation and Resource Management Plan) policies;
- Provide technical Reserve management expertise; and,
- Provide funding for the above adequate to assure that proposed access/recreation use can be accommodated consistent with the NCCP/HCP policies and the GDPs and Resource Management Plans

At the time the NCCP/HCP Plan was prepared, the County was in a master-planning process for several areas of wilderness lands. At that time, the areas that are now City lands were part of the planning process. As a result, the NCCP/HCP Plan anticipated the County of Orange Environmental Management Agency and Harbors Beaches and Parks, (EMA, HBP [now OC Parks]) as the entity managing these lands. As such, Section 5.8.6 of the recreation policy specifies 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. The facilities depicted on Figure 28 (Limestone Activity Nodes) are both located in the southern portion of the OSPN. One is the Portola Trailhead, and the other is the Round Canyon staging area (described below under “Portola Trailhead”).

Now that the City is the managing entity, and the facilities within the Reserve the City would like to implement are those shown on Figure 28 of the NCCP/HCP plan, the USFWS has determined that as a “Reserve owner manager,” under the definition in the Implementation Agreement, the City shall have the same requirement to prepare an RRMP. This RRMP will address future access uses and facilities of parks located within the Reserve System. The Plan shall be submitted to the CDFG and USFWS for review and approval. Approval of the RRMP by these agencies will provide NROC authorization for the City to move forward with general park operations, phased public access programs, trail development and maintenance, and land management projects.

The City’s OSPN RRMP is 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 subregion.

ADAPTIVE MANAGEMENT

Adaptive management, as defined by the NCCP, “shall mean the flexible, interactive approach to long-term management of biotic resources that is directed over time by the results of ongoing monitoring activities and other information. Under this approach, 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 OSPN. Many of these activities will be conducted by others, including NROC and developers; however, the City will approve and coordinate these activities on City lands in coordination with NROC:

- Management of public access and recreation;
- Monitoring and associated adaptive management of the biological resources located within the OSPN in coordination with NROC;
- Restoration and enhancement actions (other than creation of new CSS habitat) such as eradication of invasive, nonnative plant species, predator control, grazing management plans, and 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 OSPN;
- 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 “nonparticipating 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 OSPN;
- 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;
 - Continued operation of preexisting OSPN facilities, including active recreation facilities or agricultural activities 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;
 - OSPN 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; and

- Existing uses consistent with Section 5.11 of the NCCP/HCP.

CITY OF IRVINE MANAGEMENT GOALS

The City has a long-established history of protecting and preserving large areas of valuable open space. The 1988 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:

- Ensure the preservation and conservation of City open space lands. The City will adhere to the monitoring criteria established by NROC in the Monitoring Plan and will monitor the OSPN through patrols;
- Protect and maintain existing natural resources;
- Provide valuable “wilderness type” passive recreational and educational activities; and
- Restore and/or enhance degraded habitats to improve biological productivity and diversity within the OSPN.

The City is committed to providing a quality public park system that will meet the anticipated needs and demands of the residents. On April 20, 2005, the Community Services Commission approved Park and Public Facility Standards that included Open Space Design Standards. An Open Space Design Standards section of the Park and Public Facility Standards was originally approved by the Community Services Commission on May 7, 2003. The purpose of the City’s Park/Public Facility Standards is to establish park development standards for guidance in acceptance of park land; collection of park fees, or provision of in-lieu improvements; and criteria for design of public and private parks. These Standards are administratively updated and revised periodically as needed. The Standards incorporate information on gates, signage, trail widths, American with Disabilities Act accessible trails, trail and trailhead design, etc.

OPEN SPACE PRESERVE – NORTH 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

The Trails Master Plan Map (Exhibit C) depicts the trail system for the City’s OSPN. Recreational trails are primarily limited to existing trails and truck roads in order to minimize damage to open

Exhibit C: Trails Master Plan Map

space resources. In addition, limited development of new trails will be needed in order to connect open space areas. Connections to Limestone Canyon Open Space and the Orange County Great 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 Areas 1 and 6

The City's OSPN contains both existing truck trails and some double-track trails that were once ranch roads. Some of the truck trails are in good locations and can facilitate recreational use; others will need to be relocated or abandoned, as depicted in the Trails Implementation Plan Map (Exhibit D). Some 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 revegetation to restore them to natural condition.

The trails are designated as “multi-use.” Multi-use trails accommodate hikers, mountain cyclists, and equestrians. On an interim basis, until the City's Gateway Ridge Community Park is built, the Hicks Canyon trail will be a “hiking-only” trail. The trail at Hicks Canyon is too short to offer fulfilling recreation opportunities for equestrians or cyclists, until an additional trail segment is implemented to form a complete loop. Following development of the Gateway Ridge Community Park Trailhead (see “Trailheads” section below), recreational opportunities for equestrians and cyclists, in Limestone Canyon (via Hicks Haul Road), may also develop.

Trail users will be restricted to 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 City's OSPN 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 OSPN access and trail use will afford recreational opportunities compatible with protected natural resources.

OSPN operations and public use may be restricted when necessary to minimize impacts to sensitive habitat, to prevent user conflicts with wildlife (i.e., nesting season), and where degraded site conditions impact user safety. Trail use shall be prohibited on red flag warning days and for appropriate periods following rains to avoid trail damage and impacts on adjacent habitat. A “red flag warning” is issued by the United States National Weather Service to inform firefighting and land management agencies that conditions are ideal for wildland fire ignition and propagation. Trail use will be accessible only during operational hours as determined by the Community Services Department.

Exhibit D: Trails Implementation Plan Map

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

Trailheads

Orchard Hills Trailhead. This public trailhead (Exhibit E) will be located within the PA1 (Orchard Hills) development northeast of the ‘D’ Street and ‘J’ Street intersection (this trailhead will not be located within the NCCP). The trailhead will serve as a public gateway to the northern portion of the OSPN.

The trail at the Orchard Hills Trailhead leads northeast out of the trailhead. It is a “figure 8” shaped, multi-use (hiking, cycling, and equestrian), one-way (counterclockwise), 4-ft wide loop trail. The lower portion of the “figure 8” skirts the outside of the existing avocado orchard. The upper portion of the “figure 8” is within the existing orchard, along the perimeter service road. The trail skirts the orchard and consists of a 4-8 ft wide path that largely travels adjacent to existing eucalyptus wind rows. A cable fence will be placed on the orchard side of the path in order to deter participants from venturing into the avocado orchard. This will minimize vandalism, avocado poaching, and general disruption of orchard operations. Both portions of the “figure 8” will be both docent-led and self-guided trails.

Docent-led tours starting from the trailhead will follow the trail to the upper limit of the upper portion of the “figure 8.” From there the participants will be led northeast through a control gate, out of the OSPN, under SR-241, up to Loma Ridge, and to open space lands adjacent to the OSPN (primarily Limestone Canyon Open Space).

Trailhead amenities include:

- Trail access for mountain bike and pedestrian use
- Parking lot with 3 equestrian stalls, 2 handicap spaces, and 9 vehicle spaces
- Restroom building
- Kiosk/signage
- Drinking fountain
- Picnic tables
- Bike racks
- Trash receptacle
- Benches

Exhibit E: Conceptual Site Plan of Orchard Hills Trailhead

Portola Trailhead. The Portola Trailhead (Exhibit F) is currently located and will continue to be located just to the northeast of SR-241 at the end of Portola Parkway. Docent-led hiking, cycling, and equestrian tours are currently offered from this trailhead. Self-guided tours are not expected to be offered from this trailhead in the future.

There are currently two areas served from the Portola Trailhead. The first is a program leading into Limestone Canyon Open Space. This program utilizes a truck trail that partially lies within the Agua Chinon streambed and leads to Loma Ridge. In the future the portion of this truck trail that lies within the Agua Chinon streambed (outside of the OSPN) may be redesigned if feasible in favor of a new more sustainable 4 ft wide trail that will run along the ridge to the north. It is difficult to maintain the current truck trail within the drainage. The second program currently offered from the Portola Trailhead goes into Round Canyon to the north. The trailhead located at the mouth of Round Canyon serves as a staging area for this tour. The Portola Trailhead and the Round Canyon staging area are both within the NCCP. This double-track trail currently offers an out and back tour that dead ends at the FRB Landfill and does not offer any connection to other trails. In the distant future (after the closure of the landfill), this trail may be extended in order to connect to Loma Ridge. One potential future trail is the proposed route from the Portola Trailhead to the Orange County Great Park. The properties of this trail (trail width, type of use, etc.), if it is developed, will be determined at a later date.

The Portola Trailhead improvements include:

- Docent-led tours
- Parking for 20 plus vehicles
- Restroom building
- Informational kiosk/regulatory, interpretive, and identity signage
- Equestrian water trough
- Picnic tables
- Benches

The Round Canyon staging area improvements include:

- Docent-led tours
- Parking for 10 vehicles on an existing paved area
- Portable toilets (only on site during tours)
- Picnic tables
- Information kiosk/regulatory, interpretive, and directional signage

Exhibit F: Conceptual Site Plan of Portola Trailhead

Gateway Ridge Community Park Trailhead. This Hicks Canyon staging area is currently substituting for the future Gateway Ridge Community Park Trailhead. The Hicks Canyon staging area and the future Gateway Ridge Community Park Trailhead are both outside of the NCCP Reserve. The Hicks Canyon staging area is located on Jeffrey Road approximately 0.33 mile east of Portola Parkway. There is limited parking available at the staging area. The only amenity currently offered at the trailhead is a portable toilet that is only on site during a scheduled tour. Currently the only tour offered from the staging area is an out and back, hiking-only, self-guided tour along a truck trail. Ultimately, this existing staging area will be replaced by the future Gateway Ridge Community Park Trailhead. A multi-use, self-guided loop trail will stage from the future Gateway Ridge Community Park Trailhead. The trail will closely follow the current out and back tour. Another potential tour is a docent-led tour (hiking and cycling) that leads up Hicks Canyon Haul Road to Loma Ridge and into Limestone Canyon Open Space. The Gateway Ridge Community Park Trailhead is planned to be located at the northern end of the proposed 71-acre Gateway Ridge Community Park. The trailhead design will be prepared at a future date. The improvements to this trailhead may include:

- Managed trail access for mountain bike and pedestrian use
- Parking for vehicles
- Restroom building
- Kiosk/signage
- Drinking fountain
- Picnic tables
- Bike racks
- Trash receptacle
- Benches

Note: Due to other uses at this community park, an equestrian staging area will not be located here but will be at the Orchard Hills and Portola Trailheads.

Fencing and Signage

Fencing. Trail fencing should be provided where needed to control trespass, confine users within the trail width, and for safety (such as at steep slope areas, bridges, adjacent orchards, 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's Open Space Trails and Facilities (Appendix H) 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 OSPN rules as well as signs denoting resource features and points of interest. To protect the natural scenic quality of the OSPN, 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 the OSPN. A signage program will be developed separately.

The OSPN will include several types of signs, typical examples are described below:

Entry Monument Signs. Entry monument signs will be located at gateways to the OSPN. These points of access shall include the Orchard Hills, Portola, and future Gateway Ridge Community Park Trailheads as well as the Hicks Canyon (temporary) and Round Canyon staging areas. These signs should designate the entrance to the OSPN 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 and staging area. Kiosk/bulletin board signs should include, at the minimum:

- Information advising trail users of rules and regulations, prohibited activities, trail etiquette, potential hazards including wilderness warning signage and fire danger signage, permitted trail uses, emergency information, and emergency phone numbers
- 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 0.25 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 (e.g., poison oak) and animals
 - Hours of operation
 - Phone number or internet address 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, as needed

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, or to identify trail closures.
- **Trail user yielding signs** should be placed at all trailheads 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 that 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 OSPN areas shall be determined. The carrying capacity will be determined over time, depending on the anticipated type and intensity of use.

If 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 public 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 OSPN involves certain risks as a consequence of the rugged terrain, the unpredictability of the natural environment, and the potential isolation from urban services.

Permitted Uses

The City's OSPN 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, interpretive walks, mountain biking, equestrian use, picnicking, 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.
- Existing agricultural uses.

Accessibility

Accessibility will be determined by the natural contours of the land. Due to the nature of the existing topography, much of the OSPN may not be fully accessible. The City will endeavor to provide as wide a range of accessibility as possible and may include staffed van tours and some trails that may accommodate powered wheelchairs and four-wheel-drive wheelchairs.

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

Prohibited Uses

Except where necessary for the management of the OSPN 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 OSPN for purposes of management, maintenance, accessibility programming, and police and fire services by easement or special permit
- Fires, campfires, camp stoves, and smoking
- Release of domestic or nonnative animals
- Overnight camping
- 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, or results in damage to or destruction of OSPN 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 personal use or sale
- The creation of nonapproved trails
- Littering or dumping of trash and debris or disposal of hazardous waste materials with the OSPN
- Swimming and wading
- Artifact, plant and animal collecting except for approved research and study (access into the OSPN for research and study will be coordinated and monitored through the OSPN 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 the Orchard Hills and Portola trailhead areas and facilities.
 - Dogs on a leash are not permitted on OSPN trails within NCCP boundaries.

Grazing of livestock, including utilization of natural forage for commercial purposes, shall be prohibited unless utilized in conjunction with habitat management practices (e.g., habitat restoration, habitat enhancement, and invasive species removal).

Phased Operation and Access Strategies

The acquisition of open space by the City 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 RRMP is designed to

function at various levels of public access from “Docent Only Access” to occasional supervised “Open Access Days” to managed “Open OSPN Hours,” which could occur from sunrise to sunset, seven days per week.

The phased operational plan consists of the following three elements:

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

Land Management and Administration. As a signatory to the NCCP, the City is required to meet specific mandates for management of the OSPN as a Nature Reserve. This entails coordinating the activities conducted by NROC, 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.

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 consist 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 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. The City’s Public Safety Department will provide assistance with OSPN patrols.

Program Management. The City will provide public access to the OSPN through a multi-mode access program. The access strategies are dependent upon availability of funds and habitat sensitivity. The services will be provided by City staff or contracted out. The three strategies of the access program may consist of the following:

1. Docent-led/staff-led tours
2. Docent-led/staff-led tours and managed open access on weekends (self-guided tours)
3. Docent-led/staff-led tours and managed open access year-round (self-guided tours)

Docent-led/Staff-led Only Access. Under this scenario, the public has access to the OSPN 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 OSPN maintenance staff.

Docent-led/Staff-led Tours and Open Access on Weekends. Under this scenario, the OSPN has more typical open hours on Saturdays and Sundays, when the public can use the OSPN without a

docent. Docent-led and staff-led 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 self-guided tours.

Docent-led/Staff-led Tours and Open Access Year Round. Under this scenario, the OSPN has typical open hours most of the week when the public can use the OSPN. Some docent-led 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 OSPN will meet NCCP guidelines. Recreational uses will include the following:



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 or City-designated contractor’s scheduled programs, or through the open access days as the OSPN 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 or City-designated contractor’s scheduled programs, or through the open access days as the OSPN 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 or City-designated contractor’s scheduled programs, or through the open access days as the OSPN is scheduled for regular operating hours. The Orchard Hills, Portola, and Gateway Ridge Community Park (when completed) Trailheads will serve as equestrian staging areas.

Picnicking. Picnicking opportunities will exist at the following areas:

- Orchard Hills Trailhead

- Gateway Ridge Community Park Trailhead
- Portola Gateway Trailhead

Informal picnicking will be allowed throughout the OSPN. 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 will not be permitted within the OSPN.

Infrastructure

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

Access to the OSPN 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 standards.

Special Access Permits

Special access permits will be issued by the 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 City staff.

Enforcement Procedures

Applicable local, State, and federal laws and/or ordinances pertaining to the protection and use of the OSPN, whether originating at the local, regional, State, 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 OSPN.



Signage shall be used to clearly indicate appropriate behavior in the OSPN. 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 OSPN is a wilderness area and 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 Gateway Ridge Community Park Trailhead and the Orange County Great Park and other open space facilities, trails, and trailheads by the City or the City-designated contractor. 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 day camps, nature walks, adult classes, community presentations, exhibits, signage, educational brochures, trail guides, after-school classes, classroom in the field programs, Kids and Nature program, 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 City homeowner'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 and nonprofit agencies, 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
- The Irvine Ranch Conservancy
- Irvine Ranch Water District
- Sea and Sage Audubon
- The Irvine Museum
- Orange County Wild
- University of California, Irvine
- Homeowner's Associations
- Limestone Canyon Wilderness Park
- Whiting Ranch Wilderness 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 revegetation 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, or the City-designated contractor's agreements, or volunteer procedures, and will complete a comprehensive training program. 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 OSPN's natural resources. By installing an appreciation for the OSPN's ecosystem, it is more likely that future visitors will respect and protect its natural resources. This is the only category of volunteer that may lead guided public access trail programs.

- **Trail Guides** will have opportunities to volunteer in a number of different areas. They could provide staff with program support, assist with program sign-in, and serve as sweeps on hikes and guided tours. Trail guides could also provide visitors with information about trail safety and etiquette and monitor trail use and conditions as they tour the OSPN as well as assist with setup and cleanup.
- **Land Stewards/Trail Bosses** will assist staff with trail maintenance and management, native plantings, cleanup projects, restoration and revegetation projects, and other resource management projects.
- **Collaborative Volunteer Programs.** The City, or City-designated contractor, 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
 - Trails4All
 - The AmeriCorps



RESTORATION, ENHANCEMENT, AND MITIGATION

Much of the OSPN 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 had been recently used for agriculture now support predominantly nonnative vegetation.

A significant amount of the OSPN 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 CSS 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 OSPN, restoration shall mean the transition of habitats containing nonnative plant materials to habitats containing nearly all 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 nonnative materials as well as planting of new materials. Any project other than maintenance will be coordinated with 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 City's Community Services Department. 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 OSPN. Most of Parcels A and B, P, and R have been analyzed for potential mitigation opportunities. These existing areas are shown in Exhibit G. Parcel Q has not been analyzed. 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 Policy, Section 5.6. Restoration and enhancement projects will be identified and reviewed as part of the Annual Work Plan submitted to NROC.

Exhibit G: Potential Mitigation Sites Maps

Exhibit G – Page 2

Exhibit G – Page 3

FEE STRUCTURES AND FUNDING OPPORTUNITIES

Fees for all OSPN activities operated by the City must be reviewed and approved by City Council. Fees may be charged for the following activities: parking, special events, group tours, school tours, guided hikes, and scout hikes.

Donation and Sponsorship Programs

Structured donation programs may be developed and could 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 Work Plan be submitted to the NROC Board of Directors. The City will prepare and submit an Annual Work Plan for the OSPN that ensures that management activities are coordinated with the NCCP Nonprofit Corporation and consistent with the NCCP/HCP.

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 will prepare and submit an Annual Progress Report for the OSPN 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 Nonprofit 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 NROC PLANS

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

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

Per Chapter 5 of the NCCP plan, the City will comply with the above management plans that are included by reference only herein.

APPENDIX A
LIST OF ACRONYMS

APPENDIX A

LIST OF ACRONYMS

CDFG	California Department of Fish and Game
CESA	California Endangered Species Act
City	City of Irvine
CMP	Conceptual Master Plan
CNDDDB	California Natural Diversity Data Base
CNPS	California Native Plant Society
Corps	United States Army Corp of Engineers
County	County of Orange
CSS	Coastal Sage Scrub
EMA	Environmental Management Agency
FESA	Federal Endangered Species Act
FRB Landfill	Frank R. Bowerman Landfill
ft	feet/foot
GDP	General Development Plan
HBP	Harbors Beaches and Parks (now OC Parks)
HCP	Habitat Conservation Plan
HCS	Habitat Classification System
km	kilometer(s)
LCOS	Limestone Canyon Open Space
mi	mile(s)
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
OSPN	Open Space Preserve - North
PA	Planning Area
RRMP	Recreation and Resource Management Plan
SilMod	Silverado and Modjeska Canyons
SR-241	State Route 241
SR-261	State Route 261
TCA	Transportation Corridor Agencies
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

APPENDIX B
ANIMAL AND PLANT SPECIES

APPENDIX C

**FIRE MANAGEMENT PLAN
(TO BE PREPARED BY
THE NATURE RESERVE OF ORANGE COUNTY)**

APPENDIX D

**EXOTIC PLANT CONTROL PLAN
(TO BE PREPARED BY
THE NATURE RESERVE OF ORANGE COUNTY)**

APPENDIX E

**INVASIVE AND PEST SPECIES CONTROL PLAN
(TO BE PREPARED BY
THE NATURE RESERVE OF ORANGE COUNTY)**

APPENDIX F

**RECREATION MONITORING PLAN
(TO BE PREPARED BY
THE NATURE RESERVE OF ORANGE COUNTY)**

APPENDIX G

**HABITAT RESTORATION AND ENHANCEMENT PLAN
(PREPARED AND COMPLETED BY LSA 2003)**

APPENDIX H

DESIGN STANDARDS AND GUIDELINES FOR CITY OF IRVINE'S OPEN SPACE TRAILS AND FACILITIES

APPENDIX I
REFERENCES

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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
Chris Mears
Christina Shea

Community Services Commission

Cathy Garris, Chair
Mitch Goldstone, Vice Chair
Alan Dugard
Jon Fleischman
Mariam Khosravani

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Lana Weiss, Associate Planner



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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Recreation & Resource Management Plan

Introduction

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).

City of Irvine: Open Space Preserve - South
Recreation & Resource Management Plan

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

1991
California Natural
Communities Planning Act
is passed by California
Legislature

1993
Coastal Gnatcatcher is
listed under the Federal
Endangered Species Act

1996
County of Orange creates
1st Application - Central
and Coastal Subregion
NCCP/HCP

1988
City of Irvine residents vote
to preserve open space

1988
City of Irvine and The Irvine
Company sign Open Space
Implementation Agreement
providing for future open
space preservation areas
and development areas

1996
City of Irvine and The Irvine
Company sign NCCP
Facilitation Agreement

1996
The Irvine Company
becomes signatory to
NCCP/HCP Plan and
NCCP/HCP Implementation
Agreement as "participating
landowner"

1996
City becomes signatory to
NCCP/HCP Plan and
NCCP/HCP Implementation
Agreement as future
"Reserve Owner Manager"

2002
City accepts first land
transfers and becomes
"Reserve Owner Manager"

2003
Recreation and Resource
Management Plan "required
prior to establishment of
permanent access, uses or
facilities"

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:

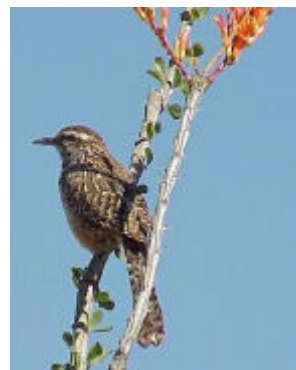
- Planning for the protection of multiple-species and multiple habitats within the coastal sage scrub habitat mosaic by creating a habitat reserve system that contains substantial coastal sage scrub, chaparral, grassland, riparian, oak woodland, cliff and rock, forest and other habitats;
- Developing 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 (*Poliophtila 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

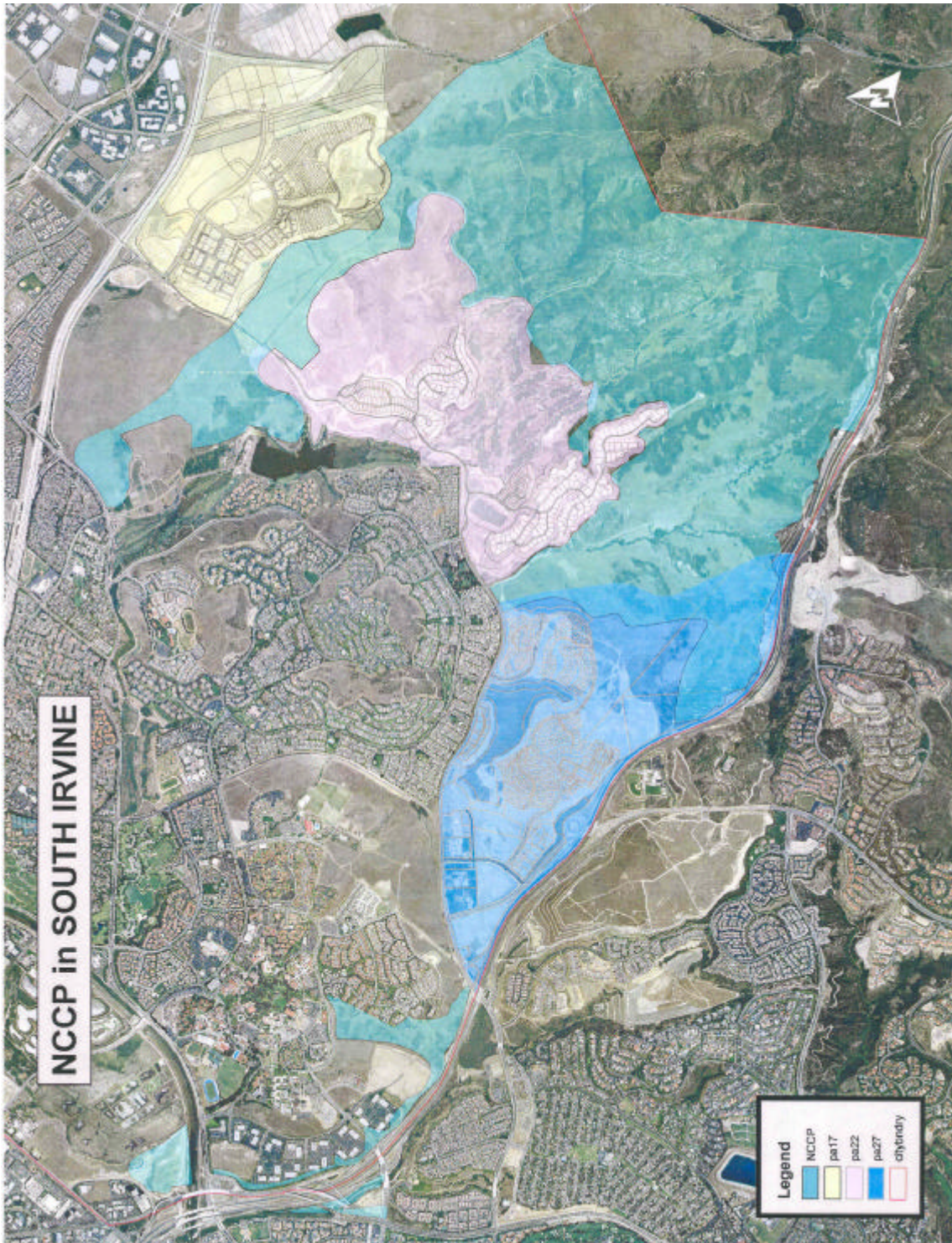
City of Irvine: Open Space Preserve - South
Recreation & Resource Management Plan

- 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-trending 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-foot 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 (*Sambucus 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 (*Asclepias fasciculata*), foxtail fescue (*Vulpia nzyuros*), and Italian ryegrass (*Lolium multiflorum*).

- **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 gatus ssp. guttatus*), African brass-buttons (*Cotula coronopifolia*), smooth umbrella-sedge (*yperus laeWgatus*), needle spike-rush, Olney's bulrush (*Scirpus americanus*), 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 bigelovi*), pine golden bush (*Ephedra pinifolia*), cudweed aster (*Lessingia filaginifolia*), cacti (*Opuntia spp.*), sand mat (*Cardionema ramosissimum*), pigmy stonecrop (*Crassula errecta*), dudleya (*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 Planning 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*), wrenit (*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, wrenit, 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 (*Eptesicus fuscus*), 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*).

- **Butterflies**

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 1A** 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 CNDDDB 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 1B 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 beldingi)

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 and Willick 1996). Since that time there have been very few records of this species in 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. al 1991). During winter months, they are often found foraging in wet pastures, agricultural fields, and seasonal wetlands. Tricolored blackbirds 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 californicus)

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 bennettii)

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

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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

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

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

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

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

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

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

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

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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 fasciculata Fascicled tarweed
Heterotheca grandiflora Telegraph weed
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

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Cliff malacothrix
Picris echioides Bristly ox tongue
Sonchus asper Rough sow-thistle/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 bocconeii 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/lanceolar/ 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

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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-O’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

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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

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Goldenstars
Dichlostemma capitatum Blue dictys
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).

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- 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 public 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 policies 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 revegetation 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.

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Recreation & Resource Management Plan

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 public 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 from 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.

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- 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 consist 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 pits, 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, state, 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 revegetation 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 revegetation 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.

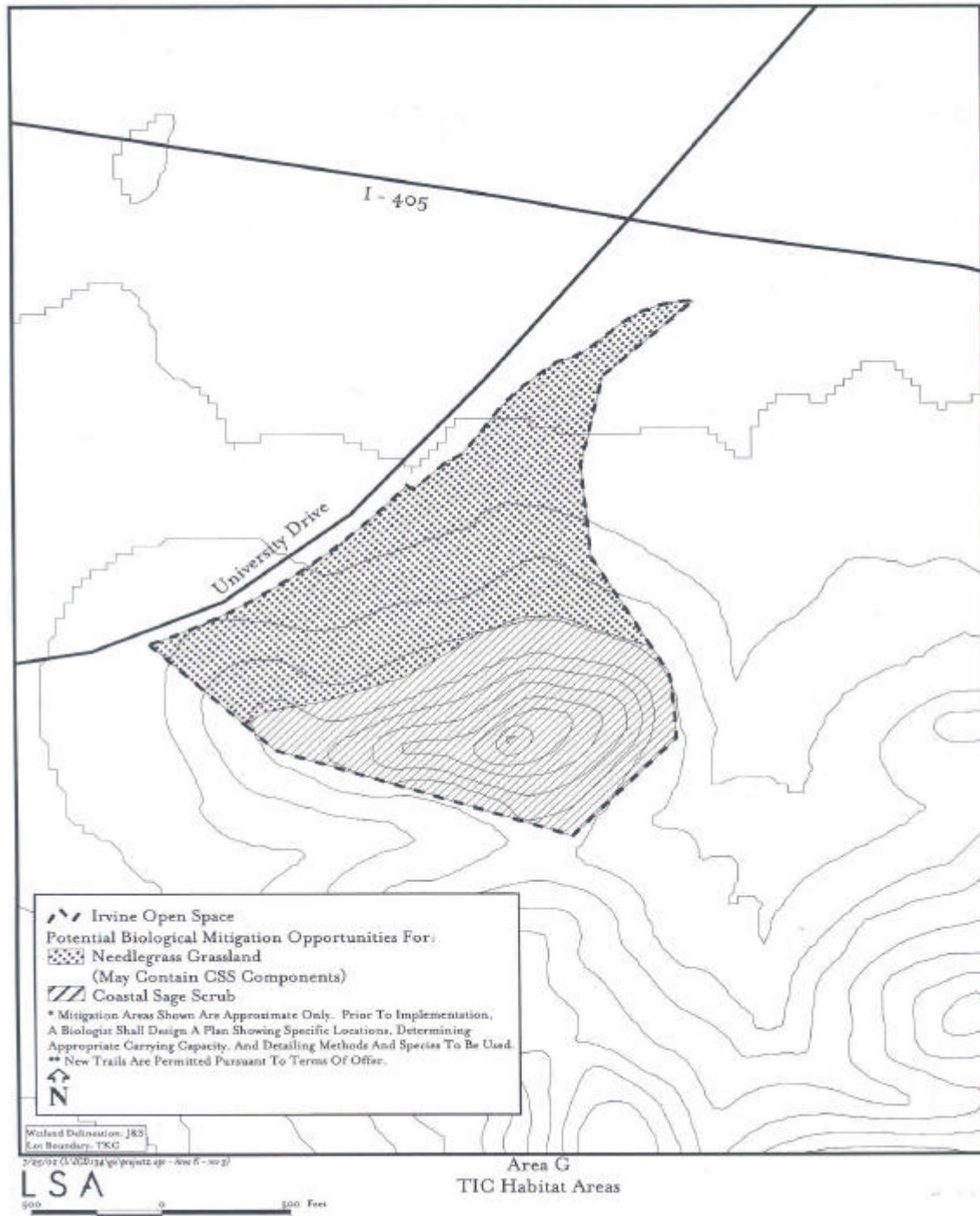
For purposes of this document and the operations of the Preserve, Restoration shall mean the transition of habitats containing non-native plant materials to habitats containing only native materials. These can be small or large scale projects, completed as maintenance, by volunteer forces, or by contracted 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**

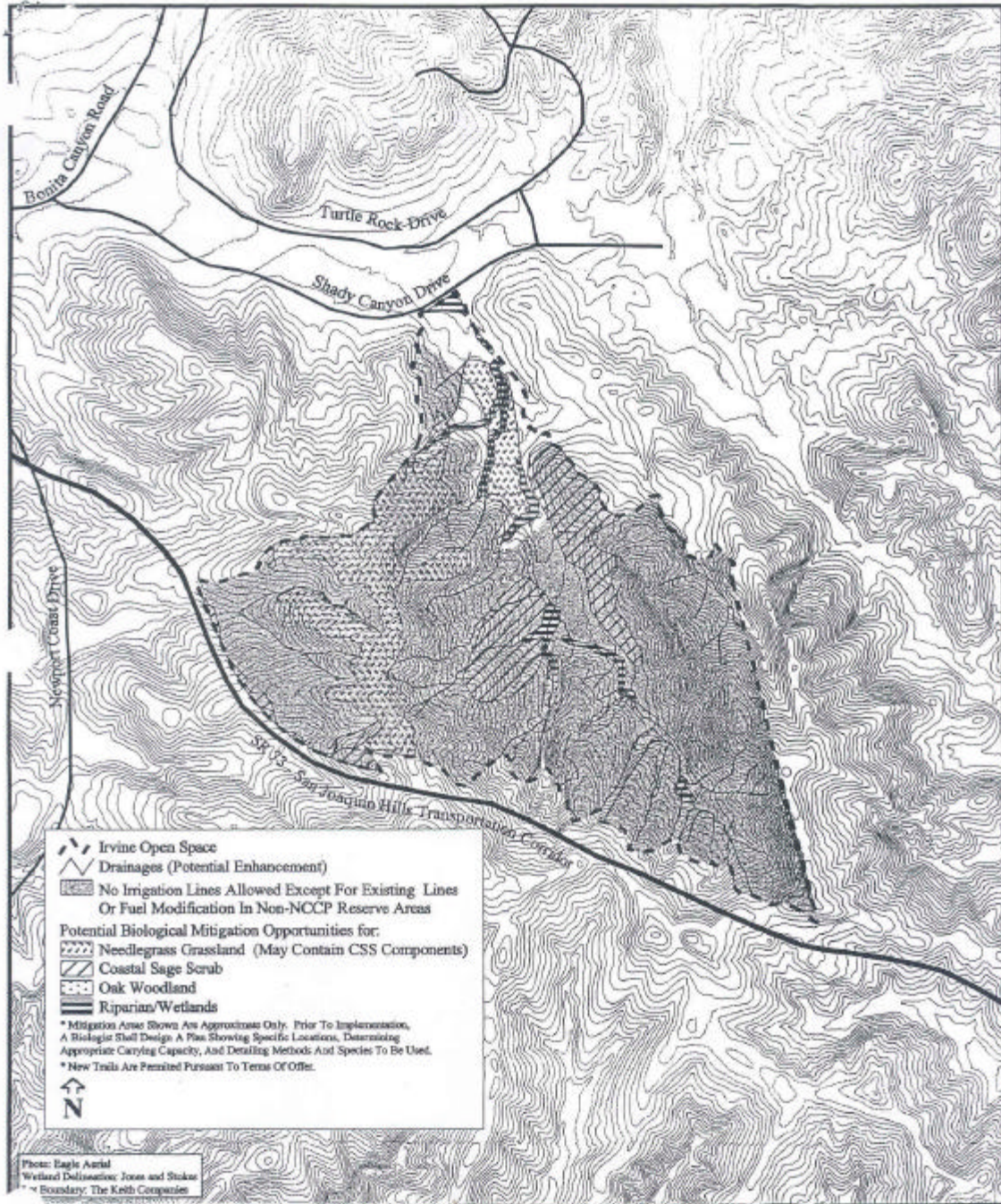
MITIGATION SITES MAPS

EXHIBIT E



MITIGATION SITES MAPS

EXHIBIT E



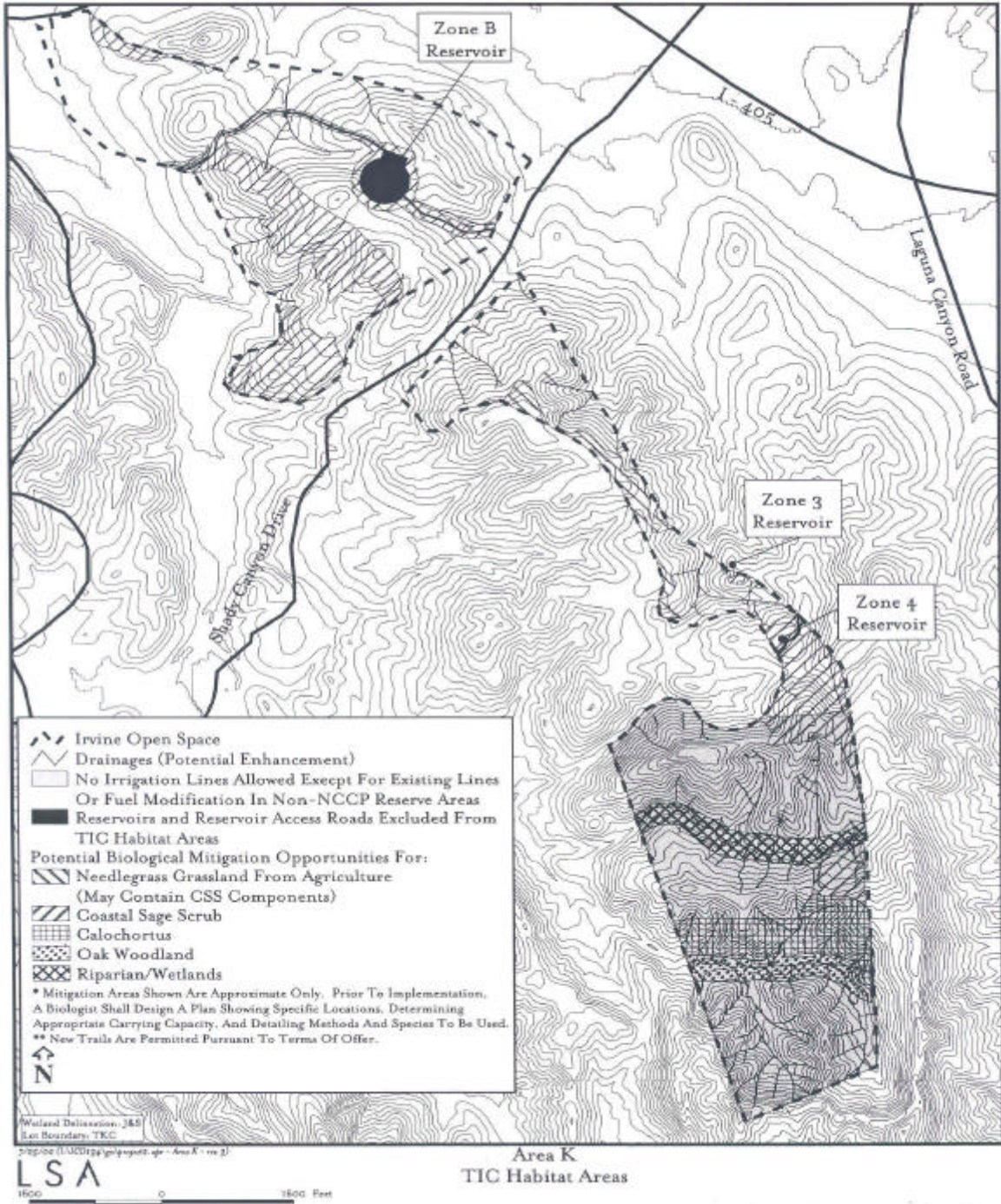
LSA

2000 0 2000 Feet

Area L
 TIC Habitat Areas

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



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**