

**BIG CANYON NATURE PARK
RESOURCE AND RECREATION MANAGEMENT PLAN
Orange County, California**

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ACRONYMS

AMP	Adaptive Management Program
AMSL	Above Mean Sea Level
ASBS	Areas of Special Biological Significance
BCC	Fish and Wildlife Service: Birds of Conservation Concern
BCNP	Big Canyon Nature Park
BMP	best management practices
CCA	California Coastal Act
CCC	California Coastal Commission
CCI	Community Conservancy International
CDFW	California Department of Fish and Wildlife
CGA	Coastal Greenbelt Authority
CSC	California Special Concern Species
CSS	Coastal Sage Scrub
CNDDDB	California Natural Diversity Database
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	environmental study areas
ESHA	Environmentally Sensitive Habitat Areas
FE	Federally listed as endangered
FMU	Fire Management Unit
FMZ	Fuel Modification Zone
FSC	Federal species of concern
FT	Federally listed as threatened
GPS	Global Positioning System
HBP	County of Orange Harbors, Beaches, and Parks District
HCP	Habitat Conservation Plan
HREP	Habitat Restoration and Enhancement Plan
HA	Hydrologic Area
HSA	Hydrologic Sub-Area
HU	Hydrologic Unit
IA	Implementation Agreement
IRC	Irvine Ranch Conservancy
IRCWMP	Central Orange County Integrated Regional and Coastal Watershed Management Plan
IRWD	Irvine Ranch Water District
LCP	Local Coastal Program
LUP	Land Use Plan

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MPA	Marine Protected Area
MYA	million years ago
NBFD	Newport Beach Fire Department
NCC	Natural Communities Coalition
NCCP	Natural Community Conservation Plan
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NROC	Nature Reserve of Orange County
RRMP	Resource and Recreation Management Plan
RWQCB	Regional Water Quality Control Board
SE	State-listed as endangered
ST	State-listed as threatened
TCA	Transportation Corridor Agencies
TIC	The Irvine Company
TMDL	total maximum daily loads
USACE	U.S. Army Corps of Engineers
USBC	U.S. Bird Conservation Watch List
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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EXECUTIVE SUMMARY

Big Canyon is a natural canyon that occurs within the City of Newport Beach (City), Orange County, California (County). The canyon is bounded by urbanized areas, including single-family residences, roadways, and the Big Canyon Golf Course. The Big Canyon Creek watershed encompasses approximately 1,200 acres (2 square miles) from its headwaters located near the San Joaquin Reservoir to the mouth of Big Canyon Creek where it discharges into Upper Newport Bay.

The lower reach of the Big Canyon watershed has been significantly altered over the decades. As early as the 1950s and 1960s, the lower reach of Big Canyon has been influenced by the construction of salt evaporation ponds, historical placement of dredge and fill material, interim restoration efforts, and other anthropogenic activities. Stockpiling of dredge fill during the 1950s and 1960s within Big Canyon Creek raised the elevations within the canyon and consequently channelized the creek to the north.

The City has a history of protecting, conserving, and maintaining valuable open space areas that define the City's urban form, serve as habitat for many species, and provide recreational opportunities to the public. In 2002, the City identified the mouth of Big Canyon as an "environmental study area" (ESA) within its General Plan due to its unique biological resources. In 2005, the City authorized the acceptance of certain scenic easements, a resource preservation easement, and fee ownership of reserves and open space lands within its' watersheds. The City revised the Natural Resources Element of their General Plan to provide direction regarding the conservation, development, and utilization of natural resources within their sphere of influence. In 2013, the Irvine Ranch Conservancy (IRC) accepted interim management of natural and recreational resources in Big Canyon Nature Park (BCNP) and in 2014, began working with the City and its partners on a concept plan for Big Canyon that would be the focus of future efforts to improve natural and recreational resources in the Park. Many of the proposed elements addressed in this plan developed out of these 2014 collaboration meetings.

The Big Canyon Nature Park is designated as non-Reserve open space lands within the Central-Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan. Although not part of the Reserve system, appropriate management of the natural resources within the park is important to meet the City's goal of enhancing habitat and recreational resources in their open space. Preparation of this Resource and Recreation Management Plan (RRMP) is a critical component of identifying, preserving, and protecting the unique resources of the BCNP while integrating passive recreation uses, as appropriate. Furthermore, the RRMP represents a general future vision for the park that incorporates input from multiple stakeholders, including surrounding land owners, the resource agencies, local

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environmental and education organizations, and the general public. As such, this RRMP was developed in consideration of the larger Newport Bay environment and a community of people and organizations that enjoy and manage it.

The RRMP, contained herein, describes the regulatory setting, existing conditions, potential issues and threats, public access and recreation management, the physical and natural resources management, and the monitoring and adaptive management of resources located within Big Canyon. This RRMP will be submitted for review and recommendation to the City, and at the City's discretion, to the California Department of Fish and Wildlife, the U.S. Fish and Wildlife Service, and the Natural Communities Coalition Board of Directors.

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1 INTRODUCTION

Upper Newport Bay is one of the largest remaining natural estuaries in Southern California. The public open space is comprised of three management areas: the 752-acre Upper Newport Bay Ecological Reserve (also designated a Marine Protected Area (MPA) and managed by the California Department of Fish and Wildlife), the 140-acre Upper Newport Bay Nature Preserve (managed by the Orange County Parks), and approximately 50 acres within Big Canyon.

The portion of the Upper Newport Bay evaluated for this management plan encompasses the 39-acre Big Canyon Nature Park (BCNP), which is owned by the City of Newport Beach and managed by the Irvine Ranch Conservancy (IRC) on an interim basis, approximately 11 acres of the Upper Newport Bay Ecological Reserve, plus a 100-foot buffer surrounding these open space areas for a total of approximately 72 acres. This 72-acre Big Canyon Nature Park Study Area (Study Area) is situated between Upper Newport Bay (west of Back Bay Drive) and Jamboree Road within the central-western half of the City of Newport Beach (City), Orange County, California (County). This Resource and Recreation Management Plan (RRMP), the management recommendations contained herein apply only to the City-owned 39-acre BCNP. However, City restoration efforts must be integrated appropriately with the adjacent California Department of Fish and Wildlife (CDFW) property. Therefore this RRMP has been developed in consultation with CDFW and other stakeholders to consider land management objectives on adjacent properties.

BCNP includes the slopes and floodplain of Big Canyon Creek which flows directly into Upper Newport Bay. BCNP is the only natural, undeveloped portion of the Big Canyon Creek watershed, and the only significant remaining natural canyon on the east side of Newport Bay. Although bounded by urban development to the north, east, and south, BCNP is comprised of several native vegetation communities, including coastal scrub, riparian scrub, riparian forest, alkali-saline wetland, and freshwater emergent wetland. BCNP also provides immediate access to estuarine areas of Upper Newport Bay.

BCNP occurs within the Orange County Central-Coastal Subregion Natural Community Conservation Plan and Habitat Conservation Plan (NCCP/HCP), but outside the 37,380-acre habitat reserve (the Reserve) (County of Orange 1996).

1.1 Purpose and Need for RRMP

Big Canyon encompasses approximately 50 acres of open space for wildlife habitat and recreational use. However, the quality of habitat and recreational resources do not currently meet the City's and State's desired standards. Big Canyon and its surrounding environs have

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been impacted by decades of land use and hydrological changes which have removed or degraded natural habitats, diminished water quality, and decreased its recreational values. Elements of the existing trails, facilities, and interpretive elements are worn and outdated.

To address these concerns, the City of Newport Beach in partnership with the Irvine Ranch Conservancy, CDFW¹, Newport Bay Conservancy (NBC), California Coastal Commission, and Inside the Outdoors initiated meetings in 2014 to discuss a long-term vision for Big Canyon. Following several discussions at City Hall, a concept plan emerged which captured a core set of improvements to natural and recreational resources all partners supported. This concept plan is the basis for many of the enhancements proposed and developed more fully in this RRMP.

Although BCNP is not part of the NCCP/HCP Reserve system, this resource management plan has been prepared to a level of detail consistent with the components and applicable policies of the NCCP/HCP and will (1) provide a comprehensive, long-term management plan that provides guidance on future policy, land use, and resource management decisions, and (2) serve as the formal RRMP should the City enroll BCNP into the Reserve system in the future. Guiding principles for the BCNP RRMP include:

- Maintain the highest integrity and sustainability of natural resources in perpetuity through active management
- Implement best management practices to protect and enhance the natural resource values of Big Canyon
- Promote vegetation management practices that enhance wildlife habitat values while addressing fuel modification concerns
- Provide safe recreational and educational opportunities for the local and regional community.

Key elements of the BCNP RRMP include policies for managing and monitoring research, habitat restoration and enhancement, fire management, public access and recreation, and infrastructure of the open space. This RRMP sets clear standards for the City and/or their land manager to appropriately manage the BCNP over the next several decades, but also incorporates an adaptive management structure. The adaptive management aspects of the plan have been designed to allow flexibility in management approaches in response to ecosystem needs as identified through ongoing research and monitoring.

¹ Please note the California Department of Fish and Game (CDFG) was officially renamed the California Department of Fish and Wildlife (CDFW), effective January 2013. The CDFG is cited for any data, documents, or coordination prior to 2013, and CDFW is cited for any data, documents, or coordination since January 1, 2013.

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The RRMP will be reviewed regularly to assess the success of established management strategies and evaluate any amendment measures. The Big Canyon RRMP, at the City's discretion, will be submitted for approval to the CDFW, the U.S. Fish and Wildlife Service (USFWS), and the Natural Communities Coalition (NCC).

1.2 Big Canyon Nature Park Location

BCNP is located in the City of Newport Beach, Orange County, California (Figure 1). It is situated within the lower reach of the Big Canyon Creek watershed that originates approximately 2 miles upstream to the southeast. The watershed draining into BCNP encompasses approximately 1,200 acres (2 square miles), from its headwaters located near the San Joaquin Reservoir east of MacArthur Boulevard. Big Canyon Creek flows from southeast to northwest through the 39-acre BCNP, ultimately draining into Upper Newport Bay. BCNP is located in Sections 24 and 25 of Township 6 South, Range 10 West of the Newport Beach 7.5 minute U.S. Geological Survey (USGS) topographic quadrangle (Figure 2).

Big Canyon occurs within the coastal portion of the Orange County Central-Coastal Subregion NCCP/HCP and is designated as open space (County of Orange 1996). The entire BCNP is mapped within the coastal zone and is bounded by urbanized areas, including single-family residences, roadways, and a golf course adjacent to the east portion of the BCNP open space area (Figure 3).

1.3 Historical Overview/Relationship to Other Plans

1.3.1 California Coastal Act

The California Coastal Act (CCA) was enacted in 1976 as a comprehensive planning and regulatory program to manage conservation and development within the California coastal zone. The State Legislature identified 1.5 million acres of land within the coastal zone, which extends up to 3 miles inland from the Pacific coast. The CCA also protects "environmentally sensitive habitat areas" (ESHAs), which are defined as areas with rare or ecologically valuable plants, animals, or habitat that could be easily impacted by human activities. The CCA prohibits land uses that would significantly degrade the habitat or recreational value of the ESHA (Public Resources Code Sections 30107.5 and 30240). The BCNP contains coastal sage scrub habitat that may be considered an ESHA due to the presence of the coastal California gnatcatcher (coastal California gnatcatcher (*Polioptila californica californica*), a federally threatened species and California Species of Special Concern.

The California Coastal Commission (CCC) regulates development within the coastal zone through issuance of coastal development permits and review and approval of Local Coastal

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Programs (LCPs). These LCPs are drafted and implemented by coastal cities and counties to establish consistency with the CCA and typically consist of local zoning ordinances and other measures within a Land Use Plan (LUP).

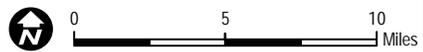
BCNP occurs within the coastal zone (Figure 3) and includes proposed construction activities within an ESHA, and therefore, subject to the CCA. Preparation of a Coastal Development Permit would be required for any future restoration within the BCNP. However, these future restoration activities would maintain the current open space land use designation and result in a net increase to amount, functions, and values of existing coastal sage scrub habitat within the ESHA. Therefore, implementation of the Big Canyon RRMP would be consistent with the CCA.

1.3.2 City of Newport Beach General Plan

In 1988, the City developed the Natural Resources Element of their General Plan to provide direction regarding the conservation, development, and utilization of natural resources within their sphere of influence. The element identifies existing natural resources and establishes policies for the preservation, development, and wise use of these resources.

In 2002, a biological assessment study was conducted to update the biological resource sections of the City's General Plan (Chambers Group and Coastal Resources Management 2003). The biological assessment utilized the ESHA definition to describe 28 areas, including the 12 areas described in the existing LCP LUP. The report identified these biological resources as "environmental study areas" (ESAs), and documented potential threats and appropriate mitigation measures for impacts to these resources. One ESA was identified for the Study Area, Mouth of Big Canyon (#8). This ESA includes all of BCNP.

A subsequent biological resource addendum to the LCP LUP prepared by EIP Associates (2003) to determine whether the ESAs qualified as CCA-defined ESHAs. Four criteria were established for an area to be classified as an ESHA and, therefore, subject to the development restrictions of the CCA: (1) presence of CDFW/California Natural Diversity Database (CNDDDB) natural communities; (2) recorded or potential presence of plant or animal species designated as rare, threatened, or endangered; (3) presence of coastal streams or wetlands; and (4) an adequate degree of habitat integrity and connectivity. Based on these criteria, the ESA within BCNP qualifies as a CCA-defined ESHA.



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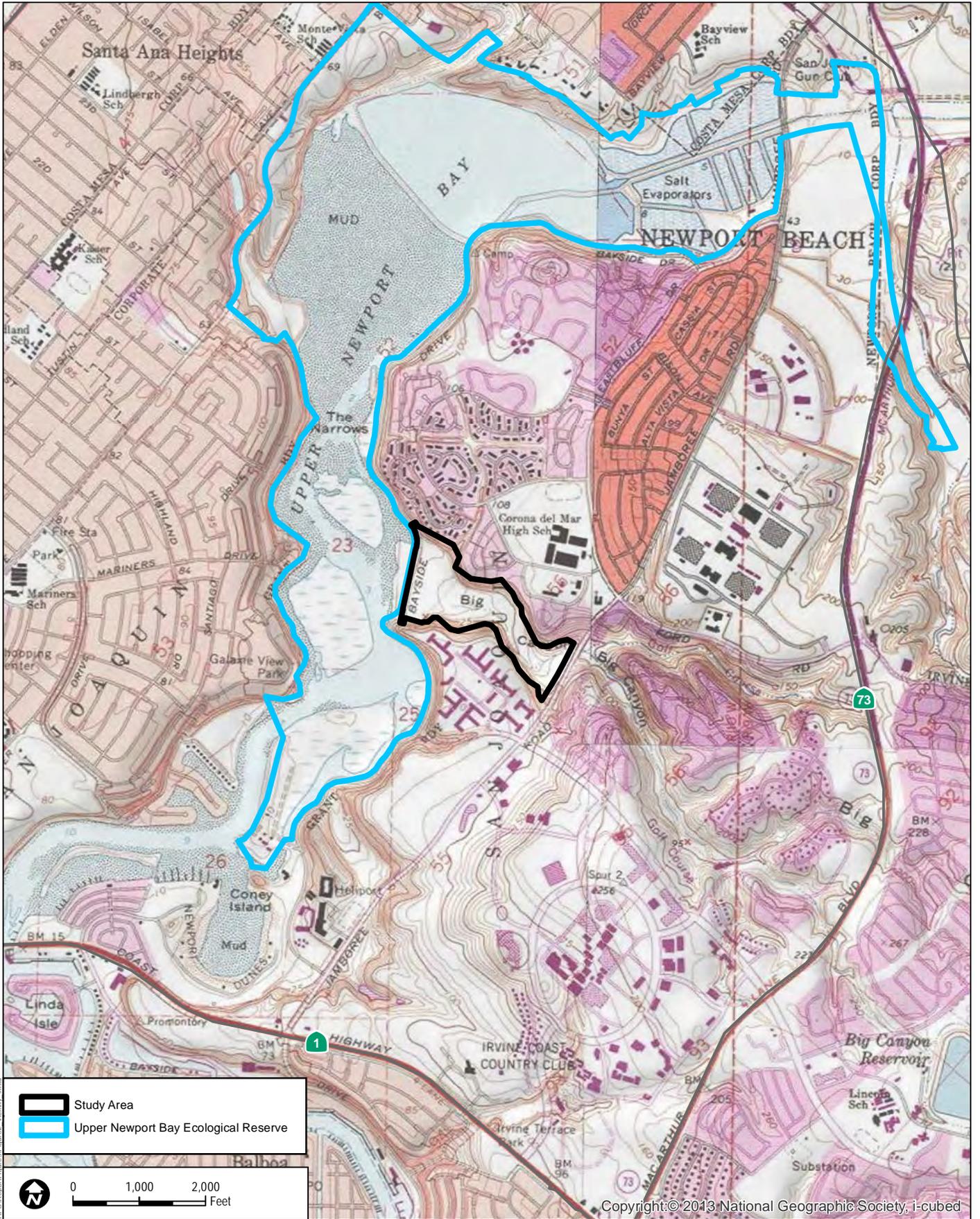
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**FIGURE 1
Regional Map**

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SOURCE: USGS 7.5-Minute Series - Newport Beach Quadrangle.

FIGURE 2
Vicinity Map

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Big Canyon - Resource & Recreation Management Plan

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In addition to identification of ESAs and ESHAs, the Natural Resources Element of the City's General Plan Update includes policies that address issues related to biological resources within Big Canyon:

Goal NR 16, Protection and management of Upper Newport Bay commensurate with the standards applicable to our nation's most valuable natural resources (Goal HB 7).

Policy NR 16.2 Big Canyon Creek Restoration Project, Coordinate the Big Canyon Creek Restoration Project so that its outcomes are consistent with goals for Upper Newport Bay established by Orange County and the Department of Fish and Game. (Imp 14.3, 14.7). This restoration project's concept and design have changed; however, appropriate elements of this policy will be incorporated within future restoration efforts.

1.3.3 City of Newport Beach Coastal Land Use Plan

The City's LUP was certified on May 18, 1982, but did not include the Newport Dunes, a County-owned area within the City. An amendment to the CCA in 2001 required the City to submit the LCP for the entire coastal zone within its boundaries. The City approved the first part of the LCP, the Coastal LUP on May 25, 2004. The CCC approved the LUP with suggested modifications on October 13, 2005 (CCC 2005), and signed off by the Executive Director on February 8, 2006. The comprehensive update revised all policy areas including land use and development; public access and recreation; and coastal resource protection within the Coastal Zone (excluding Banning Ranch and Newport Coast).

Adoption of the RRMP would be consistent with the CCA and City's LUP conditions, and would not require a separate LUP or coastal development permit from CCC. Implementation of any management actions identified in this RRMP may be subject to further planning and permitting requirements.

1.3.4 Central-Coastal Subregion Natural Community Conservation Plan/Habitat Conservation Plan

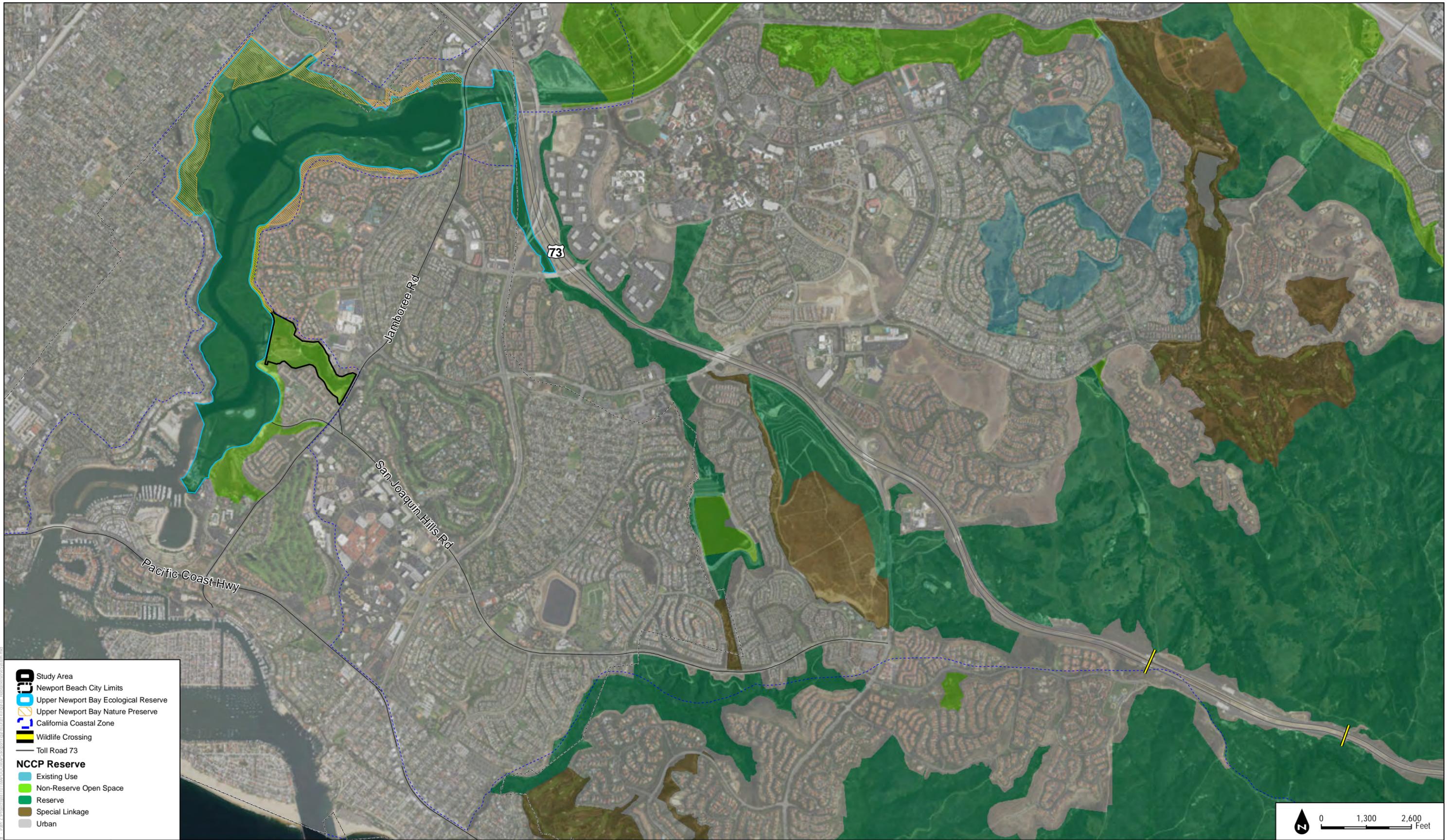
In July 1996, the County, USFWS, CDFW, the Transportation Corridor Agencies (TCA), and several large private and public landowners adopted a NCCP/HCP for the 208,000-acre Central-Coastal Subregion, which encompasses an area from the Santa Ana River to San Juan Creek and between the Pacific Ocean coastline inland to Riverside County. An Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the plan was prepared with the County and USFWS as lead agencies and CDFW as the responsible agency. Based upon the Central-

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Coastal NCCP/HCP, USFWS and CDFW authorized “take” of “Identified Species”² and approved modification of “Covered Habitats” under the California and federal ESAs and the federal Migratory Bird Treaty Act. Following the certification of the EIR/EIS, the participating agencies and landowners, the USFWS, the CDFW and the County signed an Implementation Agreement (IA) which set forth the implementation requirements for the Central-Coastal NCCP/HCP, including requirements related to dedication, creation and management of a 37,380-acre NCCP/HCP Reserve System, as well as procedures and minimization measures related to take of Identified Species and modification of habitat in those areas designated for development under the Central-Coastal NCCP/HCP. These approvals and authorizations, and their conditions, apply under the IA to certain geographic areas, including development areas identified in the Central-Coastal NCCP/HCP. The NCCP/HCP Reserve System and an Adaptive Management Program (AMP) created as part of the approved NCCP/HCP is the cornerstone for the take authorization and habitat modification approvals issued by CDFW and USFWS granting state/federal regulatory authorization to take 39 plant and animal species. Appendix A lists the 29 species that are “Covered” and the 10 additional species that are “Conditionally Covered” in the Central-Coastal NCCP/HCP. In addition, coastal sage scrub (CSS) and four other general habitat types are identified as Covered Habitats: oak woodlands, Tecate cypress, cliff and rock, and chaparral (Coastal Subarea only).

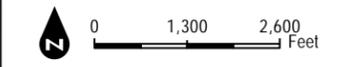
The Central-Coastal NCCP/HCP provides conservation of natural communities from an ecosystem approach, while allowing compatible land use and economic activity by encouraging cooperation between private and government interests. The Central-Coastal NCCP/HCP affects land use decisions in the planning area that may affect Identified Species and Covered Habitats. Twelve major vegetation types are preserved by the Central-Coastal Subregion NCCP/HCP, in return for authorization of incidental “take” (i.e., harass, harm, pursue, hunt, shoot, wound, kill trap, capture, or collect) of 39 species of sensitive plants and wildlife within the remaining portions of the 208,000-acre planning area. The Reserve system consists of two subregions, Central and Coastal. Reserve design for the Coastal Subregion focuses primarily on usable wildlife corridor connections between the San Joaquin Hills (the Core Reserve) and peripheral areas of high biological value (e.g., Upper Newport Bay). The Central-Coastal Subregion NCCP/HCP also designates non-Reserve Special Linkages and Existing Use Areas, which benefit the species covered by the Central-Coastal Subregion NCCP/HCP, but are not subject to Reserve adaptive management policies and use restrictions (County of Orange 1996).

² "Target Species" and "Identified Species" were proposed for regulatory coverage under the Central-Coastal NCCP/HCP. Within the text of this report, species that received coverage under this plan are referred to as "Covered Species" and "Conditionally Covered Species."



Legend

- Study Area
- Newport Beach City Limits
- Upper Newport Bay Ecological Reserve
- Upper Newport Bay Nature Preserve
- California Coastal Zone
- Wildlife Crossing
- Toll Road 73
- NCCP Reserve**
- Existing Use
- Non-Reserve Open Space
- Reserve
- Special Linkage
- Urban



SOURCE: Google Imagery, 2015; County of Orange, 01/27/2014; California Coastal Commission, 2012.



FIGURE 3
Habitat Reserve System Map

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BCNP is connected to the Upper Newport Bay Preserve, which is managed by the CDFW. The upper portion of the BCNP is hydrologically connected to the Big Canyon Country Club that extends to the east. BCNP is identified as non-Reserve Open Space within the Coastal Subregion (Figure 3). This public open space area was not considered suitable for inclusion in the CSS management program due to a lack of significant CSS habitat, the absence of “target species.” However, the BCNP was determined to provide “medium” habitat value.

Figure 4 illustrates the biological value and sensitive species distribution as defined within the Central-Coastal Subregion NCCP/HCP that occur within the BCNP. More recently, focused sensitive plant and wildlife surveys have been conducted within the BCNP (Dudek 2015; Roberts 2015). Figure 5 displays the recorded observations from 2015 surveys within the BCNP.

The Central-Coastal Subregion NCCP/HCP does not allow take authorization for (i.e., impacts to) CSS habitat or covered species within the 3,831-acre non-Reserve open space (Section 4.4.3.2). Accordingly, conversion of CSS or “take” of covered species within the permanent non-Reserve open space are not mitigated by the NCCP/HCP. Proposed projects that would result in impacts or incidental take would require separate review by the resource agencies to determine compliance with applicable state and federal species protection laws/regulations. Although implementation of the RRMP is not anticipated to result in significant impacts to Identified Species or Covered Habitats, additional coordination with the Army Corps of Engineers (USACE), CDFW, Regional Water Quality Control Board (RWQCB), and/or the USFWS may be required.

1.3.5 Nature Reserve of Orange County

The Nature Reserve of Orange County or NROC encompasses 38,738 acres of permanently protected open space within the Central-Coastal NCCP/HCP. The NROC protects more than 18,800 acres of coastal sage; 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.

The NROC is managed by a Board of Directors that includes a combination of private and public landowners, resource agencies, local governments, and community representatives:

- USFWS
- CDFW
- California Department of Parks and Recreation
- County of Orange

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- Irvine Ranch Water District
- Metropolitan Water District
- Southern California Edison
- Santiago County Water District
- University of California at Irvine
- TCAs
- City of Newport Beach
- City of Irvine
- The Irvine Company
- Headlands Reserve LLC
- California Department of Forestry and Fire Protection
- CGA
- Orange County Fire Authority.

The Natural Communities Coalition or NCC, formerly known as NROC, is the non-profit corporation that coordinates science and land management across the Nature Reserve. Created with the establishment of the 38,738-acre Reserve System, the NCC serves numerous roles, including (1) coordinating participating land owners/managers activities to ensure consistency with the Central-Coastal NCCP/HCP, (2) receiving and distributing funds to Reserve owners/managers, (3) preparing annual reports for the wildlife agencies, (4) developing Reserve System management programs to implement the Central-Coastal Subregion NCCP/HCP policies (Fire Management, Grazing, Recreation, and Restoration/Enhancement), (5) conducting and/or managing habitat/wildlife monitoring and invasive plant removal projects, (6) hiring staff to implement adaptive management activities, and (7) facilitating technical advisory committees comprised of NCCP/HCP participants and scientific experts.



Study Area
 Big Canyon Nature Park
CCNCCP Species
 Swainson's thrush
* yellow-breasted chat
● southwestern pond turtle
⬠ least Bell's vireo
▲ willow flycatcher
◇ coastal California gnatcatcher
NCCP Reserve
 Non-Reserve Open Space
 Reserve
 Urban

N
 0 180 360
 Feet

SOURCE: Google Imagery, 2015; CNDDDB, 05/05/2015; County of Orange, 2014.

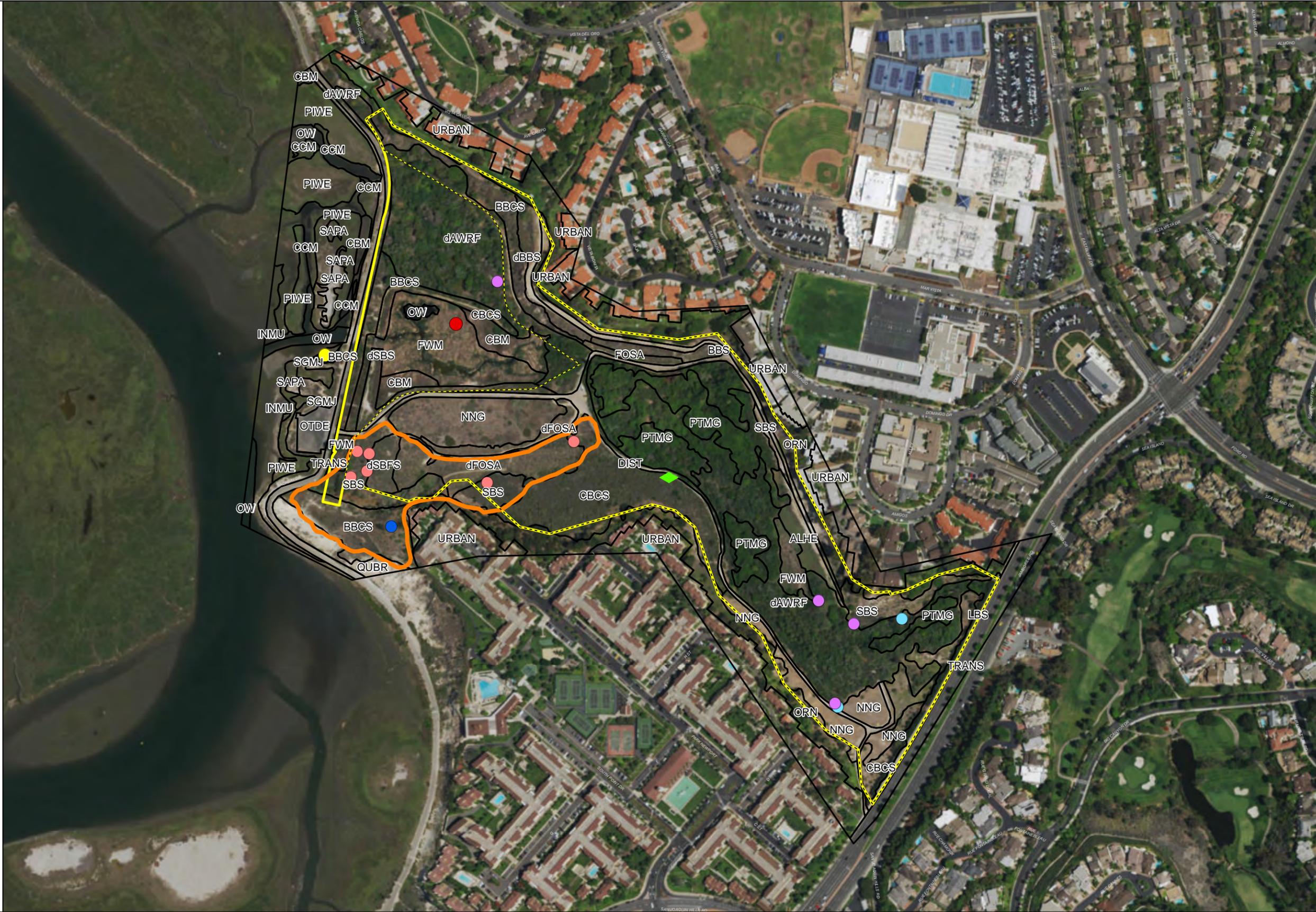
DUDEK

Big Canyon - Resource & Recreation Management Plan

FIGURE 4
Sensitive Species Map Central and Coastal NCCP/HCP Data

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- Study Area
- Big Canyon Nature Park
- CAGN Use Area
- CNDDDB Occurrence**
- ◆ coastal California gnatcatcher
- Sensitive Species**
- CAGN
- CAGN Pair
- YBCH
- YEWA
- OSPR
- WTKI
- Vegetation Communities
- ALHE, Alkali Heath Marsh Alliance
- BBCS, California Brittle Bush-California Sagebrush Association
- BBS, California Brittle bush Alliance
- CBCS, Coyote Brush-California Sagebrush Association
- CBM, California Bulrush Marsh Alliance
- CCM, California Cordgrass Marsh Alliance
- DIST, Disturbed or Barren Mapping Unit
- FOSA, Fourwing Saltbush Alliance
- FWM, Cattail Marshes Alliance
- INMU, Intertidal Mudflat Mapping Unit
- LBS, Lemonade Berry Alliance
- NNG, Upland Mustards Semi-natural Stands
- ORN, Ornamental Landscaping Mapping Unit
- OTDE, Other Developed Areas Mapping Unit
- OW, Open Water Mapping Unit
- PIWE, Pickleweed Mats Alliance
- PTMG, Pepper Tree or Myoporum Groves Semi-natural Stands
- QUBR, Quailbush Alliance
- SAPA, Salt Panne Mapping Unit
- SBS, California Sagebrush Alliance
- SGMJ, Salt Grass-Marsh Jaumea Association
- TRANS, Transportation Mapping Unit
- URBAN, Urban and Commercial Mapping Unit
- dAWRF, Arroyo Willow Disturbed Mapping Unit
- dBBS, California Brittle Bush Disturbed Mapping Unit
- dFOSA, Fourwing Saltbush Disturbed Mapping Unit
- dSBFS, California Sagebrush-Fourwing Saltbush Disturbed Mapping Unit
- dSBS, California Sagebrush Disturbed Mapping Unit



SOURCE: Google Imagery, 2015; County of Orange, 2014.



FIGURE 5
Sensitive Species Map

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Big Canyon Nature Park Resource and Recreation Management Plan

NCCP/HCP Habitat Restoration and Enhancement Plan

As a requirement of the NCCP/HCP for the County Central-Coastal Subregion, a Habitat Restoration and Enhancement Plan (HREP) was prepared for NCC to guide ongoing and future management practices throughout the Reserve (LSA 2003). The HREP provides the programmatic framework for implementing the following:

- Identify range of conditions at potential restoration/enhancement areas
- Provide information on the most cost-effective methods of restoration/enhancement
- Estimate potential restoration opportunities by habitat type within the NROC
- Recommend resource allocation priorities for future restoration/enhancement
- Prepare guidelines for site-specific plans to maximize success, while minimizing costs of individual restoration/enhancement efforts
- Identify and prioritize areas for weed management within the Reserve.

The HREP focuses on habitat restoration and enhancement opportunities, priorities, and techniques for CSS vegetation communities within the Reserve. All activities are coordinated through NCC to ensure compliance with the Central-Coastal Subregion NCCP/HCP program. Since the BCNP is not located within the Reserve, the HREP does not identify any primary exotic plants of concern or management issues specifically for Big Canyon. If the area becomes part of the Reserve, condition or species of concern in BCNP will be incorporated into the HREP.

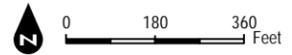
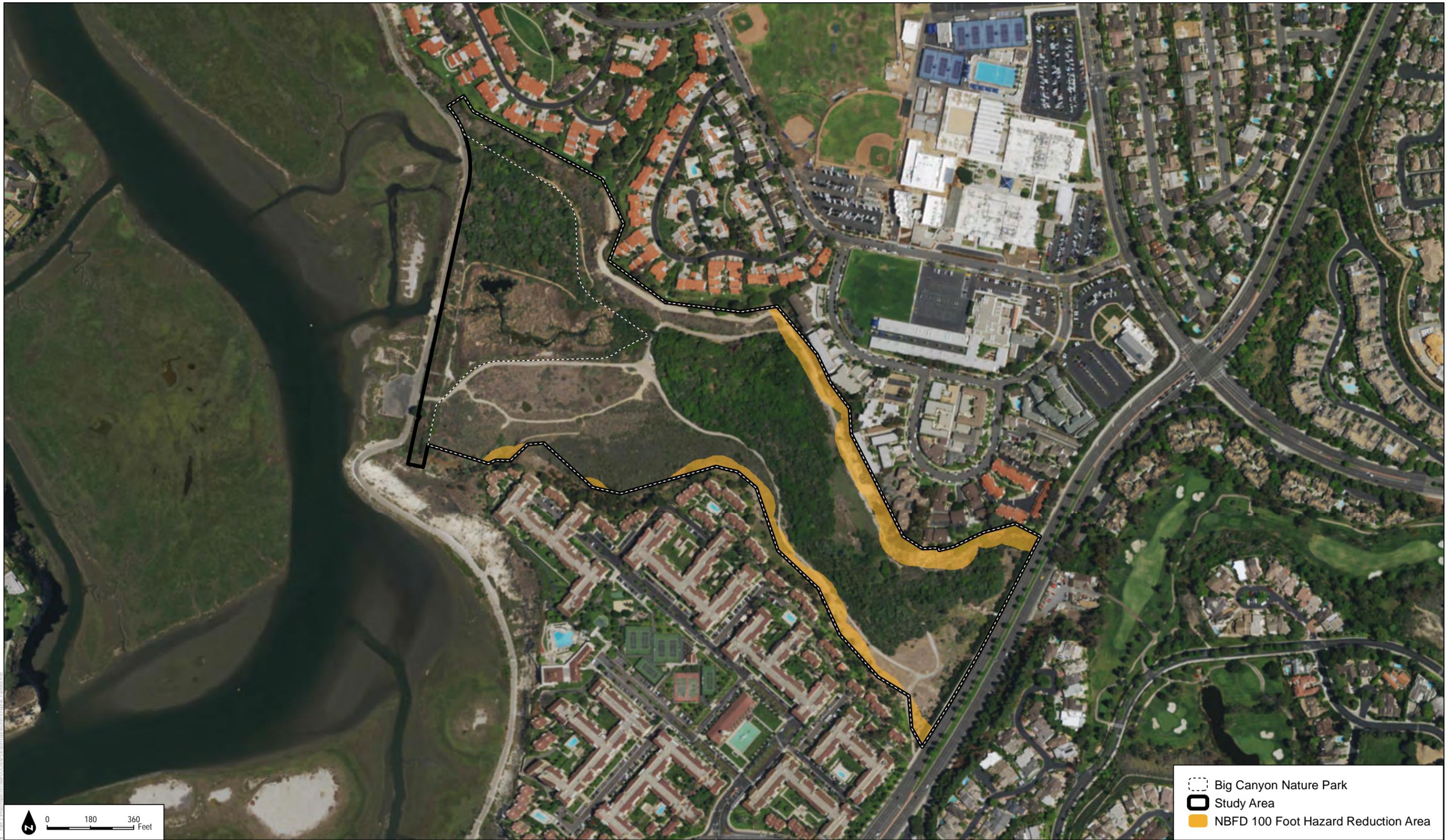
1.3.6 Newport Beach Fire Department Guidelines and Standards

The City of Newport Beach Fire Department (NBFD) consistent with CAL FIRE standards outlines guidelines and standards for the modification and maintenance of vegetation in areas adjacent to structures in order to create defensible space. Guideline G.01 (Hazard Reduction Zones) outlines such requirements for structures within City-defined Hazard Reduction Zones, which includes some of the residential properties abutting BCNP. Specifically, the Park Newport Apartments along the southern edge of BCNP and the structures along Amigos Way and Domingo Drive that abut BCNP are subject to the vegetation maintenance standards outlined in Guideline G.01.

Vegetation management under this Guideline is required within the area that extends 100 feet from any portion of structure facing a wildland area (hazard reduction zone (HRZ)). Guideline G.01 outlines requirements for vegetation spacing (horizontal and vertical), dead and dying plant

Big Canyon Nature Park Resource and Recreation Management Plan

removal, structure setback from vegetation, and allowable species. Structure setback distances from property lines vary for the properties subject to these guidelines that abut BCNP. As such, vegetation management to achieve the 100-foot standard in Guideline G.01 has historically been conducted within BCNP in key areas. The HRZ includes approximately 4.89 acres of the BCNP (Figure 6) and is subject to annual treatment by the City. Currently, the NBFD manages a City maintenance contractor to annually treat vegetation in the HRZ that falls within BCNP. Individual property owners are responsible for managing fuels on their property immediately adjacent to the HRZ.



-  Big Canyon Nature Park
-  Study Area
-  NBFD 100 Foot Hazard Reduction Area

FIGURE 6

City of Newport Beach Fire Department (NBFD) 100 Foot Hazard Reduction Zone

SOURCE: Google Imagery, 2015; City of Newport Beach, 2015.



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Big Canyon Nature Park Resource and Recreation Management Plan

1.3.7 Big Canyon Creek Historic Tidal Wetlands Conceptual Restoration Plan

Restoration planning in Big Canyon was initiated with a Phase I study in 2003 led by Community Conservancy International (CCI 2004). Partners and supporters of this project included the CCC, CDFW, National Marine Fisheries Service, USFWS, RWQCB, Harbor Commission, USACE, Department of Water Resources, Irvine Ranch Water District (IRWD), The Irvine Company (TIC), the Surfrider Foundation, and the California Coastkeepers.

The California Coastal Conservancy subsequently awarded a Southern California Wetlands Recovery Project grant and the City of Newport Beach contributed additional funding to CCI to prepare a conceptual restoration plan for Big Canyon. As part of the restoration planning, water quality sampling found that urban runoff in Big Canyon Creek contained fertilizers, pesticides, and bacteria (CCI 2004). The 2004 conceptual restoration plan (the Big Canyon Creek Restoration Project) proposed to reduce non-point source releases and improve water quality within Big Canyon and downstream to the greater Upper Newport Bay. The proposed integrated approach to improve water quality included addressing habitat fragmentation and degradation through non-native species removal and native plantings, increasing public awareness and recreation, and improving erosion control. A separate study was conducted in 2007 to assess the technical feasibility of a wetland restoration project that would restore tidal marsh and improve the connectivity of habitat within the BCNP (WRC 2007). The previous conceptual tidal wetland restoration plan developed under Phase I was assessed and refined during the course of the feasibility study. Technical investigations conducted for the 2007 study revealed that fecal coliform, surfactants (methylene blue active substances), metals (copper, zinc, and silver), and turbidity were above water quality objectives during wet and dry season sampling events (WRC 2007).

Key components to address water quality issues included:

- Replacing exotic species with native, non-invasive species throughout BCNP
- Reducing water flows to allow for sediment and other potential pollutant removal
- Creating effective riparian wetlands, coastal sage scrub and other habitat
- Providing recreational use opportunities through the creation of additional trails and public access points into BCNP
- Posting interpretative signage to assist the public in understanding the importance of the restored native habitat

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- Providing a valuable connection between urban development, restored coastal sage scrub, riparian, Upper Bay saltwater marsh habitat and the Lower Bay
- Providing a linkage to overall water quality improvement goal for the Upper and Lower Newport Bay.

The plan also considered increasing salt marsh habitat by re-routing the Back Bay Drive and excavating an area to allow Bay tidal flow into the mouth of the canyon. The plan also considered relocating the freshwater pond outside the influence of Big Canyon Creek and supplying the pond with potable water. In 2008, based on its substantial cost, the City opted to not move forward with this plan.

1.3.8 Central Orange County Integrated Regional and Coastal Watershed Management Plan (IRCWMP) – Phase II

In June, 2009, Newport Bay Watershed stakeholders released the Phase II Central Orange County IRCWMP. The Phase II plan listed 134 potential projects to protect or improve watershed resources. Projects were prioritized based on 11 types of project benefits as defined by Proposition 84 guidelines and on 13 types of potential types of project integration. The watershed was divided into six sub-regions based on local issues and objectives. The Big Canyon Restoration Project was identified as a potential key supporting project for the Bay/Coastal Planning Area. The recommendations outlined in this RRMP are consistent with the strategic direction of the Phase II IRCWMP and incorporate project benefits and types of integration promoted by the Plan.

1.3.9 Big Canyon Habitat Restoration and Water Quality Improvement Project - 2015

The six-acre Big Canyon Restoration Project and Water Quality Improvement Project (Restoration Project), located just to the west of Jamboree Road will:

- Restore historic riparian habitat by removing non-native vegetation and replace it with native plantings
- Stabilize the creek and floodplain
- Improve water quality in Big Canyon Creek and Newport Bay
- Enhance public access within the Big Canyon Nature Park

Big Canyon Nature Park Resource and Recreation Management Plan

The proposed project would implement creek restoration measures including floodplain restoration, streambank stabilization, and habitat restoration. Floodplain restoration and streambank stabilization measures will result in increased flood flow attenuation, stabilization of the north bank of the main channel, and creation of an active braided riparian floodplain. The north creek bank at the inlet will be stabilized using natural bioengineering techniques. Riparian habitat will be restored directly downstream of the floodplain restoration area through the removal of invasive trees, soil modification to reduce plant-limiting sodium levels, and replacement with native riparian species.

The proposed project would construct a bioretention cell water quality treatment wetland that would treat wet weather runoff from Jamboree Road before it enters Big Canyon Creek. A dry weather flow diversion that re-routes flows of low selenium concentration around identified sources of high selenium and return these better quality flows back into the creek downstream will also be constructed as a part of this project. Seeps that are sources of high selenium will be passively collected in a sump and diverted to the sanitary sewer.

1.4 RRMP Public Participation Process

The IRC has coordinated with numerous organizations, nonprofit groups, regulatory agencies, and the public regarding the desired state of the BCNP. Specifically, the City, CDFW, and Inside the Outdoors, a nonprofit organization administered by the Orange County Department of Education, have shared planning resources and evaluated technical proposals to study restoration alternatives within the canyon. Overall, the feedback received by outside entities has been positive. In addition, two public participation meetings are scheduled to solicit feedback on the management goals and strategies of the RRMP. The first public meeting followed the City's review of the RRMP, and a second public meeting followed the final draft of the RRMP.

1.5 RRMP Review and Approval Process

The Big Canyon RRMP was submitted for review and comment to the City. At the City's discretion, the document will be submitted for final approval by the CDFW and USFWS.

1.6 RRMP Updates and Amendments

City staff and/or their land manager (if any) will review the Big Canyon RRMP regularly to determine whether updates/amendments are warranted.

Big Canyon Nature Park Resource and Recreation Management Plan

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Big Canyon Nature Park Resource and Recreation Management Plan

2 RESERVE EXISTING CONDITIONS

2.1 Visual Resources

The BCNP is characterized by a relatively narrow and moderately sloping floodplain bound to the north and south by steeply sloping bluffs. Residential developments dominate the higher elevations within the Study Area. Big Canyon is the only significant remaining natural canyon on the east side of Upper Newport Bay, as well as the only natural and undeveloped portion of the Big Canyon Creek watershed. While there is extensive residential development surrounding Big Canyon to the north, east, and south, BCNP includes numerous native plant communities and is adjacent to Upper Newport Bay, which is part of the Central-Coastal Subregion NCCP/HCP Reserve Area. Thus, scenic overlooks occur throughout BCNP which provide views of Upper Newport Bay, canyon slopes, coastal plain, and native vegetation communities including native coastal scrub, riparian scrub, alkali-saline wetland, and freshwater emergent vegetation communities.

Big Canyon is one of the primary access points to the Upper Newport Bay, which is frequently visited by the public for recreation, wildlife observation, and wetland-based educational activities. Existing trails follow the northern edge of the freshwater wetland to the middle of the canyon, and cross over the stream to double back along the toe of the northern bluffs. This small system of existing trails provide access to the downstream portion of the canyon. Back Bay Drive (a single lane, one-way paved scenic road with pedestrian and bicycle trails occurring along the western extent of BCNP) follows the toe of the coastal bluffs on the east side of the estuary and offers a scenic view of the Upper Newport Bay Ecological Reserve. Upper Newport Bay is a large coastal wetland and major stopover for birds on the Pacific Flyway (a major north-south migratory route for migratory birds extending from Alaska to Patagonia). Numerous overlook areas exist along the road to provide rest stops where visitors can observe key natural features of the canyon and watch birds.

2.2 Physical Setting

2.2.1 Topography

The BCNP is characterized by a flat to moderately-sloping floodplain with steep northern and southern bluffs. Elevations within the BCNP ranges from below mean sea level at its western-most extent, where it intercepts with the Upper Newport Bay west of Back Bay Drive, to approximately 115 feet above mean sea level (AMSL) along the southern extent of the canyon. Although the central portion of the BCNP is relatively flat, the topography slopes moderately with slightly higher elevations occurring in the east (upstream) compared with the west

Big Canyon Nature Park Resource and Recreation Management Plan

(downstream). The eastern portion of the Big Canyon floodplain is approximately 50 feet AMSL, while the western portion of the Big Canyon floodplain ranges between 15 and 20 feet AMSL east of Back Bay Drive.

The BCNP has a combined maximum vertical relief of approximately 75 feet between the highest and lowest elevation points on the property. Slopes range in elevation from 20 to 75 feet AMSL, with Big Canyon Creek ranging from below mean sea level to 25 feet AMSL. The grade of slopes within the BCNP vary by location. The central portion of the BCNP is relatively flat with slopes averaging approximately 7%, while the bluffs to the north and south of the property exceed 50%.

2.2.2 Geology and Soils

The Newport Coast is generally underlain by marine shale (Monterey Formation), poorly consolidated sandstone (Capistrano Formation), and volcanic rocks that occur over terrace deposits and thin, narrow alluvial deposits (Todd Engineers and Rivertech 2006). The bluffs along the northern and southern boundaries of BCNP are primarily composed of the Miocene (17.5 to 6 million years old) Monterey Formation (Reeder 2011). The Monterey Formation is characterized by a high proportion of silica. Several types of siliceous rocks characterize the Monterey Formation and the base is comprised of various thickness of sandstone, sandy shale, and calcareous shale upon an irregular surface of granodiorite (Bramlette 1946). Diatomite and less pure diatomaceous rocks comprise the upper part of the formation. Additionally, a large part of the formation is made up of harder siliceous rocks classed as porcelanite, porcelaneous shale, cherty shale, and chert (Bramlette 1946). The Monterey Formation is a marine formation rich in organic carbon, which is enriched in numerous trace elements including chromium, copper, nickel, antimony, selenium, uranium, vanadium, zinc, arsenic, barium, cadmium, and molybdenum. These trace elements are potentially hazardous to aquatic life, human health, and the environment.

There is limited information concerning the hydrogeologic characteristics of the subsurface materials in the Big Canyon Creek watershed. The existing channel topography, geomorphology, hydraulic, and erosion/sedimentation features of Big Canyon Creek within the BCNP (lower reach of the Big Canyon watershed) have been significantly influenced by historical construction of salt evaporation ponds, placement of dredge and fill, as well as subsequent restoration efforts and other anthropogenic activities. Stockpiling of dredge fill within Big Canyon Creek raised the elevations within the BCNP, consequently rechanneling the creek to the north (WRC 2007).

The following eleven soil types are mapped within the project area:

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- Anaheim clay loam, 15% to 30% slopes;
- Anaheim clay loam, 30% to 50% slopes;
- Balcom clay loam, 30% to 50% slopes;
- Beaches;
- Calleguas clay loam, 50% to 70% slopes, eroded;
- Cieneba sandy loam, 30% to 75% slopes, eroded;
- Marina loamy sand, 2% to 9% slopes;
- Myford sandy loam, thick surface, 2% to 9% slopes;
- San Emigdio fine sandy loam, moderately fine substratum, 0% to 2% slopes;
- Sorrento loam, 2% to 9% slopes; and
- Tidal flats.

Beaches, tidal flats, and Sorrento loam, 2% to 9% slopes occur along Big Canyon Creek, dominating the central portion of the BCNP. The northern portion of the BCNP is dominated by Cieneba sandy loam, 30% to 75% slopes, eroded, with Marina loamy sand, 2% to 9% slopes and Balcom Clay loam, 30% to 50% slopes occurring along portions of the northernmost sections of the site. The southern extent of the BCNP is dominated by Anaheim Clay loam, 30% to 50% slopes, Anaheim clay loam, 15% to 30% slopes, and Calleguas clay loam, 50% to 75% slopes, eroded. A brief description of these soil series are provided below according to Wachtell (1978) and NRCS (2015). Although beaches and tidal flats do not belong to a soil series, these miscellaneous areas are also described below. Figure 7 illustrates the soil mapping units present within the BCNP.

Anaheim Series soils are formed in material weathered from fine-grained sandstone or shale. This soil is well-drained on moderately steep to very steep foothills. The soils identified within the Study Area have a loam texture. Runoff is rapid to very rapid with moderate to moderately slow permeability.

Balcom Series soils are formed in material weathered from soft, calcareous shale and fine-grained sandstone. This soil consists of moderately deep, well-drained soils with an effective rooting depth of 24 to 30 inches. The Balcom soil profile consists of loam, silt loam, clay loam, or silty clay loam with more than 15% fine sand or coarser. This soil is well-drained with low to high runoff and moderate to moderately slow permeability.

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Beaches support little to no vegetation and consist of sandy, gravelly, or cobbly coastal shores washed and rewashed by tidal and wave action. These areas have very slow runoff and high erosion hazard, and may be partly covered with water during high tide or stormy periods.

Calleguas Series soils are formed in material weathered from sedimentary rocks (i.e., sandstone, shale, and mudstone) on uplands, hills and mountains. Calleguas soils are very shallow and typically on exposed and eroded south-facing slopes. This soil is well-drained with medium or high runoff and moderate permeability. Textures vary between loams and silty clay loams.

Cieneba Series soils are formed in material weathered from granitic rock and typically very shallow, ranging between 4 and 20 inches in depth. This series includes somewhat excessively-drained soils with low to high runoff. Permeability is moderately rapid in the soil and much slower in weathered bedrock. Soil textures consist of coarse sandy loam, sandy loam, or loam with a gravelly modifier.

Marina Series soils are formed in old eolian sands near the coast. Marina soils occur on rolling dune-like, gently sloping to moderately steep slopes and terraces. This soil series is somewhat excessively-drained with slow to rapid runoff and moderate permeability. Soil depths range between 12 and 35 inches, with an effective rooting depth of 60 inches or more, and sand to loamy fine sand texture.

Myford Series soils are formed in sandy sediments on nearly level to moderately steep marine terraces. Myford soils are deep, moderately well-drained soils with medium to rapid runoff and very slow permeability. Soil textures range between sandy loam and sandy clay loam.

San Emigdio Series soils are primarily formed in sedimentary alluvium. This soil is very deep and well-drained. It commonly occurs on alluvial fans, floodplains, and in narrow valleys. Runoff is negligible to low with moderately rapid permeability. Soil texture is coarse sandy loam, sandy loam, fine sandy loam, silt loam, or loam to a depth of 40 inches with rock fragments greater within the lower portion of the profile.

Sorrento Series soils are formed in extremely textured alluvium primarily from sedimentary rocks. Sorrento soils are very deep, well-drained soils on alluvial fans and stabilized floodplains. Runoff is negligible to medium with moderate to moderately slow permeability depending on the dominant texture and stratification in the lower portion of the profile.

Tidal Flats are stratified clayey to sandy deposits found on nearly level areas adjacent to bays and lagoons along the coast. These areas can periodically be covered by tidal overflow, with some of the higher areas only covered during very high tides. Runoff generally ponds, thus tidal flats are poorly drained and high in salts.

Big Canyon Nature Park

Study Area

Soil Types

- 108, ANAHEIM CLAY LOAM 15 TO 30 PERCENT SLOPES
- 109, ANAHEIM CLAY LOAM 30 TO 50 PERCENT SLOPES
- 113, BALCOM CLAY LOAM 30 TO 50 PERCENT SLOPES
- 115, BEACHES
- 134, CALLEGUAS CLAY LOAM 50 TO 75 PERCENT SLOPES - ERODED
- 142, CIENEBA SANDY LOAM 30 TO 75 PERCENT SLOPES - ERODED
- 162, MARINA LOAMY SAND 2 TO 9 PERCENT SLOPES
- 179, MYFORD SANDY LOAM THICK SURFACE 2 TO 9 PERCENT SLOPES
- 196, SAN EMIGDIO FINE SANDY LOAM MODERATELY FINE SUBSTRATUM 0 TO 2 PERCENT SLOPES
- 207, SORRENTO LOAM 2 TO 9 PERCENT SLOPES
- 211, TIDAL FLATS

162

113

196

207

179

109



SOURCE: Google Imagery, 2015; County of Orange.

FIGURE 7
Soils Map

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Big Canyon Nature Park

Resource and Recreation Management Plan

2.2.3 Climate

The climate within the BCNP area is Mediterranean and characterized by warm, dry summers and wetter winters. Precipitation typically occurs between December and March. The prevailing wind is an onshore flow with offshore, fall Santa Ana winds from the northeast that may gust to 50 miles per hour or higher inland from this location. Because the BCNP is adjacent to the Pacific Ocean, it typically exhibits higher humidity and subsequently higher vegetation moisture content than would be found inland. From a fire hazard perspective, the local climate contributes significantly to fire risk as drying vegetation during the summer months (lower fuel moisture) may serve as available fuel to advancing flames if ignition occurs.

2.2.4 Hydrology

Big Canyon Creek occurs within the Santa Ana River Hydrologic Unit (HU 801.0), Lower Santa Ana River Hydrologic Area (HA 801.1), and more specifically, the East Coastal Plan Hydrologic Sub-Area (HSA 801.11). The East Coastal Plan HSA encompasses approximately 302 square miles and includes the Newport Bay (154 square miles) and Newport Coast (11 square miles) watersheds. Big Canyon is one of the numerous drainages that contribute freshwater flows to the Newport Bay watershed.

Big Canyon's contributing watershed encompasses approximately 1,300 acres (2 square miles) that is primarily characterized as developed. Approximately 96% of the watershed consists of residential, commercial, recreational (golf course, sports parks), cemetery, and other urban land covers. Previous hydrologic analyses have organized the watershed into three segments (WRC 2007):

- Upper – headwaters to MacArthur Boulevard
- Middle – MacArthur Boulevard to Jamboree Road
- Lower – Jamboree Road to Upper Newport Bay

The upper and middle segments of the urban watershed are drained by Big Canyon Creek and its two unnamed tributaries, which have been organized into a North Branch, a Middle Branch (Big Canyon Creek mainstem), and a South branch (Reeder 2011) described further below.

- South Branch – originates near Big Canyon Reservoir and continues northwest through the Harbor View Nature Park and into the Big Canyon Country Club golf course.
- Middle Branch – originates near the base of Spyglass Hill and continues northwest both aboveground and underground before merging with the South Branch just east of the Big Canyon Country Club golf course.

Big Canyon Nature Park Resource and Recreation Management Plan

- North Branch – originates from residential storm drains and the Bonita Canyon Sports Park located northeast of the golf course. The drainage continues along the northern portion of the golf course before merging with the Middle Branch at Jamboree Road.

The three drainages merge within the Big Canyon Country Club Golf Course and then exit through a 10-foot diameter culvert under Jamboree Road before entering the lower watershed, which includes Big Canyon Nature Park and the Upper Newport Bay. Within the lower watershed, Big Canyon Creek is an unlined, natural drainage feature that meanders through a narrow canyon before splitting into two subchannels that drain into Newport Bay.

Historic topographic maps and accounts indicate that Big Canyon Creek was an ephemeral drainage that only supported flow following rainfall periods, and did not contain perennial reaches or springs (Reeder 2011). Development within the upper and middle watershed began in late 1960s and by the early 1980s most of the area was developed. Construction of residential and recreational land covers surrounding the headwater system and adjacent banks, as well as the presence of several concrete storm drain outlets currently provide supplemental surface water to Big Canyon.

Currently, dry season surface water flows within BCNP are generally less than 1 cubic foot per second (Reeder 2011). Big Canyon drains into the Upper Newport Bay through three, 15-inch pipes under Back Bay Drive. Tidal inundation in the Study Area is limited to the bayside of Back Bay Drive and has been since the mid-1900s with construction of the road and placement of dredged materials from Upper Newport Bay (WRC 2007). In the early-1980s, a fresh water pond was constructed just east of Back Bay Drive. Over the years, the pond has filled in with sediment and is currently a shallow depression that support dense herbaceous vegetation.

Groundwater occurs from 2 to 10 feet below ground surface throughout the Study Area. Groundwater depth varies along Back Bay Drive due to tidal influences and may exceed 10 feet in some areas due to higher surface elevations of historic fill (WRC 2007). The amount of groundwater in the BCNP is due to increased infiltration into the surrounding soils from anthropogenic sources of water that have low flow rates (WRC 2007).

2.3 Biological Resources

This section contains the general biological resources of the BCNP in terms of plant communities, floral diversity, wildlife diversity, and wildlife corridors occurring or potentially occurring within the Study Area. The information contained within this section is based on detailed biological resource surveys conducted in 2003 (CCI 2004), 2007 (WRC 2007), and 2015 (Dudek 2015).

Big Canyon Nature Park Resource and Recreation Management Plan

2.3.1 Vegetation Communities

A total of 20 vegetation communities and 8 land covers are present within the Study Area. Dudek used the CDFW’s *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFG 2009) and *List of Vegetation Alliances and Associations*, also referred to as the Natural Communities List (CDFG 2010), to unify the previous mapping classifications and create an updated, comprehensive resource to map the entire Study Area. Detailed descriptions of the vegetation communities and land covers are provided below. Descriptions of the vegetation communities and land covers are organized into three life forms (forest and woodland, shrubland, and herbaceous), referred to as formation classes, as recognized by the CDFW (CDFG 2010) and a fourth category, non-natural land covers/unvegetated communities, and then by formation. Within each formation, the alliances and associations are organized alphabetically followed by mapping units. Unless noted otherwise, the vegetation alliance and associations are included in the Natural Communities List (CDFG 2010).

The 20 vegetation communities are similar to those in the Central-Coastal NCCP/HCP EIR/EIS database, which is based on the Orange County Habitat Classification System (Jones and Stokes 1993; Gray and Bramlet 1992). Additionally, Dudek reviewed and incorporated vegetation community classifications for Big Canyon provided by NCC (NROC 2015). Adjustments were made to rectify polygon shapes and sizes, and the naming convention based on the more recent classification standard developed by the CDFW.

Table 1 summarizes the extent of each community or land cover within the Study Area. A map depicting their distribution within the Study Area is provided in Exhibit A. Representative on-site photographs of vegetation communities are provided in Figures 8 and 9.

**Table 1
Vegetation Communities and Land Covers**

Formation or Generalized Habitat Type	Vegetation Community (CDFW 2010)/ Land Cover Name	Map Label	Acres
<i>Forest and Woodlands Alliances and Stands</i>			4.54
Cool Temperate Forest – Introduced	Pepper Tree or Myoporum Groves Semi-Natural Stands	PTMG	4.54
<i>Cool Temperate Forest – Introduced Subtotal</i>			4.54
<i>Shrubland Alliances and Stands</i>			35.80
Coastal Scrub	California Brittle Bush Alliance	BBS	0.43
	California Brittle Bush-California Sagebrush Association	BBCS	6.02
	California Brittle Bush Disturbed Mapping Unit	dBBS	0.73

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 1
Vegetation Communities and Land Covers**

Formation or Generalized Habitat Type	Vegetation Community (CDFW 2010)/ Land Cover Name	Map Label	Acres
	California Sagebrush Alliance	SBS	3.05
	California Sagebrush-Fourwing Saltbush Disturbed Mapping Unit	dSBFS	0.52
	California Sagebrush Disturbed Mapping Unit	dSBS	0.87
	Coyote Brush-California Sagebrush Association	CBCS	5.45
	Fourwing Saltbush Alliance	FOSA	0.24
	Fourwing Saltbush Disturbed Mapping Unit	dFOSA	2.49
	Lemonade Berry Alliance	LBS	0.74
<i>Coastal Scrub Subtotal</i>			20.54
Riparian Scrub	Arroyo Willow Disturbed Mapping Unit	dAWRF	15.26
<i>Riparian Scrub Subtotal</i>			15.26
<i>Herbaceous Alliances and Stands</i>			18.16
Alkali-Saline Wetlands	Alkali Heath Marsh Alliance	ALHE	0.71
	California Cordgrass Marsh Alliance	CCM	1.77
	Pickleweed Mats Alliance	PIWE	4.27
	Quailbush Alliance	QUBR	0.84
	Salt Grass-Marsh Jaumea Association	SGMJ	0.32
<i>Alkali-Saline Wetlands Subtotal</i>			7.90
Annual Grassland	Upland Mustards Semi-Natural Stands	NNG	4.91
<i>Annual Grassland Subtotal</i>			4.91
Fresh Emergent Wetland	California Bulrush Marsh Alliance	CBM	1.38
	Cattail Marshes Alliance	FWM	3.97
<i>Fresh Emergent Wetland Subtotal</i>			5.35
<i>Non-Natural Land Covers/Unvegetated Communities</i>			29.36
Developed	Disturbed or Barren Mapping Unit	DIST	2.74
	Ornamental Landscaping Mapping Unit	ORN	9.89
	Other Developed Areas Mapping Unit	OTDE	0.48
	Transportation Mapping Unit	TRANS	3.12
	Urban and Commercial Mapping Unit	URBAN	9.39
<i>Developed Subtotal</i>			25.62
Intertidal Flat	Intertidal Mudflat Mapping Unit	INMU	2.20
	Salt Panne Mapping Unit	SAPA	0.42
<i>Intertidal Flat Subtotal</i>			2.62
Water	Open Water Mapping Unit	OW	1.11
<i>Water Subtotal</i>			1.11
Grand Total			87.85

Big Canyon Nature Park Resource and Recreation Management Plan

Forest and Woodlands Alliances and Stands

Cool Temperate Forest – Introduced

Pepper Tree or Myoporum Groves Semi-Natural Stands

The pepper tree or myoporum groves semi-natural stands (*Schinus [molle, terebinthifolius]*-*Myoporum laetum* semi-natural woodland stands) includes Peruvian pepper tree (*Schinus molle*) and/or Brazilian pepper tree (*Schinus terebinthifolius*) that dominate or co-dominate the tree canopy with myoporum (*Myoporum laetum*). The tree layer forms an open to intermittent canopy typically greater than 54 feet (18 meters) in height with an understory of shrubs that are infrequent to common. The herbaceous layer is simple to diverse.

Shrubland Alliances and Stands

Coastal Scrub

California Brittle Bush Scrub Alliance

The California brittle bush scrub alliance (*Encelia californica* scrub alliance) includes California brittle bush (*Encelia californica*) as the dominant or co-dominant shrub in the canopy. California sagebrush (*Artemisia californica*) occasionally may be dominant when California brittle bush has at least 5% cover. Stands of California brittle bush shrubland form an intermittent to continuous shrub layer that is less than 6 feet (2 meters) with variable herbaceous layer (Sawyer et al. 2009). One mapping unit and one association within this alliance were mapped within the Study Area and are described below.

California Brittle Bush-California Sagebrush Association

The California brittle bush-California sagebrush association (*Encelia californica*–*Artemisia californica* association) typically includes California brittle bush as the dominant shrub with California sagebrush consistently present as a co-dominant or sub-dominant shrub.

California Brittle Bush Disturbed Mapping Unit

The California brittle bush disturbance mapping unit is not recognized by the Natural Communities List (CDFG 2010). This mapping unit was used to differentiate areas dominated by California brittle bush, but characterized by areas of disturbance.

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California Sagebrush Scrub Alliance

The California sagebrush scrub alliance (*Artemisia californica* scrub alliance) includes California sagebrush as the dominant or co-dominant shrub in the canopy. This alliance has a continuous or intermittent shrub canopy less than 7 feet (2 meters) in height with a variable ground layer (Sawyer et al. 2009). Species associated with the alliance include black sage (*Salvia mellifera*), white sage (*Salvia apiana*), California brittle bush, chaparral yucca (*Hesperoyucca whipplei*), Menzies's goldenbush (*Isocoma menziesii* [*Isocoma veneta*]), coyote brush (*Baccharis pilularis*), common deerweed (*Acmispon glaber*), and poison oak (*Toxicodendron diversilobum*) (Sawyer et al. 2009). Two mapping units within this alliance was mapped within the Study Area and are described below: California sagebrush disturbed mapping unit and California sagebrush-fourwing saltbush disturbed mapping unit.

California Sagebrush Disturbed Mapping Unit

The California sagebrush disturbance mapping unit is not recognized by the Natural Communities List (CDFG 2010). This mapping unit was used to differentiate areas dominated by California sagebrush, but characterized by areas of disturbance.

California Sagebrush-Fourwing Saltbush Disturbed Mapping Unit

The California sagebrush -fourwing saltbush disturbed mapping unit is not recognized by the Natural Communities List (CDFG 2010). This mapping unit includes California sagebrush and fourwing saltbush (*Atriplex canescens*) as co-dominants. This mapping unit was used to differentiate areas dominated by California sagebrush and fourwing saltbush, but characterized by areas of disturbance.

Coyote Brush–California Sagebrush Association

The coyote brush–California sagebrush association (*Baccharis pilularis*–*Artemisia californica* association) typically includes coyote brush as the dominant shrub with California sagebrush consistently present as a co-dominant or sub-dominant shrub. The shrub layer has a variable canopy less than 10 feet (3 meters) in height with a variable herbaceous layer (Sawyer et al. 2009).

Fourwing Saltbush Alliance

The fourwing saltbush alliance (*Atriplex canescens* shrubland alliance) includes fourwing saltbush as the dominant or co-dominant shrub in the canopy. This alliance has an open or intermittent shrub canopy less than 9 feet (3 meters) in height with a variable ground layer (Sawyer et al. 2009). A low cover of emergent mesquite (*Prosopis glandulosa*) trees may be

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present. Species associated with the alliance include burrobrush (*Ambrosia dumosa*), cheesebush (*Ambrosia salsola*), shadescale (*Atriplex confertifolia*), allscale (*Atriplex polycarpa*), yellow rabbitbrush (*Chrysothamnus viscidiflorus*), bush seepweed (*Suaedanigra*) (Sawyer et al. 2009). One mapping unit within this alliance was mapped within the Study Area and is described below: Fourwing saltbush disturbed mapping unit.

Fourwing Saltbush Disturbed Mapping Unit

The fourwing saltbush disturbance mapping unit is not recognized by the Natural Communities List (CDFG 2010). This mapping unit was used to differentiate areas dominated by fourwing saltbush, but characterized by areas of disturbance.

Lemonade Berry Alliance

The lemonade berry alliance (*Rhus integrifolia* scrub alliance) includes lemonade berry (*Rhus integrifolia*) as the dominant or co-dominant shrub in the canopy. This alliance has an open to continuous shrub canopy less than 15 feet (5 meters) in height and two tiered. The herbaceous layer is open (Sawyer et al. 2009). A sparse cover of emergent trees may be present such as California walnut (*Juglans californica*), coast live oak (*Quercus agrifolia*), Torrey pine (*Pinus torreyana*), and Peruvian pepper tree. Species associated with the alliance include California sagebrush, California brittle bush, California buckwheat (*Eriogonum fasciculatum*), chaparral yucca, toyon (*Heteromeles arbutifolia*), laurel sumac (*Malosma laurina*), cactus (*Opuntia* spp.), purple sage (*Salvia leucophylla*), black sage, and blue elderberry (*Sambucus nigra*) (Sawyer et al. 2009).

Riparian Scrub

Arroyo Willow Thickets Alliance

The arroyo willow thickets alliance (*Salix lasiolepis* thickets alliance) includes arroyo willow (*Salix lasiolepis*) as the dominant or co-dominant tree in the canopy. The alliance has an open to continuous tree canopy less than 65 feet (20 meters) in height with an open to intermittent shrub canopy and a variable ground layer (Sawyer et al. 2009). Species associated with the alliance include white alder (*Alnus rhombifolia*), coyote brush, mulefat (*Baccharis salicifolia*), California sycamore (*Platanus racemosa*), Fremont cottonwood (*Populus fremontii*), blue elderberry, and other willows (Sawyer et al. 2009). One mapping unit within this alliance was mapped within the Study Area and described below: arroyo willow disturbed mapping unit.

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Arroyo Willow Disturbed Mapping Unit

The arroyo willow disturbance mapping unit is not recognized by the Natural Communities List (CDFG 2010). This mapping unit was used to differentiate areas dominated by arroyo willow, but characterized by areas of disturbance.

Herbaceous Alliances and Stands

Alkali-Saline Wetland

Alkali Heath Marsh Alliance

The alkali heath marsh alliance (*Frankenia salina* herbaceous alliance) includes alkali heath (*Frankenia salina*) as the dominant or co-dominant in the herbaceous and subshrub layer. The alliance has an open to continuous layer that is less than 2 feet (60 centimeters) in height (Sawyer et al. 2009). Species associated with the alliance include Parish's glasswort (*Arthrocnemum subterminale*), *Atriplex* spp., Pacific bentgrass (*Agrostis avenacea*), turtle weed (*Batis maritima*), alkali weed (*Cressa truxillensis*), salt grass (*Distichlis spicata*), mouse barley (*Hordeum murinum*), goldfields (*Lasthenia* spp.), pepper weed (*Lepidium* spp.), marsh rosemary (*Limonium californicum*), shoregrass (*Monanthochloe littoralis*), pickleweed (*Sarcocornia pacifica*), and woolly seablite (*Suaeda taxifolia*) (Sawyer et al. 2009).

California Cordgrass Marsh Alliance

The California cordgrass alliance (*Spartina foliosa* herbaceous alliance) includes California cordgrass (*Spartina foliosa*) as the dominant and co-dominant in the herbaceous layer. The alliance has an intermittent to continuous layer that is less than 4.5 feet (1.5 meters) in height (Sawyer et al. 2009). Species associated with the alliance as co-dominants include turtle weed, pickleweed, and California bulrush (*Schoenoplectus californicus*) (Sawyer et al. 2009).

Pickleweed Mats Alliance

The pickleweed mats alliance (*Sarcocornia pacifica* herbaceous alliance) includes pickleweed as the dominant or co-dominant in the subshrub and herbaceous layer. The alliance has an intermittent to continuous layer that is less than 4.5 feet (1.5 meters) in height (Sawyer et al. 2009). Species associated with the alliance and/or as co-dominants include halberd-leaved saltbush (*Atriplex patula*), turtle weed, alkali bulrush (*Bolboschoenus maritimus*), African brass-buttons (*Cotula coronopifolia*), swamp timothy (*Crypsis schoenoides*), pickleweed dodder (*Cuscuta salina*), salt grass, barnyard grass (*Echinochloa crus-galli*), alkali heath, fleshy jaumea (*Jaumea carnosa*), *Juncus* spp., pepper weed, (*Limonium californicum*), salt cedar

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(*Monanthochloe littoralis*), willow smartweed (*Persicaria lapathifolia* [*Polygonum lapathifolium*]), western sea-purslane (*Sesuvium verrucosum*), California cord grass (*Spartina foliosa*), seablite (*Suaeda esteroa*), woolly seablite, arrowgrass (*Triglochin maritima*), cocklebur (*Xanthium strumarium*), and algae (Sawyer et al. 2009).

Quailbush Alliance

The quailbush alliance (*Atriplex lentiformis* shrubland alliance) includes quailbush (*Atriplex lentiformis*) as the dominant species in the shrub layer. The alliance has an open to intermittent layer that is less than 15 feet (5 meters) in height and a variable herbaceous layer (Sawyer et al. 2009). Species associated with the alliance include California sagebrush, fourwing saltbush, coyote brush, mulefat, California brittle bush, laurel sumac, myoporum, arrowweed (*Pluchea sericea*), lemonadeberry, alkali dropseed (*Sporobolus airoides*), woolly seablite, and *Tamarix* spp. (Sawyer et al. 2009).

Salt Grass Alliance

The salt grass alliance (*Distichlis spicata* herbaceous alliance) includes salt grass as the dominant or co-dominant species in herbaceous layer. The alliance has an open to continuous canopy that is less than 3 feet (1 meter) in height. Species associated with the alliance include water bentgrass (*Agrostis viridis*), beach burweed (*Ambrosia chamissonis*), yerba mansa (*Anemopsis californica*), turtle weed, riggut grass (*Bromus diandrus*), African brass-buttons, pale spike-rush (*Eleocharis palustris*), alkali heath, California barley (*Hordeum brachyantherum*), mouse barley, fleshy jaumea, pepperweed, pickleweed, and alkali dropseed (Sawyer et al. 2009).

Salt Grass-Marsh Jaumea Association

The salt grass-marsh jaumea association (*Distichlis spicata*-*Jaumea carnosa* association) typically includes salt grass as the dominant shrub with marsh (fleshy) jaumea consistently present as a co-dominant or sub-dominant herb.

Annual Grassland

Upland Mustards Semi-Natural Stands

The upland mustards semi-natural stands (*Brassica (nigra)* and other mustards semi-natural stands) is usually characterized by weedy, upland mustard species and is often associated with agriculture, but also found in wildland settings (Sawyer et al. 2009). This semi-natural stand is dominated by black mustard, field mustard (*Brassica rapa*), Asian mustard (*Brassica tournefortii*), shortpod mustard,

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Dyer's woad (*Isatis tinctoria*), and/or cultivated radish (*Raphanus sativus*) and has an open to continuous herbaceous canopy less than 10 feet (3 meters) in height (Sawyer et al. 2009).

Fresh Emergent Wetland

California Bulrush Marsh Alliance

The California bulrush marsh alliance (*Schoenoplectus californicus* herbaceous alliance) includes California bulrush as the dominant or co-dominant in the herbaceous layer. The alliance has an intermittent to continuous layer that is less than 12 feet (4 meters) in height (Sawyer et al. 2009). Species associated with the alliance and/or as co-dominants include Indian hemp (*Apocynum cannabinum*), alkali bulrush, water hyacinth (*Eichhornia crassipes*), western goldenrod (*Euthamia occidentalis*), yellow waterweed (*Ludwigia peploides*), hardstem bulrush (*Schoenoplectus acutus*), narrow-leaved cattail (*Typha angustifolia*), slender cattail (*Typha domingensis*), and broad-leaved cattail (*Typha latifolia*) (Sawyer et al. 2009).

Cattail Marshes Alliance

The cattail marshes alliance (*Typha* [*angustifolia*, *domingensis*, *latifolia*] herbaceous alliance) includes narrow-leaved cattail, slender cattail, or broad-leaved cattail as the dominant or co-dominant in the herbaceous layer. The alliance has an intermittent to continuous layer that is less than 4.5 feet (1.5 meters) in height (Sawyer et al. 2009). Species associated with the alliance include creeping bentgrass (*Agrostis stolonifera*), sedges (*Cyperus* spp.), salt grass, barnyard grass, pale spike-rush, rushes (*Juncus* spp.), duckweed (*Lemna minuta*), pepperweed, water parsley (*Oenanthe sarmentosa*), willow smartweed, chairmaker's bulrush (*Schoenoplectus americanus*), California bulrush (*Schoenoplectus californicus*), and cocklebur. Emergent trees may be present at low cover, including willows (*Salix* spp.).

Non-Natural Land Covers/Unvegetated Communities

Developed

Disturbed or Barren Mapping Unit

The disturbed or barren mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Jones & Stokes (1993). The disturbed or barren mapping unit, also identified by Gray and Bramlet as cleared or graded, refers to areas that lack vegetation but still retain a pervious surface, or that are dominated by a sparse cover of ruderal vegetation such as Maltese star-thistle, wild oat, black mustard, spiny sowthistle (*Sonchus asper*), and prickly lettuce (*Lactuca serriola*).

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Ornamental Landscaping Mapping Unit

The ornamental landscaping mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Jones & Stokes (1993). This land cover type, also identified by Gray and Bramlet (1992) as parks and ornamental plantings, consists of introduced plantings of exotic, and sometimes native, species as landscaping that are actively maintained.

Other Developed Areas Mapping Unit

The other developed areas mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Jones & Stokes (1993). The other developed areas mapping unit, also identified by Gray and Bramlet (1992) as other developed areas, describes areas occupied by structures, paving, and other impermeable surfaces that typically do not support vegetation or habitat for species.

Transportation Mapping Unit

The transportation mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Jones & Stokes (1993) and Gray and Bramlet (1992). This barren cover type consists of major paved vehicular access roads that lack vegetation.

Urban and Commercial Mapping Unit

The urban and commercial mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Jones & Stokes (1993). The urban and commercial mapping unit, also identified by Gray and Bramlet (1992) as urban, describes areas occupied by residential and commercial structures, paving, and other impermeable surfaces that typically do not support vegetation or habitat for species; however, non-native ornamental landscaping may occur within the mapping unit.

Water

Open Water Mapping Unit

The open water mapping unit is not recognized by the Natural Communities List (CDFG 2010) but is described by Jones & Stokes (1993). Open water consists of standing water with no emergent vegetation. Open water is not considered a riparian habitat because it lacks hydrophytic vegetation. Open water can be regulated by CDFW, pursuant to Section 1602 of the California Fish and Game Code, and the U.S. Army Corps of Engineers, pursuant to Section 404 of the federal Clean Water Act (33 U.S.C. 1251 et seq.).

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Intertidal Flat

Intertidal Mudflat Mapping Unit

The intertidal mudflat mapping unit is not recognized by the Natural Communities List (CDFG 2010), but is described by Jones & Stokes (1993). Intertidal mudflats consist of periodically exposed areas of estuarine silts, clays, and marine wildlife detritus. These areas are submerged and exposed approximately twice daily and generally do not support vascular plants.

Salt Panne Mapping Unit

The salt panne mapping unit is not recognized by the Natural Communities List (CDFG 2010). Salt pannes consist of historically inundated depressional areas within estuarine systems that have dried to form exposed, hyperaline soils with a salt crust surface. These unique microhabitats may support various species of halophytes and benthic plants along the higher elevation perimeter of the depressional area.

2.3.2 Floral Diversity

Detailed biological studies to document the floral diversity within Big Canyon have been conducted since 2003 to evaluate restoration opportunities. Additional focused botanical surveys were conducted in June and July 2015 (Roberts 2015). Sixty-four (64) plant taxa were observed within BCNP during the 2015 surveys: 32 (50%) native species and 32 (50%) non-native species. A complete list of all vascular plants observed from all surveys conducted to-date within the BCNP is included as Appendix B, Plant Species within the BCNP. Plant species richness is relatively high due to the variety of plant communities within the BCNP rather than a high diversity within a particular community. Few annual plant species were detected in the riparian forest and coastal scrub, for example because of the generally dense shrub cover.

Table 2 lists a total of 49 special-status plant species that are listed as either Covered, Conditionally Covered, or Non-Covered under the Central-Coastal Subregion NCCP/HCP, are known to occur within a 5-mile radius of the project site (CDFW 2015), or have the potential to occur based on vegetation communities present on site (see Appendix C for species sensitivity categories). For each species listed in Table 2, a determination was made regarding the potential for the species to occur on site based on information gathered during previous field reconnaissance surveys, including the location of the site, habitats present, current site conditions, past and present land use and a review of known locations based on the CNDDDB (CDFW 2015).



Photo 1: Coastal scrub communities (central southern portion) looking south-east. (June 2015)



Photo 2: Coastal scrub communities (western portion) along Back Bay Drive looking north. (June 2015)

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Photo 3: Riparian scrub, fresh emergent wetland, annual grassland and coastal scrub communities (western portion) looking southwest. (June 2015)



Photo 4: Annual grassland, riparian scrub, and coastal scrub communities (eastern portion) looking north. (June 2015)

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A number of species listed in Table 2, including small-flowered mountain mahogany (*Cercocarpus minutiflora*), Tecate cypress (*Cupressus forbesii*), heart-leaved pitcher sage (*Lepechinia cardiophylla*), Nuttall's scrub oak (*Quercus dumosa*), summery holly (*Comarostaphylis diversifolia* ssp. *diversifolia*), and southern California black walnut (*Juglans californica*) are conspicuous (i.e., large, woody shrubs) and would have been observed on site if present. Unless observed during the reconnaissance survey, it is assumed that such conspicuous and readily observed species are not present on site. In addition, the presence or absence of certain species of perennial herbs can reliably be determined by observation of vegetative structures that are detectable year-round (i.e., outside of their respective blooming periods).

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**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
Catalina mariposa lily	<i>Calochortus catalinae</i>	None/ None	4.2	Covered	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland/ perennial bulbiferous herb/ (Feb),Mar-Jun/ 49-2297	Low potential to occur. It was not observed during vegetation mapping. In addition, Cal flora describes the distribution of Catalina mariposa lily on the island of Catalina, much further north of the site and much further south.
Coulter's matilija poppy	<i>Romneya coulteri</i>	None/ None	4.2	Covered	Chaparral, Coastal scrub/Often in burns/ perennial rhizomatous herb/ Mar-Jul/ 66-3937	Low potential to occur. This perennial herb would have likely been observed during vegetation mapping. Although suitable habitat occurs within the Study Area, the best places for this species were more disturbed. In addition, Calflora describes Coulter's poppy distribution much further east of the Study Area.
heart-leaved pitcher sage	<i>Lepechinia cardiophylla</i>	None/ None	1B.2	Covered	Closed-cone coniferous forest, Chaparral, Cismontane woodland/ perennial shrub/ Apr-Jul/ 1706-4495	Not expected to occur. The site is outside of the species' known elevation range and there is no suitable vegetation present.
intermediate (foothill) mariposa lily	<i>Calochortus weedii</i> var. <i>intermedius</i>	None/ None	1B.2	Conditionally Covered	Chaparral, Coastal scrub, Valley and foothill grassland/rocky, calcareous/ perennial bulbiferous herb/ May-Jul/ 344-2805	Low potential to occur. It was not observed during vegetation mapping. In addition, Cal flora describes the distribution of intermediate mariposa lily much further south of the Study Area.

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**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
Laguna Beach dudleya	<i>Dudleya stolonifera</i>	FT/ CT	1B.1	Covered	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland/rocky/ perennial stoloniferous herb/ May-Jul/ 33-853	Low potential to occur. Suitable habitat exists, but soil type does not. There are no recent occurrences or records of the species within the vicinity of the Study Area. According to Calflora, the distribution of this stoloniferous herb is further south.
Nuttall's scrub oak	<i>Quercus dumosa</i>	None/ None	1B.1	Covered	Closed-cone coniferous forest, Chaparral, Coastal scrub/sandy, clay loam/ perennial evergreen shrub/ Feb-Apr(Aug)/ 49-1312	Low potential to occur. This perennial shrub would have been observed during vegetation mapping. In addition, Calflora has described the distribution much further south of the Study Area.
Santa Monica dudleya	<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>	FT/ None	1B.1	Covered	Chaparral, Coastal scrub/volcanic or sedimentary, rocky/ perennial herb/ Mar-Jun/ 492-5495	Not expected to occur. The site is outside the species' known elevation range.
small-flowered mountain mahogany	<i>Cercocarpus minutifolia</i>	None/ None	4.2	Covered	Chaparral, cismontane woodland, CSS, valley and foothill grassland/ perennial herb/ February–May	Not expected to occur.
Tecate cypress	<i>Hesperocyparis forbesii</i>	None/ None	1B.1	Covered	Closed-cone coniferous forest, Chaparral/clay, gabbroic or metavolcanic/ perennial evergreen tree/ N.A./ 262-4921	Not expected to occur. This species would have been observed during vegetation mapping. This Study Area is outside the known elevation range of tecate cypress.

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**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
Allen's pentachaeta	<i>Pentachaeta aurea</i> <i>ssp. allenii</i>	None/ None	1B.1	None	Coastal scrub(openings), Valley and foothill grassland/ annual herb/ Mar-Jun/ 246-1706	Low potential to occur. Minimal suitable habitat is present within the Study Area. Calflora has mapped the distribution of this annual herb much further east of the Study Area near Laguna coast wilderness park.
aphanisma	<i>Aphanisma blitoides</i>	None/ None	1B.2	None	Coastal bluff scrub, Coastal dunes, Coastal scrub/sandy/ annual herb/ Mar-Jun/ 3-1001	High potential to occur. Aphanisma was not observed during vegetation mapping but high quality habitat persists within the Study Area. Aphanisma is found on coastal bluffs, beach dunes and coastal bluff scrub which is primarily what the Study Area consists of. Myford and Cieneba sandy loams are soils that Aphanisma utilizes. Associates of Aphanisma include Atriplex californica. Numerous Atriplex species were observed on site. In addition, Cal flora has mapped Aphanisma near the Study Area. Reiser has also stated Newport back bay is a primary location for this extremely rare plant species.

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**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
big-leaved crownbeard	<i>Verbesina dissita</i>	FT/ CT	1B.1	None	Chaparral(maritime), Coastal scrub/ perennial herb/ Apr-Jul/ 148-673	Low potential to occur. Big leaved crown beard would likely have been observed during vegetation mapping. In addition, Calflora has described the distribution much further south of the Study Area near Laguna Beach.
Blochman's dudleya	<i>Dudleya blochmaniae</i> ssp. <i>blochmaniae</i>	None/ None	1B.1	None	Coastal bluff scrub, Chaparral, Coastal scrub, Valley and foothill grassland/rocky, often clay or serpentinite/ perennial herb/ Apr-Jun/ 16-1476	Low potential to occur. Blochman's dudleya occurs in clay or serpentinite soils. Areas with clay soils on site were disturbed with non-native species making growth of Blochman's dudleya unlikely. In addition, Calflora has mapped the closest population of Blochman's dudleya near Dana point.
Brand's star phacelia	<i>Phacelia stellaris</i>	FC/ None	1B.1	None	Coastal dunes, Coastal scrub/ annual herb/ Mar-Jun/ 3-1312	Low potential to occur. Brand's star phacelia has a historical distribution near Cypress, Ca which is the closest location near the Study Area. In Los Angeles, this species once thrived on pre-fladrian stabilized dunes situated behind active ack dunes on the beach (Reiser 2001). According to Calflora most of the plants left in this population occur on the San Diego county coastline.

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**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
California box thorn	<i>Lycium californicum</i>	None/ None	4.2	None	Coastal sage scrub/Coastal bluffs	Observed in the north and west sections of the site.
California Orcutt grass	<i>Orcuttia californica</i>	FE/ CE	1B.1	None	Vernal pools/ annual herb/ Apr-Aug/ 49-2165	Not expected to occur. No suitable vegetation is present. California Orcutt grass is associated with vernal pools which were not found within the Study Area during vegetation mapping. .
chaparral ragwort	<i>Senecio aphanactis</i>	None/ None	2B.2	None	Chaparral, Cismontane woodland, Coastal scrub/sometimes alkaline/ annual herb/ Jan-Apr/ 49-2625	Low potential to occur. Areas of potential habitat were somewhat disturbed by non-native species. In addition, Calflora has mapped the closest population near the University of California Irvine in an ecological preserve.
chaparral sand-verbena	<i>Abronia villosa</i> var. <i>aurita</i>	None/ None	1B.1	None	Chaparral, Coastal scrub, Desert dunes/sandy/ annual herb/ Jan-Sep/ 246-5249	Moderate potential to occur. Chaparral sand verbena was not observed during vegetation mapping surveys but high quality habitat persists within the Study Area. This annual grows in sandy soils and sandy floodplains. Sandy soils were found within the Study Area. In addition, Calflora has mapped this plant near the Study Area.

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**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
cliff spurge	<i>Euphorbia misera</i>	None/ None	2B.2	None	Coastal bluff scrub, Coastal scrub, Mojavean desert scrub/rocky/ perennial shrub/ Dec-Aug(Oct)/ 33-1640	Low potential to occur. This species would likely have been observed during vegetation mapping. Suitable habitat and soil is not present. There are no recent occurrences or records of the species within the vicinity of the Study Area.
coast woolly-heads	<i>Nemacaulis denudata</i> var. <i>denudata</i>	None/ None	1B.2	None	Coastal dunes/ annual herb/ Apr-Sep/ 0-328	Low potential to occur. Coastal dunes are not present within the Study Area.
Coulter's goldfields	<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	None/ None	1B.1	None	Marshes and swamps(coastal salt), Playas, Vernal pools/ annual herb/ Feb-Jun/ 3-4003	Low potential to occur. Areas with potential for Coulter's goldfields area too disturbed. In addition, Calflora has one historical record from 1934 much further north east of the Study Area.
Coulter's saltbush	<i>Atriplex coulteri</i>	None/ None	1B.2	None	Coastal bluff scrub, Coastal dunes, Coastal scrub, Valley and foothill grassland/alkaline or clay/ perennial herb/ Mar-Oct/ 10-1509	High potential to occur. Numerous <i>Atriplex</i> species were found during vegetation mapping and high quality habitat exists within the Study Area for Coulter's saltbush. In addition, Cal flora describes the distribution of Coulter's saltbush as being abundant around Newport bay.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
Davidson's saltscale	<i>Atriplex serenana</i> var. <i> davidsonii</i>	None/ None	1B.2	None	Coastal bluff scrub, Coastal scrub/alkaline/ annual herb/ Apr-Oct/ 33-656	High potential to occur. Numerous <i>Atriplex</i> species were found during vegetation mapping and high quality habitat exists within the Study Area for Davidson's saltscale. In addition, Cal flora describes the distribution of Davidson's saltscale as being abundant around Newport bay.
decumbent goldenbush	<i>Isocoma menziesii</i> var. <i> decumbens</i>	None/ None	1B.2	None	Chaparral, Coastal scrub(sandy, often in disturbed areas)/ perennial shrub/ Apr-Nov/ 33-443	Moderate potential to occur. Suitable habitat and soils exist within the Study Area.
estuary seablite	<i>Suaeda esteroa</i>	None/ None	1B.2	None	Marshes and swamps(coastal salt)/ perennial herb/ May-Oct(Jan)/ 0-16	High potential to occur. High quality habitat for this species occurs within the Study Area. In addition, Calflora has mapped the distribution of this species throughout the Study Area.
Gambel's water cress	<i>Nasturtium gambelii</i>	FE/ CT	1B.1	None	Marshes and swamps(freshwater or brackish)/ perennial rhizomatous herb/ Apr-Oct/ 16-1083	Low potential to occur .Minimal suitable habitat occurs within the Study Area. There are no recent occurrences or records of the species within the vicinity of the Study Area.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
Lewis' evening-primrose	<i>Camissoniopsis lewisii</i>	None/ None	3	None	Coastal bluff scrub, Cismontane woodland, Coastal dunes, Coastal scrub, Valley and foothill grassland/sandy or clay/ annual herb/ Mar-May(Jun)/ 0-984	Moderate potential to occur. Lewis's evening primrose grows on very sandy soil near the beach and on beach bluffs. Soils are usually mapped as Chino fine sandy loams (Reiser 2001). This annual is associated with <i>Nemocaulis denudata</i> and <i>Acmispon nuttallianus</i> . In addition, Calflora has mapped this annual near the Study Area both on the coast and off of the bay.
Los Angeles sunflower	<i>Helianthus nuttallii</i> ssp. <i>parishii</i>	None/ None	1A	None	Marshes and swamps(coastal salt and freshwater)/ perennial rhizomatous herb/ Aug-Oct/ 33-5495	Moderate potential to occur. Suitable habitat occurs within the Study Area. In addition, Calflora has mapped this herb near the survey area.
many-stemmed dudleya	<i>Dudleya multicaulis</i>	None/ None	1B.2	None	Chaparral, Coastal scrub, Valley and foothill grassland/often clay/ perennial herb/ Apr-Jul/ 49-2592	High potential to occur. Suitable habitat and soils exist within the Study Area. Occurs nearby in the Upper Newport Bay.
mesa horkelia	<i>Horkelia cuneata</i> var. <i>puberula</i>	None/ None	1B.1	None	Chaparral(maritime), Cismontane woodland, Coastal scrub/sandy or gravelly/ perennial herb/ Feb-Jul(Sep)/ 230-2657	Not expected to occur. The site is outside of the species' known elevation range.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
mud nama	<i>Nama stenocarpum</i>	None/ None	2B.2	None	Marshes and swamps(lake margins, riverbanks)/ annual / perennial herb/ Jan-Jul/ 16-1640	Low potential to occur. Mud nama occurs in the muddy periphery of reservoirs and ponds. No suitable habitat exists within the Study Area. The closest known population is near Laguna coast wilderness park. All other records are historical (CalFlora 2015; Reiser 2001).
Orcutt's pincushion	<i>Chaenactis glabriuscula</i> var. <i>orcuttiana</i>	None/ None	1B.1	None	Coastal bluff scrub(sandy), Coastal dunes/ annual herb/ Jan-Aug/ 0-328	Low potential to occur. Minimal suitable habitat occurs within the Study Area. There are no recent occurrences or records of the species within the vicinity of the Study Area. Calflora has mapped this annual herb much further south, near Laguna Niguel.
Palmer's grapplinghook	<i>Harpagonella palmeri</i>	None/ None	4.2	None	Chaparral, Coastal scrub, Valley and foothill grassland/clay/ annual herb/ Mar-May/ 66-3133	Low potential to occur. This species is more likely to occur in undisturbed native grassland with heavy clay soils. The site doesn't have this habitat.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
Parish's brittlescale	<i>Atriplex parishii</i>	None/ None	1B.1	None	Chenopod scrub, Playas, Vernal pools/alkaline/ annual herb/ Jun-Oct/ 82-6234	Moderate potential to occur. Numerous <i>Atriplex</i> species were found during vegetation mapping and high quality habitat exists within the Study Area for <i>Atriplex</i> species like Parish's brittlescale. In addition, Cal flora describes the distribution of Parish's brittlescale as being historically found in urban areas close to Newport bay.
prostrate vernal pool navarretia	<i>Navarretia prostrata</i>	None/ None	1B.1	None	Coastal scrub, Meadows and seeps, Valley and foothill grassland(alkaline), Vernal pools/Mesic/ annual herb/ Apr-Jul/ 49-3970	Low potential to occur. Prostrate vernal pool navarretia is usually found in vernal pools or very wet seeps. This habitat did not occur within the Study Area. In addition, Calflora has mapped the distribution of this annual herb outside the Newport beach area.
Robinson's pepper-grass	<i>Lepidium virginicum</i> var. <i>robinsonii</i>	None/ None	4.3	None	Chaparral, Coastal scrub/ annual herb/ Jan-Jul/ 3-2904	Moderate potential to occur. Suitable habitat exists within the Study Area.
salt marsh bird's-beak	<i>Chloropyron maritimum</i> ssp. <i>maritimum</i>	FE/ CE	1B.2	None	Coastal dunes, Marshes and swamps(coastal salt)/ annual herb (hemiparasitic)/ May-Oct/ 0-98	Observed in 2010. High potential to occur. Suitable habitat.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
salt spring checkerbloom	<i>Sidalcea neomexicana</i>	None/ None	2B.2	None	Chaparral, Coastal scrub, Lower montane coniferous forest, Mojavean desert scrub, Playas/alkaline, mesic/ perennial herb/ Mar-Jun/ 49-5020	Low potential to occur. Suitable habitat occurs within the Study Area but salt spring checkerbloom is usually seen at higher elevations. In addition, Calflora has this perennial mapped further east of the survey area.
San Bernardino aster	<i>Symphyotrichum defoliatum</i>	None/ None	1B.2	None	Cismontane woodland, Coastal scrub, Lower montane coniferous forest, Meadows and seeps, Marshes and swamps, Valley and foothill grassland(vernally mesic)/near ditches, streams, springs/ perennial rhizomatous herb/ Jul-Nov/ 7-6693	Moderate potential to occur. Suitable habitat occurs within the Study Area and has potential to be found in the coastal scrub found within the Study Area.
San Diego button-celery	<i>Eryngium aristulatum</i> var. <i>parishii</i>	FE/ CE	1B.1	None	Coastal scrub, Valley and foothill grassland, Vernal pools/mesic/ annual / perennial herb/ Apr-Jun/ 66-2034	Low potential to occur. San Diego button celery is usually associated with vernal pools and heavy clay soils which did not occur within the Study Area. There are no recent occurrences or records of the species within the vicinity of the Study Area.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
San Fernando Valley spineflower	<i>Chorizanthe parryi</i> var. <i>fernandina</i>	FC/ CE	1B.1	None	Coastal scrub(sandy), Valley and foothill grassland/ annual herb/ Apr-Jul/ 492-4003	Low potential to occur. Minimal suitable habitat occurs within the Study Area. There are no recent occurrences or records of the species within the vicinity of the Study Area. Calflora has mapped the closest location of San Fernando Valley spineflower near North Tustin.
Sanford's arrowhead	<i>Sagittaria sanfordii</i>	None/ None	1B.2	None	Marshes and swamps(assorted shallow freshwater)/ perennial rhizomatous herb/ May-Oct(Nov)/ 0-2133	Not expected to occur. Suitable habitat does not exist within the Study Area.
Santa Ana River woollystar	<i>Eriastrum densifolium</i> ssp. <i>sanctorum</i>	FE/ CE	1B.1	None	Chaparral, Coastal scrub(alluvial fan)/sandy or gravelly/ perennial herb/ Apr-Sep/ 299-2001	Not expected to occur. The site is outside of the species known elevation range.
south coast branching phacelia	<i>Phacelia ramosissima</i> var. <i>austrolitoralis</i>	None/ None	3.2	None	Chaparral, Coastal dunes, Coastal scrub, Marshes and swamps(coastal salt)/sandy, sometimes rocky/ perennial herb/ Mar-Aug/ 16-984	Moderate potential to occur. Suitable habitat and soils occur within the Study Area. Calflora has its mapped distribution near the Study Area.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
South Coast saltscale	<i>Atriplex pacifica</i>	None/ None	1B.2	None	Coastal bluff scrub, Coastal dunes, Coastal scrub, Playas/ annual herb/ Mar-Oct/ 0-459	High potential to occur. Numerous <i>Atriplex</i> species were found during vegetation mapping and high quality habitat exists within the Study Area for South coast saltscale. In addition, Cal flora describes the distribution of South coast saltscale as being abundant around Newport bay.
southern tarplant	<i>Centromadia parryi</i> ssp. <i>australis</i>	None/ None	1B.1	None	Marshes and swamps(margins), Valley and foothill grassland(vernally mesic), Vernal pools/ annual herb/ May-Nov/ 0-1575	Observed in the middle of the Study Area, near the unpaved roadways.
summer holly	<i>Comarostaphylis diversifolia</i> ssp. <i>diversifolia</i>	None/ None	1B.2	None	Chaparral, Cismontane woodland/ perennial evergreen shrub/ Apr-Jun/ 98-2592	Not expected to occur. No suitable vegetation or soils are present.
Ventura marsh milk-vetch	<i>Astragalus pycnostachyus</i> var. <i>lanosissimus</i>	FE/ CE	1B.1	None	Coastal dunes, Coastal scrub, Marshes and swamps(edges, coastal salt or brackish)/ perennial herb/ Jun-Oct/ 3-115	Low potential to occur. This plant was not observed during vegetation mapping and would likely been seen if it were present. In addition, Cal flora describes the distribution of Ventura Marsh milkvetch closer to Santa Monica.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 2
Special-Status Plant Species Detected or Potentially Occurring within the BCNP**

Common Name	Scientific Name	Status (Federal/State)	CRPR List	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations/ Life Form/ Blooming Period/ Elevation Range (feet)	Status on Site or Potential to Occur
vernal barley	<i>Hordeum intercedens</i>	None/ None	3.2	None	Coastal dunes, Coastal scrub, Valley and foothill grassland(saline flats and depressions), Vernal pools/ annual herb/ Mar-Jun/ 16-3281	Low potential to occur. Vernal barley is often associated with heavy clay soils within vernal pools. No vernal pools with heavy clay soils were found within the Study Area.
western dichondra	<i>Dichondra occidentalis</i>	None/ None	4.2	None	Chaparral, Cismontane woodland, Coastal scrub, Valley and foothill grassland/ perennial rhizomatous herb/ (Jan),Mar-Jul/ 164-1640	Low potential to occur. <i>Dichondra</i> is more likely to be found in chamise chaparral or coastal sage scrub with clay soils. It is many times observed after a fire. <i>Dichondra</i> is found in clay soils like hambright gravelly clay loam which do not occur within the Study Area. <i>Dichondra</i> is associated with <i>Ceanothus verrucosus</i> , <i>Cneoridium dumosum</i> , <i>Arctostaphylos glandulosa</i> ssp. <i>crassifolia</i> . In addition, Calflora has mapped this perennial much further south and north of the Study Area.

Federal Designations

FE: Federally listed as endangered

FT: Federally listed as threatened

FSC: Federal Species of Concern

State Designations

SE: State-listed as endangered

ST: State-listed as threatened

CNPS List: Definitions are provided in Appendix D.

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2.3.3 Wildlife Diversity

Numerous wildlife surveys have been conducted within Big Canyon including focused surveys for special-status species in 2003 to evaluate restoration opportunities (CCI 2004, Chambers 2003, EIP 2003, and WRC 2007). Other efforts to survey and monitor wildlife throughout Newport Bay have been conducted over the past decade. More recently, focused wildlife surveys were conducted in 2015 for 3 salt-marsh dependent species (Zemba 2015), and 4 other special-status bird species including burrowing owl (*Athene cunicularia*), least Bell's vireo (*Vireo belli pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), and coastal California gnatcatcher (Dudek 2015). Sixty-six (66) species of wildlife were observed during general and focused wildlife surveys in 2015. One pair of coastal California gnatcatchers have been consistently observed within the scrub of Big Canyon since 2003. No other federal- or state-listed wildlife species has been detected within the BCNP. Six (6) species of invertebrates, 2 reptiles, 53 birds, and 5 mammals were observed during the 2015 surveys within the BCNP. A complete list of wildlife species observed from all surveys conducted to-date within the BCNP is included as Appendix C.

A total of 24 special-status wildlife species have at least a moderate potential to occur based on the habitat present within the BCNP. Table 3 lists special-status wildlife species that are Covered, Conditionally Covered, or Non-Covered under the Central-Coastal NCCP/HCP, or that are known to occur in the vicinity of the site (CDFW 2015). For each species listed, a determination was made regarding the potential for the species to occur within the BCNP based on information gathered during the field reconnaissance, known habitat preferences, and knowledge of their distributions in the area.

Big Canyon Nature Park Resource and Recreation Management Plan

**Table 3
Special-Status Wildlife Potential to Occur**

Common Name	Scientific Name	Status (Federal / State)	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations	Status on Site or Potential to Occur
<i>Amphibians</i>					
arboreal salamander	<i>Aneides lugubris</i>	None/None	Covered	Chaparral in southern California; valley-foothill hardwood, valley-foothill hardwood-conifer, mixed conifer habitats, Douglas fir and redwood elsewhere	Not expected to occur. No suitable habitat present within this Study Area. There are no arboreal salamanders recorded in the vicinity and non-native predators are present.
arroyo toad	<i>Anaxyrus californicus</i>	FE/ SSC	Conditionally Covered	Semi-arid areas near washes, sandy riverbanks, riparian areas, palm oasis, Joshua tree, mixed chaparral and sagebrush; stream channels for breeding (typically 3rd order); adjacent stream terraces and uplands for foraging and wintering	Not expected to occur. No suitable habitat present within the Study Area. There are no arroyo toads recorded in the vicinity and non-native predators are present.
black-bellied slender salamander	<i>Batrachoseps nigriventris</i>	None/None	Covered	Swales and drainages in open oak, mixed conifer forests, and mixed chaparral with abundant rocks, litter, or woody debris	Not expected to occur. No suitable habitat present within the Study Area. There are no observations in the vicinity and non-native predators are present.
western spadefoot	<i>Spea hammondi</i>	None/ SSC	Covered	Primarily grassland and vernal pools, but also in ephemeral wetlands that persist at least 3 weeks in chaparral, coastal scrub, valley-foothill woodlands, pastures, and other agriculture	Low potential to occur. Minimal suitable habitat present within the Study Area. There are no western spadefoot toads recorded in the vicinity and non-native predators are present.
<i>Reptiles</i>					
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	None/ SSC	Covered	Open areas of sandy soil in valleys, foothills and semi-arid mountains including coastal scrub, chaparral, valley-foothill hardwood, conifer, riparian, pine-cypress, juniper and annual grassland	Not expected to occur. No suitable habitat present.
Coronado Island skink	<i>Plestiodon skiltonianus interparietalis</i>	None/ SSC	Covered	Woodlands, grasslands, pine forests, chaparral; rocky areas near water	Not expected to occur. No suitable habitat present within the Study Area.
green turtle	<i>Chelonia mydas</i>	FT/None	None	Shallow waters of lagoons, bays, estuaries, mangroves, eelgrass and seaweed beds	Not expected to occur. No suitable habitat present.
orangethroat whiptail	<i>Aspidoscelis hyperythra</i>	None/ SSC	Covered	Low-elevation coastal scrub, chaparral, and valley-foothill hardwood	Moderate potential to occur. There is a recent occurrence of the species within the vicinity. There is suitable habitat within the Study Area.
red diamondback rattlesnake	<i>Crotalus ruber</i>	None/ SSC	Covered	Coastal scrub, chaparral, oak and pine woodlands, rocky grasslands, cultivated areas, and desert flats	Not expected to occur. Although suitable habitat is present within the Study Area, there are no recent occurrences within the vicinity of the Study Area. No species of rattle snakes have been observed in Upper Newport Bay in decades and they are unlikely to disperse into the bay without assistance by humans.
rosy boa	<i>Lichanura trivirgata</i>	None/None	Covered	Desert and chaparral habitats with rocky soils in coastal canyons and hillsides, desert canyons, washes and mountains	Not expected to occur. No suitable habitat is present within the Study Area and the Study Area is outside of the species' known geographic range.
San Bernardino ring-necked snake	<i>Diadophis punctatus modestus</i>	None/None	Covered	Moist habitats including wet meadows, rocky hillsides, gardens, farmland grassland, chaparral, mixed conifer forest, and woodland	Not expected to occur. No suitable habitat present.
San Diegan tiger whiptail	<i>Aspidoscelis tigris stejnegeri</i>	None/None	Covered	Open areas in semiarid grasslands, scrublands, and woodlands	Not expected to occur. No suitable habitat present.
western pond turtle	<i>Actinemys marmorata</i>	None/ SSC	None	Slow-moving permanent or intermittent streams, ponds, small lakes, reservoirs with emergent basking sites; adjacent uplands used for nesting and during winter	Low potential to occur. Minimal suitable habitat present. Sightings were common over 25 years ago but a decrease in the quality of habitat has occurred.
<i>Birds</i>					
bank swallow	<i>Riparia riparia</i> (nesting)	None/ ST	None	Nests in riparian, lacustrine and coastal areas with vertical banks, bluffs and cliffs with sandy soils; open country and water during migration	Not expected to nest within the Study Area, but may fly overhead and forage. Additionally, there are no recent nesting records in the vicinity.
Belding's savannah sparrow	<i>Passerculus sandwichensis beldingi</i>	None/ SE	None	Nests and forages in coastal saltmarsh dominated by pickleweed	High potential to occur. Suitable habitat is observed in the Study Area and the species has been observed in Upper Newport Bay. In 2015, the species was detected in saltmarsh habitat west of Back Bay Drive near the mouth of Big Canyon. However, no nesting territories were recorded in Big Canyon in 2015 during formal surveys.

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**Table 3
Special-Status Wildlife Potential to Occur**

Common Name	Scientific Name	Status (Federal / State)	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations	Status on Site or Potential to Occur
black skimmer	<i>Rynchops niger</i> (nesting colony)	BCC/ SSC	None	Nests on barrier beaches, shell banks, spoil islands and saltmarsh; forages over open water; roosts on sandy beaches and gravel bars	Low potential to nest within the Study Area. Minimal suitable habitat is present and there are no recent occurrences within the vicinity.
burrowing owl	<i>Athene cunicularia</i> (burrow sites and some wintering sites)	BCC/ SSC	None	Nests and forages in grassland, open scrub, and agriculture, particularly with ground squirrel burrows.	Low potential to occur. Minimal suitable habitat present within the Study Area. No burrowing owl individuals and/or sign were not observed during surveys conducted for this species in 2015.
California black rail	<i>Laterallus jamaicensis coturniculus</i>	BCC/ ST, FP	None	Tidal marshes, shallow freshwater margins, wet meadows and flooded grassy vegetation; suitable habitats are often supplied by canal leakage in Sierra foothill populations	Moderate potential to occur. Observed in Upper Newport Bay during previous surveys. Suitable habitat is present within the Study Area.
California horned lark	<i>Eremophila alpestris actia</i>	None/ WL	None	Nests and forages in grasslands disturbed lands, agriculture, and beaches; nests in alpine fell fields of the high Sierra	Low potential to occur. Minimal suitable habitat is present and there is one recent occurrence within the vicinity.
California least tern	<i>Sternula antillarum browni</i> (nesting colony)	FE/ SE, FP	None	Forages in shallow estuaries and lagoons; nests on sandy beaches or exposed tidal flat	High potential to nest within the Study Area. Suitable foraging habitat occurs within the Study Area. Observed foraging and nesting in Upper Newport Bay in the past.
coastal cactus wren	<i>Campylorhynchus brunneicapillus sandiegensis</i>	BCC/ SSC	Covered	Southern cactus scrub patches	Low potential to occur. Although recent occurrence records occur within the vicinity of the Study Area, minimal suitable habitat present within the project site.
coastal California gnatcatcher	<i>Polioptila californica californica</i>	FT/ SSC	Covered	Nests and forages in various sage scrub communities, often dominated by California sagebrush and buckwheat; generally avoids nesting in areas with a slope of greater than 40%; majority of nesting at less than 1,000 ft in elevation	Present. Observed within the Study Area. A pair was observed within coastal scrub habitat along the southern end of the Study Area during protocol surveys and incidentally during other surveys in 2015.
Cooper's hawk	<i>Accipiter cooperii</i> (nesting)	None/ WL	None	Nests and forages in dense stands of live oak, riparian woodlands, or other woodland habitats often near water	High potential to nest within the Study Area. Suitable habitat is present within the Study Area. Observed during previous surveys.
ferruginous hawk	<i>Buteo regalis</i> (wintering)	BCC/ WL	None	Winters and forages in open, dry country, grasslands, open fields, agriculture	Low potential to occur. Minimal suitable habitat present within the Study Area.
grasshopper sparrow	<i>Ammodramus savannarum</i> (nesting)	None/ SSC	None	Nests and forages in moderately open grassland with tall forbs or scattered shrubs used for perches	Low potential to nest within the Study Area. Minimal suitable habitat present within the Study Area. One recent occurrence within the vicinity of the project site.
great blue heron	<i>Ardea herodias</i> (nesting colony)	None/ None	None	Nests in large trees or snags; forages in wetlands, water bodies, water courses, and opportunistically in uplands, including pasture and croplands	High potential to nest within the Study Area. There is suitable habitat for foraging and nesting. Observed during biological surveys conducted in 2015.
least Bell's vireo	<i>Vireo bellii pusillus</i> (nesting)	FE/ SE	Conditionally Covered	Nests and forages in low, dense riparian thickets along water or along dry parts of intermittent streams; forages in riparian and adjacent shrubland late in nesting season	Moderate potential to occur. Suitable habitat is present within the Study Area. USFWS protocol surveys were conducted in 2015 and this species was not observed. This species has been observed within the Study Area in previous years.
osprey	<i>Pandion haliaetus</i> (nesting)	None/ WL	None	Large waters (lakes, reservoirs, rivers) supporting fish; usually near forest habitats, but widely observed along the coast	Moderate potential to nest within the Study Area. Observed within the Study Area perched on the mudflat in the western part of the Study Area.
red-shouldered hawk	<i>Buteo lineatus</i>	None/ None	Covered	Nests in dense riparian areas, especially with adjacent edges, swamps, marshes, and wet meadows for hunting	Present. Observed during biological surveys conducted in 2015. Suitable habitat is present within the Study Area. Although this species was not observed nesting within the Study Area, this suitable nesting habitat is present on site.
Ridgway's rail	<i>Rallus obsoletus levipes</i>	FE/ SE, FP	None	Coastal wetlands, brackish areas, coastal saline emergent wetlands	Moderate potential to occur. Suitable habitat is present within the Study Area. The species was not detected in the study area in 2015 during formal surveys.
rough-legged hawk	<i>Buteo lagopus</i>	None/ None	Covered	Does not breed in California. Occurs regularly at southern California lakes. Frequents open areas near riparian or other wooded habitats.	Low potential to occur. Minimal suitable habitat is present within the Study Area.

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**Table 3
Special-Status Wildlife Potential to Occur**

Common Name	Scientific Name	Status (Federal / State)	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations	Status on Site or Potential to Occur
southern California rufous-crowned sparrow	<i>Aimophila ruficeps canescens</i>	None/ WL	Covered	Nests and forages open coastal scrub and chaparral with low cover of scattered scrub interspersed with rocky and grassy patches	Moderate potential to occur. Suitable habitat is present and there two recent occurrence within the vicinity of the Study Area.
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i> (nesting)	FE/ SE	Conditionally Covered	Nests in dense riparian habitats along streams, reservoirs, or wetlands; uses variety of riparian and shrubland habitats during migration.	Moderate potential to occur. Suitable habitat is present within the Study Area. USFWS protocol surveys were conducted in 2015 and this species was not observed.
sharp-shinned hawk	<i>Accipiter striatus</i> (nesting)	None/ WL	Covered	Nests in coniferous forests, ponderosa pine, black oak, riparian deciduous, mixed conifer, Jeffrey pine; winters in lowland woodlands and other habitats.	Low potential to nest within the Study Area. Minimal suitable habitat present within the Study Area and there are no recent nesting records in the vicinity.
Swainson's hawk	<i>Buteo swainsoni</i> (nesting)	BCC/ ST	None	Nests in open woodland and savanna, riparian and in isolated large trees; forages in nearby grasslands and agricultural areas such as wheat and alfalfa fields and pasture	Low potential to nest within the Study Area. Minimal suitable habitat present within the Study Area and there are no recent nesting records in the vicinity.
tricolored blackbird	<i>Agelaius tricolor</i> (nesting colony)	BCC/ SE, SSC	None	Nests near fresh water, emergent wetland with cattails or tules, but also in Himalayan blackberry; forages in grasslands, woodland, and agriculture	Not expected to nest within the Study Area, but may forage within the Study Area.
western snowy plover	<i>Charadrius nivosus nivosus</i> (nesting)	FT, BCC/ SSC	None	On coasts nests on sandy marine and estuarine shores; in the interior nests on sandy, barren or sparsely vegetated flats near saline or alkaline lakes, reservoirs, and ponds	Not expected to nest on site. This species nests on coastal beaches and the nearest one is over 6 miles away. However, this species has a high potential to use the Study Area as foraging grounds and was observed in Upper Newport Bay.
western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i> (nesting)	FT, BCC/ SE	None	Nests dense, wide riparian woodlands and forest with well-developed understories	Not expected to occur. No suitable habitat is present in the Study Area.
white-tailed kite	<i>Elanus leucurus</i> (nesting)	None/ FP	None	Nests in woodland, riparian, and individual trees near open lands; forages opportunistically in grassland, meadows, scrubs, agriculture, emergent wetland, savanna, and disturbed lands	High potential to nest within the Study Area. Observed flying over the middle of the Study Area during biological surveys in 2015. Although this species was not observed nesting within the Study Area, suitable nesting habitat is present on site.
yellow-breasted chat	<i>Icteria virens</i> (nesting)	None/ SSC	None	Nests and forages in dense, relatively wide riparian woodlands and thickets of willows, vine tangles and dense brush	High potential to nest within the Study Area. Observed within the Study Area during riparian bird surveys in 2015.
<i>Fish</i>					
Santa Ana sucker	<i>Catostomus santaanae</i>	FT/ SSC	None	Small, shallow, cool, clear streams less than 7 meters in width and a few centimeters to more than a meter in depth; substrates are generally coarse gravel, rubble and boulder	Not expected to occur. The Study Area is outside of the species' known geographic range.
tidewater goby	<i>Eucyclogobius newberryi</i>	FE/ SSC	None	Brackish water habitats along the Calif coast from Agua Hedionda Lagoon, San Diego Co. to the mouth of the Smith River.	Not expected to occur. Minimal suitable habitat present within the Study Area.
<i>Mammals</i>					
American badger	<i>Taxidea taxus</i>	None/ SSC	None	Dry, open, treeless areas; grasslands, coastal scrub, agriculture, pastures, especially with friable soils	Low potential to occur. Minimal suitable open habitat present within the Study Area. No suitable burrows detected during biological surveys conducted in 2015.
big free-tailed bat	<i>Nyctinomops macrotis</i>	None/ SSC	None	Rocky areas; roosts in caves, holes in trees, buildings, and crevices on cliffs and rocky outcrops; forages over water	Low potential to occur. Minimal suitable habitat present within the Study Area.
coyote	<i>Canis latrans</i>	None/ None	Covered	Many areas except very highly urbanized areas	Present. Observed during previous biological survey conducted in 2006 and 2015.
gray fox	<i>Urocyon cinereoargenteus</i>	None/ None	Covered	Shrublands, brushy and open-canopied forests, interspersed with riparian areas. Dens in cavities, in rocky areas, snags, logs, brush, slash piles, old burrows, and under buildings.	Moderate potential to occur. Suitable habitat is present; however, suitable dens were not detected during biological surveys conducted in 2015.
hoary bat	<i>Lasiurus cinereus</i>	None/ None	None	Forest, woodland riparian, and wetland habitats, also juniper scrub, riparian forest, and desert scrub in arid areas; roosts in tree foliage and sometimes cavities, such as woodpecker holes	Not expected to occur. No suitable habitat present.
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>	None/ SSC	None	Desert and montane riparian, desert succulent scrub, desert scrub, and pinyon-juniper woodland; roosts in caves, mines, and buildings	Not expected to occur. No suitable habitat present

**Big Canyon Nature Park
Resource and Recreation Management Plan**

**Table 3
Special-Status Wildlife Potential to Occur**

Common Name	Scientific Name	Status (Federal / State)	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations	Status on Site or Potential to Occur
Pacific pocket mouse	<i>Perognathus longimembris pacificus</i>	FE/ SSC	Conditionally Covered	Fine-grain sandy substrates in open coastal strand, coastal dunes and river alluvium	Low potential to occur. Although suitable soils occur within the project site, the site lacks open areas required by this species.
San Diego desert woodrat	<i>Neotoma lepida intermedia</i>	None/ SSC	Covered	Coastal scrub, desert scrub, chaparral, cacti, rocky areas	High potential to occur. Suitable coastal scrub habitat is present within the Study Area. <i>Neotoma</i> sp. sign detected during biological surveys conducted in 2015.
silver-haired bat	<i>Lasionycteris noctivagans</i>	None/ None	None	Old growth forest, maternity roosts in trees (primarily woodpecker hollows), large diameter snags 50 ft above ground; hibernates in hollow trees, under sloughing bark, in rock crevices, and occasionally in buildings, mines and caves; forages in or near coniferous or mixed deciduous forest, often following stream or river drainages	Not expected to occur. No suitable habitat present
south coast marsh vole	<i>Microtus californicus stephensi</i>	None/ SSC	None	Tidal marshes	Low potential to occur. Limited suitable habitat present within the western portion of the Study Area.
southern California saltmarsh shrew	<i>Sorex ornatus salicornicus</i>	None/ SSC	None	Saltmarsh, salt grass, dense willow, bulrush	Not expected to occur. The site is outside of the species' known geographic range.
western mastiff bat	<i>Eumops perotis californicus</i>	None/ SSC	None	Chaparral, coastal and desert scrub, coniferous and deciduous forest and woodland; roosts in crevices in rocky canyons and cliffs where the canyon or cliff is vertical or nearly vertical, trees and tunnels	Low potential to occur. Suitable habitat for foraging but no suitable roosting habitat.
western yellow bat	<i>Lasiurus xanthinus</i>	None/ SSC	None	Valley foothill riparian, desert riparian, desert wash, and palm oasis habitats; below 2,000 ft; roost in riparian and palms	Not expected to occur. No suitable habitat is present within the Study Area.
Yuma myotis	<i>Myotis yumanensis</i>	None/ None	None	Riparian, arid scrublands and deserts, and forests associated with water (streams, rivers, tinajas); roosts in bridges, buildings, cliff crevices, caves, mines, and trees	Not expected to occur. No suitable roosting habitat present within Study Area.
<i>Invertebrates</i>					
Dorothy's El Segundo Dune weevil	<i>Trigonoscuta dorothea dorothea</i>	None/ None	None	Coastal sand dunes in Los Angeles County.	Not expected to occur. The Study Area is outside of the species' known geographic range and there is no suitable habitat present.
globose dune beetle	<i>Coelus globosus</i>	None/ None	None	Inhabitant of coastal sand dune habitat; erratically distributed from Ten Mile Creek in Mendocino County south to Ensenada, Mexico.	Not expected to occur. No suitable habitat is present within the Study Area. However, occurs in Upper Newport Bay.
mimic tryonia (=California brackishwater snail)	<i>Tryonia imitator</i>	None/ None	None	Inhabits coastal lagoons, estuaries and salt marshes, from Sonoma County south to San Diego County.	Low potential to occur. Minimal suitable habitat within the Study Area.
monarch butterfly	<i>Danaus plexippus</i>	None/ None	None	Wind-protected tree groves with nectar sources and nearby water sources	Not expected to occur. No suitable habitat within the Study Area.
Quino checkerspot	<i>Euphydryas editha quino</i>	FE/ None	Conditionally Covered	Annual forblands, grassland, open coastal scrub and chaparral; often soils with cryptogamic crusts and fine-textured clat; host plants include <i>Plantago erecta</i> (dwarf plantain), <i>Antirrhinum coulterianum</i> (white snapdragon), and <i>Plantago patagonica</i> (woolly plantain) (Silverado Occurrence Complex).	Low potential to occur. Minimal suitable habitat is present within the Study Area. There are no recent occurrences of the species within the vicinity.
Riverside fairy shrimp	<i>Streptocephalus woottoni</i>	FE/ None	Conditionally Covered	Vernal pools, non-vegetated ephemeral pools	Not expected to occur. No suitable habitat is present in the Study Area.
San Diego fairy shrimp	<i>Branchinecta sandiegonensis</i>	FE/ None	Conditionally Covered	Vernal pools, non-vegetated ephemeral pools	Not expected to occur. No suitable habitat is present in the Study Area.
sandy beach tiger beetle	<i>Cicindela hirticollis gravida</i>	None/ None	None	Inhabits areas adjacent to non-brackish water along the coast of California from San Francisco Bay to northern Mexico.	Moderate potential to occur. Some suitable habitat occurs within the Study Area and this species was observed in Upper Newport Bay.

**Big Canyon Nature Park
Resource and Recreation Management Plan**

**Table 3
Special-Status Wildlife Potential to Occur**

Common Name	Scientific Name	Status (Federal / State)	Status (Central-Coastal NCCP/HCP)	Primary Habitat Associations	Status on Site or Potential to Occur
senile tiger beetle	<i>Cicindela senilis frosti</i>	None/None	None	Inhabits marine shoreline, from Central California coast south to salt marshes of San Diego. Also found at Lake Elsinore	Moderate potential to occur. Suitable habitat exists within the Study Area. Observed in Upper Newport Bay.
wandering skipper	<i>Panoquina errans</i>	None/None	None	Salt marsh	Moderate potential to occur. Minimal suitable habitat is present within the Study Area but the species does occur in Upper Newport Bay. There are recent occurrences within the vicinity of the Study Area.
western beach tiger beetle	<i>Cicindela latesignata latesignata</i>	None/None	None	Mudflats and beaches in coastal Southern California.	Moderate potential to occur. Suitable habitat is present within the Study Area.
western tidal-flat tiger beetle	<i>Cicindela gabbii</i>	None/None	None	Inhabits estuaries and mudflats along the coast of Southern California.	High potential to occur. Suitable habitat exists within the Study Area and the species is found in Upper Newport Bay.

Federal Designations

BCC: Fish and Wildlife Service: Birds of Conservation Concern
 FE: Federally listed as endangered
 FSC: Federal Species of Concern
 FT: Federally listed as threatened
 USBC: United States Bird Conservation Watch List

State Designations

CSC: California Special Concern Species
 SSC: California Species of Special Concern
 SE: State-listed as endangered

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Big Canyon Nature Park Resource and Recreation Management Plan

2.3.4 Wildlife Corridors

Wildlife corridors are areas of habitat that connect wildlife populations separated by human development. Corridors provide important linkages for wildlife attempting to move from one habitat patch to another, and as such are particularly high-value (given their often small size) in heavily fragmented landscapes. Wildlife corridors can be continuous or semi-continuous habitat. For instance, bridges, culverts, road underpasses, and landscaped green belts can all serve as corridors for wildlife (Penrod et al. 2001). What constitutes a functional corridor will depend largely on the species in question, their body size, and their mode of movement. Upper Newport Bay is an important stopover for migrating waterfowl and shorebirds on the Pacific Flyway. While Upper Newport Bay is connected to the main body of the Coastal Reserve by a number of narrow corridors, the BCNP is not currently recognized by the South Coast Missing Linkages Project as a functional corridor to adjacent lands (Penrod et al. 2001). Riparian areas are known to provide wildlife connectivity between patches of fragmented habitat and are considered high value wildlife habitat for many amphibian and bird species. Although riparian habitat occurs along Big Canyon Creek, the riparian habitat on site connects with developed areas to the northeast and do not provide high potential for additional wildlife movement in the vicinity. Though the BCNP may be utilized by wildlife in the area and may provide linkage to lower quality habitats (i.e., golf courses and parks) along Big Canyon Creek east of the BCNP, the BCNP is more likely to provide live in habitat for a variety of species, and less likely to provide movement potential based on its size and habitats adjoining the area. Movement to the east may in fact cause a habitat sink to exist, resulting in an ecological trap for species crossing over to the golf course side.

Key species used to identify land-based wildlife linkages and corridors in Southern California include mountain lion (*Felis concolor*), black bear (*Ursus americanus*), coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), and mule deer (*Odocoileus hemionus*). For the purposes of this discussion, all but the black bear could be discussed, though mountain lion and gray fox have not been reported within the BCNP for many decades. Key bird species known to occur within and immediately adjacent to the BCNP include least Bell's vireo (*Vireo bellii pusillus*), coastal California gnatcatcher (*Polioptila californica californica*), Belding's savannah sparrow (*Passerculus sandwichensis*), yellow-breasted chat (*Icteria virens*), least tern (*Sterna antillarum browni*), snowy plover (*Charadrius nivosus nivosus*), American peregrine falcon (*Falco peregrinus anatum*), and other resident and migratory birds. Special-status amphibian or reptile species known to occur within the BCNP include the coast range newt (*Taricha torosa*), western pond turtle (*Actinemys marmorata*), coast horned lizard (*Phrynosoma blainvillii*), and silvery legless lizard (*Anniella pulchra pulchra*). The western pond turtle was common in the BCNP twenty years ago; however, due to increasing pond temperature and urbanization in the surrounding areas, recent sightings are rare.

Big Canyon Nature Park Resource and Recreation Management Plan

2.4 Cultural Resources

The City contains a rich and diverse historic past. According to the Natural Resources Element within the City of Newport Beach General Plan (City of Newport Beach 2006), fossils in the central Santa Ana Mountains represent the oldest formations in Orange County at 145 to 175 million years old. Changes in geological land formations over time have resulted in a mix of aquatic and terrestrial fossils underlying the City. The Miocene-age rock units (26 million years ago [mya] to 7 mya), particularly in the Newport Coast area, are considered to be of high-order paleontological significance (6 to 9 on a scale of 1 to 10).

Other deposits found in the Newport Beach area include a variety of marine mammals, sea birds, mollusks, and a variety of vertebrate animals typically associated with the Ice Age (2.5 mya to 15,000 years ago). Local paleontological sites, particularly near the Castaways, have yielded fossils of Ice Age horses, elephants, bison, antelopes, and dire wolves. Also, a number of localities in the portions of the Vaqueros formation that underlie the Newport Coast area have yielded a variety of invertebrate and vertebrate fossils, and are also considered to be of high-order paleontological significance. Other areas with significant fossils and known paleontological deposits include the Banning Ranch area, which contains at least fourteen documented sites of high significance, and Fossil Canyon, in the North Bluffs area, which is considered a unique paleontological locality.

Newport Beach also contains many significant archaeological sites. The Upper Newport Bay area has yielded some evidence for the earliest human occupation of Orange County and date to about 9,500 years before present. Over fifty sites have been documented in the Newport Beach area, including the Newport Coast area and Banning Ranch, many yielding substantial information regarding the prehistory of the City and County, and have included human burials. At least two and possibly three distinct cultural groups inhabited the area, including the Tongva and Acjachemem tribes, although the boundaries of their tribal territories are unclear.

2.5 Issues, Threats, and Potential Impacts

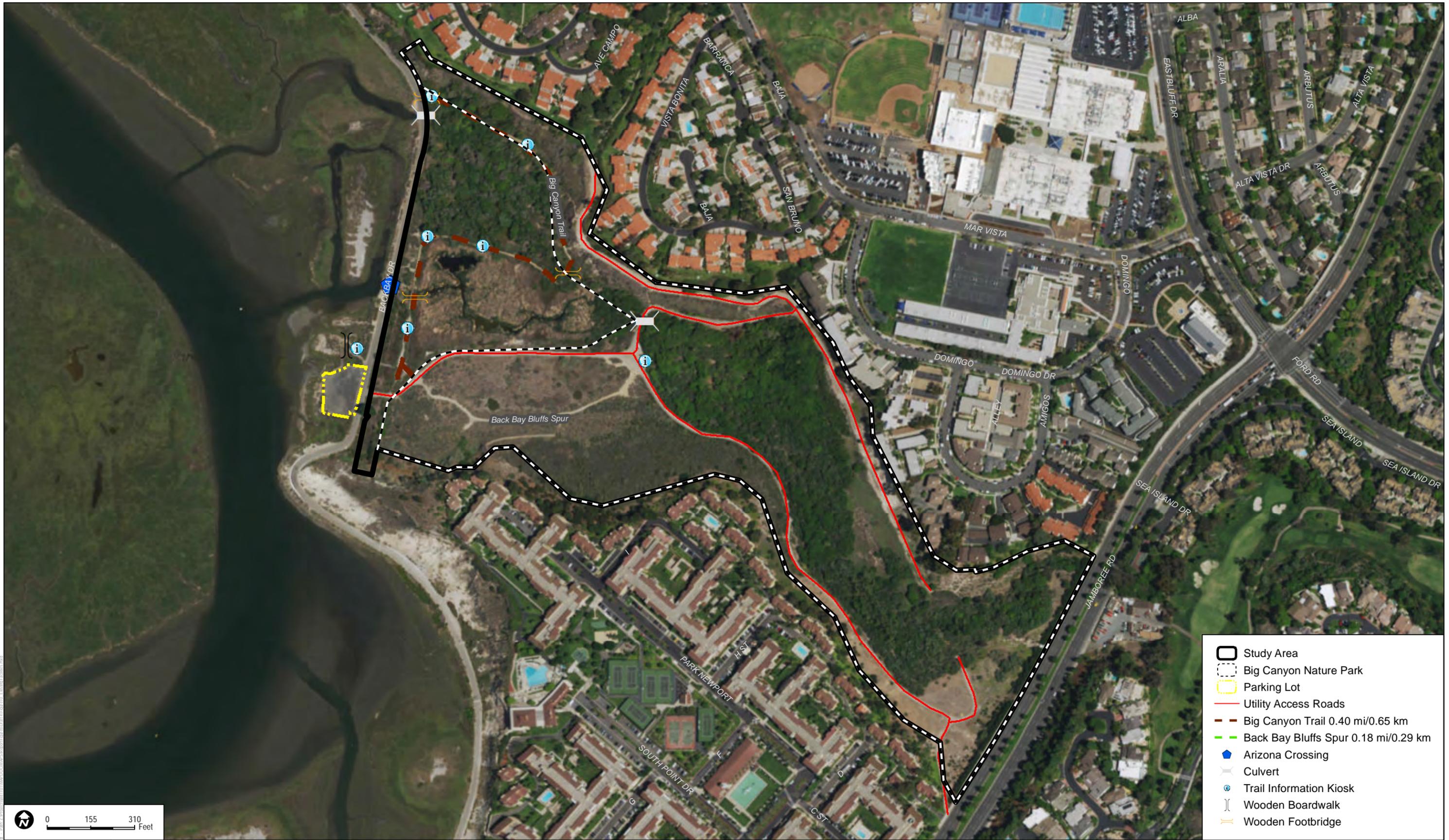
2.5.1 Public Use

The BCNP is an integral part of the Upper Newport Bay Ecological Preserve (County designation) and provides unique opportunities for the public to learn about biodiversity and environmental protection in the area. The area is frequently used by local communities for passive recreation and by the Orange County Department of Education for outdoor education. Consequently, ongoing repairs to existing infrastructure and replacement/enhancement of trails and interpretative facilities have been required to address illegal and damaging activities (i.e., trampling of vegetation and soil erosion) occurring within the BCNP.

Big Canyon Nature Park Resource and Recreation Management Plan

Information kiosks and interpretative signage intended to educate the public about biological resources and water quality issues have been located in the western portion the BCNP, primarily on state-owned land managed by the California Department of Fish and Wildlife (CDFW) (Figure 10). The BCNP also has a historic network of graded pedestrian trails, both single-track trails and utility access roads that provide public access throughout the BCNP. Recent improvements to the existing trail system include improvements to the utility access road and interpretive facilities along the trail network. Additionally, signage has been installed in trail-side restoration areas to discourage unauthorized access into sensitive restoration areas. These improvements to the network of established trails, along with the placement of clear signage to avoid protected areas, minimizes disruption to habitat and wildlife activity in the BCNP, and discourages illegal and/or damaging activities such as the trampling of vegetation and soil compaction. Although new unauthorized trails, trampling of vegetation, and harassment and collection of native species may occur within the BCNP these impacts are likely to be reduced with the recent improvements discussed above.

Back Bay Drive is located outside the western boundary of the BCNP and provides access to the BCNP, as well as a throughway along the edge of Upper Newport Bay Ecological Preserve. Back Bay Drive is a single one-way (northward) paved lane, which provides a dedicated southbound bike lane, a shared northbound vehicle/bike lane, and a pedestrian walkway on the bayside. It is heavily utilized by the public especially during weekends. A paved parking lot and set of interpretative displays owned and managed by the state (CDFW) is located outside the southwestern portion of the BCNP, west of Back Bay Drive (Figure 10).



- Study Area
- Big Canyon Nature Park
- Parking Lot
- Utility Access Roads
- Big Canyon Trail 0.40 mi/0.65 km
- Back Bay Bluffs Spur 0.18 mi/0.29 km
- Arizona Crossing
- Culvert
- Trail Information Kiosk
- Wooden Boardwalk
- Wooden Footbridge

0 155 310 Feet

SOURCE: Google Imagery, 2015; CNDDDB, 05/05/2015; County of Orange, 2014.

DUDEK

Big Canyon - Resource & Recreation Management Plan

FIGURE 10
Existing Facilities Map

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Big Canyon Nature Park Resource and Recreation Management Plan

2.5.2 Urban Edge Effect

Big Canyon Nature Park is bounded to the north and south by single- and multi-family residential development and to the west by roads and other City infrastructure. This large amount of urban edge (relative to the size of the Park) leaves native habitats and wildlife in Big Canyon susceptible to what is termed “edge effects”. Edge effects refer to a variety of potentially negative effects to wildlife caused by being geographically close to or cut off by an urban landscape. Example edge effects include increased light and noise pollution, greater exposure to pesticides and pollutants, and increased threats from trash, invasive species, pets and feral animals, unauthorized public access, wildfire (accidental and intentional), species collection, and habitat degradation. Urban edges also pose challenges to natural wildlife movement and leave wildlife vulnerable to genetic bottlenecks that undermine their long-term survival in a habitat patch.

2.5.3 Habitat Fragmentation

The NCCP recognizes two main effects of habitat fragmentation on ecosystem functions. First, fragmentation often reduces the total area of habitat which may affect population sizes and extinction rates. Second, fragmentation reduces connectivity and movement among populations, and therefore affects natural processes like pollination, dispersal, immigration and emigration.

The BCNP is adjacent to development to the north, east, and south; thus, provides lower suitability for wildlife corridors and linkages. Although the BCNP is not a designated habitat linkage within the Coastal NCCP Reserve, the BCNP is designated non-Reserve open space land and connects with Upper Newport Bay, which is a designated habitat linkage within the Coastal NCCP Reserve. Additionally, the BCNP is comprised of riparian and upland communities suitable to support (at least in part) a number of smaller to moderately sized wildlife species such as bobcat, gray fox, coyote, raccoon (*Procyon lotor*), long-tailed weasel (*Mustela frenata*), as well as various reptiles, amphibians, and riparian and upland bird species. Although the BCNP is unlikely to provide a wildlife corridor or linkage for larger wildlife species (i.e., mountain lions and mule deer), it does provide live-in habitat. A modest connection to a golf course occurs via a concrete culvert underneath Jamboree Road, at the eastern boundary of the BCNP. This RRMP provides recommended management practices to minimize the impact of habitat fragmentation on the movement and dispersal of species, including habitat restoration and the control of edge effects.

Big Canyon Nature Park

Resource and Recreation Management Plan

2.5.4 Invasive Species

Invasive species are species not native (or exotic) to a particular area and that once established, tend to substantially alter the environment for native plants and animals. The following section describes the current extent of invasive species in Big Canyon.

Plants

Invasive plant species degrade native vegetation communities and reduce biodiversity by outcompeting native plants for space and resources. Invasive plant species in BCNP that occur along recreational trail, fuel modification zones, and along park boundaries have the potential to invade and thus degrade existing native vegetation.

Invasive species in Big Canyon were evaluated in 2003 as part of the Big Canyon Creek Historic Tidal Wetlands Conceptual Restoration Plan (CCI 2004). Subsequent surveys in 2007 also documented the extent of exotic plant invasions (WRC 2007). Additional invasive plant mapping efforts were conducted within the BCNP by Dudek on April 20, 2015 and July 17, 2015. Dudek conducted a physical inventory of exotic tree species that included collection of the following information: species identification, trunk diameter, and height. Data collection was conducted using handheld Global Positioning System (GPS) equipment and results were uploaded and exported into GIS. Figure 11 illustrates the distribution of invasive plant species within the BCNP.

Invasive plants of primary concern include black mustard (*Brassica nigra*), ngaio tree or lollipop tree (*Myoporum laetum*), fennel (*Foeniculum vulgare*), black mustard, pampas grass (*Cortaderia selloana*), Brazilian peppertree, Peruvian peppertree, sweet fennel (*Foeniculum vulgare*), and Volutaria knapweed (*Volutaria tubuliflora*).

Black mustard. Black mustard dominates the ruderal areas of BCNP and is occasionally found invading annual grasslands and California buckwheat scrub primarily located along the southern and eastern portions of BCNP.

Brazilian and Peruvian peppertree. Brazilian and Peruvian peppertree are dominant in patches within the central and eastern portion of the BCNP. Peppertree is intermixed with disturbed arroyo willow riparian forest associated with Big Canyon Creek.

Ngaio tree. The largest area of *Myoporum* is found within the coastal sage California buckwheat scrub. Moderate densities of *Myoporum* are found within the central portion of BCNP.

Big Canyon Nature Park Resource and Recreation Management Plan

Pampas grass and sweet fennel. These species occur in scattered grassland and riparian vegetation communities throughout the Study Area.

Volutaria knapweed. A small population of *Volutaria* knapweed (likely *Volutaria tubuliflora*) was discovered in Big Canyon in the spring of 2015. This is only the second known occurrence of the species in the continental United States; *Volutaria* was first discovered near Borrego Springs in 2010 where it has spread quickly. It's taxonomy and origins are still unclear and are undergoing research. The plant's ability to mature rapidly and colonize coastal and desert habitats alike suggests the species could be highly invasive locally. Approximately 3,500 plants were found and hand-weeded in 2015, mostly concentrated in a single stand. Removal efforts were led by the Irvine Ranch Conservancy and carried out largely by IRC and NBC volunteers. The species should be a target of future monitoring and removal efforts.

Other secondary exotics resulting from disturbances listed above within BCNP include Italian thistle (*Carduus pycnocephalus*), Mexican fan palm (*Washingtonia robusta*), annual yellow sweetclover (*Melilotus indicus*), blessed milkthistle (*Silybum marianum*), summer mustard (*Hirschfeldia incana*), Uruguayan pampas grass (*Cortaderia selloana*), sea fig (*Carpobrotus chilensis*), common iceplant (*Mesembryanthemum crystallinum*), cultivated radish (*Raphanus sativus*), castor bean (*Ricinus communis*), tree tobacco (*Nicotiana glauca*), and salt cedar.

Wildlife

Surveys for aquatic invasive species were conducted within the BCNP by Dudek on April 29, 2015 and June 26, 2015. Dudek conducted two trapping events for aquatic species using three wire minnow traps baited with mackerel. Traps were set within the upper reach (a couple hundred feet downstream of the Jamboree culvert), middle reach, and lower reach (near maintenance road crossing of Big Canyon Creek) in the afternoon/dusk and checked early the following morning.

Primary invasive wildlife species detected within BCNP include African clawed frog (*Xenopus laevis*) and red swamp crayfish (*Procambarus clarkii*). Figure 11 illustrates the distribution of invasive wildlife species within the Study Area.

Big Canyon Nature Park
 Study Area

Tree Species

- Arizona ash
- Brazilian pepper tree
- Canary Island date palm
- Eucalyptus sp.
- Common fig
- Goldenrain tree
- Mexican fan palm

Invasive Species Traps

- ▲ Invasive Species Trap 1
- ▲ Invasive Species Trap 2
- ▲ Invasive Species Trap 3

Invasive Wildlife

- ◆ American Bullfrog

Vegetation Communities

- ALHE, Alkali Heath Marsh Alliance
- BBCS, California Brittle Bush-California Sagebrush Association
- BBS, California Brittle bush Alliance
- CBCS, Coyote Brush-California Sagebrush Association
- CBM, California Bulrush Marsh Alliance
- CCM, California Cordgrass Marsh Alliance
- DIST, Disturbed or Barren Mapping Unit
- FOSA, Fourwing Saltbush Alliance
- FWM, Cattail Marshes Alliance
- INMU, Intertidal Mudflat Mapping Unit
- LBS, Lemonade Berry Alliance
- NNG, Upland Mustards Semi-natural Stands
- ORN, Ornamental Landscaping Mapping Unit
- OTDE, Other Developed Areas Mapping Unit
- OW, Open Water Mapping Unit
- PIWE, Pickleweed Mats Alliance
- PTMG, Pepper Tree or Myoporum Groves Semi-natural Stands
- QUBR, Quailbush Alliance
- SAPA, Salt Panne Mapping Unit
- SBS, California Sagebrush Alliance
- SGMJ, Salt Grass-Marsh Jaumea Association
- TRANS, Transportation Mapping Unit
- URBAN, Urban and Commercial Mapping Unit
- dAWRF, Arroyo Willow Disturbed Mapping Unit
- dBBS, California Brittle Bush Disturbed Mapping Unit
- dFOSA, Fourwing Saltbush Disturbed Mapping Unit
- dSBFS, California Sagebrush-Fourwing Saltbush Disturbed Mapping Unit
- dSBS, California Sagebrush Disturbed Mapping Unit



SOURCE: Google Imagery, 2015.



FIGURE 11
Invasive Species Map

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Big Canyon Nature Park Resource and Recreation Management Plan

African Clawed Frog. This species was trapped in the upper and middle reaches of the BCNP, but assumed to occur throughout Big Canyon Creek.

Red Swamp Crayfish. These species was trapped in the upper and middle reaches of the BCNP, but assumed to occur throughout Big Canyon Creek.

2.5.5 Water Quality and Beneficial Uses

Water quality in Big Canyon has been negatively impacted by several factors including urban development, establishment of invasive plant species, the loss of native wetland and riparian habitats, and excessive irrigation runoff from upstream developments. Surface waters from Big Canyon have been found to contain fertilizers, pesticides, and other pollutants that enter Upper Newport Bay (CCI 2004).

On-going monitoring in Big Canyon Creek since 2007 has found elevated concentrations of selenium. The selenium is a naturally occurring element found in the Monterey formation that underlies much of Big Canyon (Reeder 2011). Selenium is needed for normal metabolic function in humans and other animals in low concentrations. While the selenium concentrations found in Big Canyon Creek are not at levels to cause reproductive failure and/or embryonic deformity, the concentration are above the California Toxic Rule standard.

The Water Quality Control Plan for the Santa Ana Region (8) (“Basin Plan”) (RWQCB 2008) was reviewed to determine the beneficial uses for the Big Canyon Creek’s surface water resources. Big Canyon Creek is not identified within the Basin Plan as a significant surface stream. However, it is expected that several of the beneficial uses identified for Upper Newport Bay would appropriately apply to Big Canyon including:

- **BIOL** (Preservation of Biological Habitats of Special Significance) waters support designated areas or habitats, including, but not limited to, established refuges, parks, sanctuaries, ecological reserves or preserves, and ASBSs, where the preservation and enhancement of natural resources require special protection.
- **RARE** (Rare, Threatened, or Endangered Species) waters support habitats necessary for the survival and successful maintenance of plant or animal species designated under state or federal law as rare, threatened, or endangered.
- **REC-2** (Non-contact Water Recreation) waters are used for recreational activities involving proximity to water but not normally involving body contact with water where ingestion of water would be reasonably possible. These uses may include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and

Big Canyon Nature Park Resource and Recreation Management Plan

marine life study, hunting, sightseeing, and aesthetic enjoyment in conjunction with the above activities.

- **WILD** (Wildlife Habitat) waters support wildlife habitats that may include, but are not limited to, the preservation and enhancement of vegetation and prey species used by waterfowl and other wildlife.

This RRMP provides recommended management practices to minimize the impact of water quality within BCNP.

2.5.6 Existing Fuels and Fire Hazards

Another threat to the natural and recreational resources in Big Canyon is wildfire. A number of factors influence the threat of fire and the ability of firefighters to fight wildfires including the type of vegetative cover, topography, regional climate, local weather conditions, and level of human access. As noted in Section 2.2.3 (Climate), the regional climate is characterized by warm, dry summers and relatively cool, wetter winters. Prevailing winds are onshore, although dry offshore Santa Ana winds in the fall can gust to 50 miles per hour or higher inland from the Study Area. Given the Study Area's proximity to the Pacific Ocean, fuel moistures in typical weather patterns are higher than in more inland areas, with the potential for rapid drying during Santa Ana events. Low fuel moistures can contribute to increased fire hazard in the Study Area if ignitions are realized.

The density and structure of vegetation as well as species composition also affect fire behavior and the likelihood of ignition. Some plant communities and their associated plant species have increased flammability based on plant physiology (resin content), biological function (flowering, retention of dead plant material), physical structure (leaf size, branching patterns), and overall fuel loading. For example, fire burning in grasslands may exhibit shorter flame lengths than those burning in sage scrub types; however, fire in grasslands often spreads more rapidly than fire in other vegetation types. Wildfire disturbances can also have dramatic impacts on soil stability, individual plants, and plant composition, including exotic species invasion. Heat shock, accumulation of post-fire charred wood, and change in photoperiods due to the removal of shrub canopies may all stimulate seed germination. The post-fire response for most species is vegetative reproduction and stimulation of flowering and fruiting. The combustion of aboveground biomass alters seedbeds and temporarily eliminates competition for moisture, nutrients, heat, and light. Species that can rapidly take advantage of the available resources often flourish.

Another critical factor to consider is the response of entire vegetation communities to fire frequency. While many native plant species, particularly members of coastal sage scrub, have

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adapted to fire (e.g. fire and/or smoke is required for healthy seed germination in some species), too frequent fire can result in conversion of scrublands and forests to annual grasslands. With the lack of natural fire disturbance or manual fuel reduction efforts, it is assumed that biomass and associated fuel loading will increase over time in Big Canyon. Currently, fuel reduction efforts occur on an annual basis within the hazard reduction zones (HRZs) of Big Canyon. The HRZs occur along the perimeter of the park where there is adjacent residential development and span a width of 100 feet, measured outward from the edge of structures. A portion of the HRZs extend onto the City-owned portion of Big Canyon (Figure 6).

The density and stature of vegetation in Big Canyon varies by location ranges from relatively bare, flat areas supporting annual grassland to steep shrub covered slopes, to moderately dense riparian forests, to dense stands of invasive pepper trees. The vegetated slopes along the edges of BCNP have the potential to ignite and spread fire to the interior of the park where native riparian and invasive trees (i.e. high fuel loads) exist and could carry a fire to residential structures. This threat is especially acute during offshore, Santa Ana conditions (although fire risk is also present during onshore wind patterns), when embers from the burning of large trees could be carried long distances.

While wildfire is a potential threat to adjacent structures, neighboring urban development also presents the greatest fire threat to the natural environments in Big Canyon. The most likely ignition sources include adjacent residential developments, vehicles on Jamboree Road and Back Bay Drive, and trail users in BCNP.

Fire history data can provide an understanding of fire frequency, fire type, vulnerability, and potential ignition sources. According to a review of available historical fire perimeter data (FRAP 2015), there have been no recorded fires in BCNP in the period between 1910 and 2013. The closest large fire burned approximately 3.5 miles southeast of BCNP in Buck Gully (1993 Laguna Fire). While the available fire perimeter data record captures fire information only for fires of a certain minimum size, local fire department information can augment this data gap. Based on information from the Nbfd, BCNP has not been subject to smaller fires, nor has it served as a notable source of ignitions to date. A small fire was reported on May 19th, 2015 that burned approximately 800 square feet of coastal sage scrub and iceplant vegetation along the north bluff of BCNP (IRC, pers. com). It appeared that the fire started from a large, invasive Mexican fan palm. It then spread to the north by wind across a utility road and to the adjacent hillside. It is notable that the fire occurred during a Santa Ana wind event and a Red-Flag Warning had been issued for Orange County that day by the National Weather Service.

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2.5.7 Erosion

Steep slopes, particularly areas without vegetation, are susceptible to soil erosion. Erosion occurs when soil particles are displaced and transported by wind or water as a result of weather or runoff. The BCNP topography is characterized by a relatively narrow floodplain zone bordering Big Canyon Creek on either side, with moderately steep slopes to the north and south. The bluffs along the northern and southern portion of the BCNP exhibit steeper slopes, exceeding 50%, while the remaining slopes within the BCNP are relatively flat average between 5% and 10%. Although the floodplain moderately slopes from east (upstream) to west (downstream) to eventually flow into Upper Newport Bay, slope aspect varies significantly along the northern and southern bluffs directly affecting vegetation composition and local drainage patterns. Many steep slopes are also covered by non-native iceplant that are shallowly rooted and have heavy above-ground tissues. These traits make iceplant a poor cover type for steep slopes, leaving them vulnerable to future soil erosion.

Unauthorized trails located along the northern and southern bluffs of the canyon have led to significant habitat disturbance, soil compaction, and erosion. These unauthorized trails tend to serve as short-cuts that connect users to the larger authorized trails system. In BCNP, unauthorized trails tend to occur on steeply sloping terrain where the risk of erosion is high. Consequently, sections of these trails show considerable incising and/or have eroded to bedrock.

Potential impacts resulting from current and future erosion in Big Canyon include:

- Increased sedimentation within Big Canyon Creek and its tributaries
- Degradation of surface water quality (i.e., increased turbidity)
- Reduction in soil productivity and water-holding capacity
- Alteration of natural drainage patterns
- Increased periodicity, volume, and velocity of stormwater runoff
- Loss of ecosystem value as a result of habitat type conversion
- Degradation of public resources resulting in hazardous conditions for hikers, bikers, and equestrian users
- Reduction in scenic value as a result of increased barren areas.

2.5.8 Vector Control

The Orange County Vector Control District (OCVCD) is a special district originally formed in 1947 and dedicated to protecting public health by controlling rats, flies, mosquitoes, red

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imported fire ants and other disease vectors and pests. The OCVCD has conducted mosquito management throughout Orange County, including the Newport Bay Ecological Reserve for decades. Ponded areas within Big Canyon's freshwater marsh just east of Back Bay Drive have become a chronic breeding area for mosquitoes. This area of Big Canyon is owned by the State of California and managed by CDFW, who has worked with OCVCD to manage the aquatic environment for mosquitoes. OCVCD has used ultra-low volume fogging treatments to suppress the adult Tule mosquito (*Culex erythrothorax*) population. Chemicals used during fogging treatments include synthetic versions of plant-derived insecticides containing pyrethroid compounds such as AquaANVIL(TM). These products are registered with the EPA and applied according to label directions by OCVCD's trained, certified technicians. These measures are considered necessary in order to protect members of the public who live and recreate in the area, as well as the local wildlife. More recently, OCVCD has had significant success in controlling mosquito breeding by altering water levels in the ponded area with a large siphon. However, the bulrush mats have become so thick and dense that this method has become less effective.

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3 PUBLIC ACCESS AND RECREATION MANAGEMENT

3.1 City of Newport Beach Management Goals

A variety of diverse, valuable and sensitive biological resources occur within the City of Newport Beach. The City has a long established history of sustainable development through the efficient use and conservation of its natural resources. Newport Beach has had a Recreation and Open Space Element as part of its General Plan since 1973. This element was amended most recently in 1998.

The City of Newport Beach owns several undeveloped areas designated as ESAs by the Local Coastal Plan that support natural habitats and biological resources. There are 28 identified ESAs within the City including one in Big Canyon. Other resources include the City's undeveloped canyons, hillsides, and coastal bluffs located primarily in the Newport Coast area. Many of these resources are not preserved as parks or dedicated open spaces; however, local, state, and federal regulations protect many of the sensitive biological resources they may contain from development or degradation.

The City's General Plan includes broad goals that encompass preservation of the land and recreational amenities for its residents:

Goal NR 16, Protection and management of Upper Newport Bay commensurate with the standards applicable to our nation's most valuable natural resources.

Policy NR 16.2, Big Canyon Creek Restoration Project – Coordinate the Big Canyon Creek Restoration Project so that its outcomes are consistent with goals for Upper Newport Bay established by Orange County and the Department of Fish and Game. (Imp 14.3, 14.7)

Policy NR 16.5, Public Uses within Upper Newport Bay Ecological Reserve – Maintain public use of the Upper Newport Bay Ecological Reserve to the extent such use is consistent with the preservation of sensitive resources. (Imp 2.1, 23.1)

The City has historically been sensitive to the need to protect and provide access to these scenic resources and has developed a system of public parks, piers, trails, and viewing areas.

3.2 Adaptive Management

Adaptive management is a cornerstone for natural resource management within the Central-Coastal Subregion NCCP/HCP. The NCCP defines adaptive management as “a flexible, iterative

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approach to long-term management of biotic and abiotic resources that is directed over time by the results of ongoing monitoring activities and other information.” This conservation approach was adopted by the CDFW in 1993 and is incorporated into the Section 4(d) Special Rule (Special Rule) for management of the coastal California gnatcatcher. Adaptive management and several related conservation guidelines were deemed necessary to maintain the net long-term habitat value of the Reserve System. The following guidelines contribute to the maintenance of the Reserve and are discussed in Section 5.2 within the Central-Coastal Subregion NCCP/HCP. These guidelines include:

- Monitoring and associated adaptive management of the biological resources located within the Reserve System;
- 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, and construction of additional western spadefoot toad breeding sites;
- Management carried out by means of short-term and long-term fire management programs within the Reserve System;
- Management of public access and recreational uses within the Reserve System;
- Management designed to minimize the impacts of ongoing operations/maintenance of uses within the Reserve System that existed prior to approval of the NCCP-HCP;
- Assurance that permitted infrastructure uses proceed in the manner provided for in the Central-Coastal Subregion NCCP/HCP in order to minimize impacts of new uses to be allowed within the Reserve System;
- Interim management of privately-owned lands for the above adaptive management elements purposes prior to transfer of legal title to permanent public or nonprofit ownership within the Reserve System;
- Restoration and enhancement measures through: (a) acquisition of existing CSS habitat or (b) 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.”

The overall purpose is to help maintain and, where feasible, enhance the long-term net habitat value within a sub-region. The broad overall goals as defined within the Principles of Reserve Design Species Conservation and Adaptive Management (1997) for land management are as follows:

- Ensure the persistence of a native-dominated vegetation mosaic in the planning area

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- Restore or enhance the quality of degraded vegetation communities and other habitat-types consistent with overall conservation goals for species and natural communities
- Maintain and restore biotic and abiotic natural processes, at all identified scales, for the planning area.

This RRMP will employ the same adaptive management approach and follow the same guideline for management of natural and recreational resources.

3.3 Existing Recreation Facilities

Existing facilities such as trails and roads, trailheads, and visitor resources (e.g. story telling areas and interpretive elements) provide the public with recreational and educational outlets. The following sections describes the existing facilities within the BCNP.

3.3.1 Access Roads and Sewer Lines

Most of the authorized access in Big Canyon occurs along 1.2 miles of gravel, maintenance roads (Figure 10). These gravel roads were built in the 1980's to provide access to sewer lines that were installed within the canyon. These roads are wide (from 10 to 20 feet in width) to permit access by large maintenance and emergency vehicles (e.g. dump trucks). One sewer line/maintenance road follows the northern bluff while a second road occurs within the canyon bottom and parallels the southern boundary from the paved parking lot to the southeast corner where it merges with the other sewer line. A paved, concrete Arizona crossing bridges the northern and southern maintenance roads (Figure 10). One additional sections of sewer line/roads, which merges with the southern sewer line, enters the canyon from Jamboree Road in the southeast corner of the Study Area.

These gravel access roads connect to both Back Bay Drive and to Jamboree Road. An asphalt paved parking lot on land owned by the state of California is located at the mouth of Big Canyon on the western side of Back Bay Drive outside the footprint of BCNP.

3.3.2 Trails and Trailheads

In addition to wide, gravel maintenance roads, the western portion of Big Canyon can be explored by use of a 0.4 mile single-track trail (Figure 10). The trail is accessed from Back Bay Drive in the northwest corner of Big Canyon and from the southern maintenance road close to the intersection of Back Bay Drive and the lower (or southern) gravel road. This trail is located almost entirely on state-owned land and meanders through disturbed arroyo willow riparian

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forest and freshwater marsh parallel to Back Bay Drive. This nature trail includes bridges and boardwalks over water courses and wetland areas.

The state-owned asphalt parking lot at the mouth of Big Canyon serves as the main meeting place and starting point for use of all public trails in Big Canyon. The condition of the single-track trail has deteriorated since it was first created in the 1980's. The bridges and boardwalks adjacent to Back Bay Drive are deteriorated and flood-damaged and no longer provide the Americans with Disabilities Act (ADA) access to the area for which they were designed. Unauthorized trails have been created on the northern bluffs by local residents taking shortcuts into the canyon. While the gravel access roads are maintained, they are not well suited for recreational uses approved in Big Canyon. The gravel is generally loose and its size is large, making it a poor surface for hiking, jogging, or biking. These roads produce dust during windy days and when driven on by vehicles.

3.3.3 Visitor Resources

Trails in Big Canyon Nature Park are open daily from dawn to dusk for self-guided hiking and biking only, and during scheduled docent-led programs. Information on guided recreational, stewardship and trail work programs, as well as volunteer opportunities, can be found at LetsGoOutside.org. Programs are free, but pre-registration is required. Dogs are permitted in Big Canyon, however, to protect sensitive habitats and wildlife, and in accordance with City Ordinance 7.04.020, dogs must be leashed in public and must remain on trails. Dogs are predators and the behavior of wildlife such as bobcats and birds can be disrupted by the presence of dogs.

Big Canyon is one of the primary access points for visitors to Upper Newport Bay and is frequently visited by the public and school groups for recreation, wildlife observation, and hands-on educational activities. Newport Bay Naturalists and Friends currently sponsors a wide range of programs and activities around upper Newport Bay, including some in Big Canyon for all ages and interests. These free programs are offered in partnership with the NBC, Newport Unified School District, other local school districts, local Scout troops, CDFW, the County of Orange, and the City. The shallow waters of Upper Newport Bay limit recreational boating to small craft such as kayaks. There is no official access to waters of the bay at the mouth of Big Canyon.

Hikers, joggers, and bicyclists tend to concentrate their activities along Back Bay Drive. The lack of an identifiable trailhead to Big Canyon from the CDFW parking lot and the presence of a closed and locked access gate does not provide an inviting entrance. It appears that many visitors using this parking lot never explore the interior of the canyon.

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The existing parking lot at BCNP can accommodate 35 cars and two buses. Currently there is no charge for parking, but CDFW may begin charging a parking fee at some point in the future. There are no bicycle racks provided. On a seasonal basis, the Inside the Outdoors education program installs two portable restrooms at the edge of the parking lot. The restrooms are routinely locked, which has frustrated visitors expecting regular access to bathroom facilities.

A wood timber kiosk is located adjacent to the parking lot on state-owned property. The trails leading to the kiosk have been damaged by flooding and are not clearly marked. Sun-faded displays on the kiosk include interpretive information related to the ecology of the Bay and its relationship to the Pacific Coast Flyway. A brochure rack includes activity information from California State Parks and the City of Newport Beach. IRC installed two additional wood-framed kiosks in 2014, one in the center of the park and the other at the entrance off of Jamboree Road. Both kiosks showcase a trail map and park rules.

3.4 Proposed Recreation Facilities

This plan recommends a number of proposed enhancements to facilities in BCNP, including enhanced trails and trailheads, improved facilities for public gathering, and the installation of more interpretative features. The intent of the proposed facilities would be to enhance public use and educational opportunities and to provide coordinated trail access and interpretive signage. Given the condition and characteristics of BCNP, an interpretive program focused on improving ecosystem function in the canyon would be appropriate and may include interpretive features focused on the canyon's natural habitats and processes and the active management efforts identified to improve ecosystem function (e.g., habitat restoration, fuel and invasive species management, engineering and installation of water quality structures). The proposed facilities are described in greater detail below and depicted in Figure 12.

3.4.1 Trails and Trailheads

This plan proposes increasing the functionality of and connectivity among existing authorized access trails. In the absence of certain authorized connections, the public has created a series of unauthorized trails and shortcuts. Unfortunately, these unauthorized trails degrade habitat, are often unsafe for use, and require excessive management. As an alternative, this plan encourages the creation of a limited number of safer, more attractive, and sustainable trail connections for public use. These new or improved trail connections (TCs) are depicted in Figure 12 and are described below:

1. Formalize the single-track trail connection from the gravel access road just east of the Big Canyon access gate along Back Bay Drive. In concert, restore native habitat over the

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several unauthorized and redundant connections that tie into this trail from the gravel road.

2. Formalize the single-track trail connection from the upper north bluff to the lower single track trail on state land. Enhancements can include the addition of stairs and/or railings for improved safety.
3. Extend single-track trails from the upstream ends of both the north and south maintenance roads in general line with the stream course.
4. Where appropriate, this plan recommends the construction of a crossing over Big Canyon creek near the rear of the canyon. This would connect the single-track trails described in bullet 3 above and create an authorized loop within the BCNP trail network.

Once these authorized connections are made, it is appropriate to close unauthorized trails and revegetate them with appropriate native plants. The installation of signs and fencing at the entrances of unauthorized trails may be installed during revegetation and maintained until a trail is no longer visible.

This plan also encourages the resurfacing of authorized roads and trails with decomposed granite or similar surface that is more attractive, more functional for recreational users, and less prone to erosion and weed growth. The chosen surface should be used throughout the authorized trail network in Big Canyon for the purposes of continuity and aesthetics.

The plan also encourages the creation of a hard surface lane (e.g. concrete) from the southwest entrance off Back Bay Drive to the southeast entrance off Jamboree Road to provide a functional connection through Big Canyon for road bike users. The hard surface lane could occupy half the width of the access road while the other half is surfaced with decomposed granite or similar natural surface. For safety purposes, lane lines and signage should be incorporated to appropriately orient multiple user groups (e.g. cyclists versus hikers).

The following measures for trail use can be implemented into the proposed BCNP trail system:

- Only authorized roads and trails will be permitted for public use. Encroachment off-trail into vegetated areas will be prohibited.
- Only authorized vehicles can access maintenance roads in order to minimize damage to roads and open space resources.
- Trail use shall be prohibited for appropriate periods (usually three days) following rains greater than 0.5 inch to avoid trail damage and impacts on adjacent habitat.

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- Trail use hours shall be posted as determined by the City of Newport Beach’s Recreation and Senior Services Department.
- Any unauthorized trails will be eliminated and impacted habitat restored.
- Trail use can be monitored through patrols and camera traps to manage off-trail use.

The following features can be included as part of a proposed trailhead:

- Fencing to designate trail boarders
- Kiosks with both informational and interpretative signage
- Benches and/or or informal gathering areas
- Trails can incorporate several overlook areas offering panoramic views where appropriate.
- Trail name and interpretive signage

Installation and maintenance of fencing (smooth wire cables and posts design as approved by City staff), is permitted along access roads and trails or parts thereof to help delineate the road more clearly. The fencing should not be a barrier to wildlife or land managers needing to access the park but should discourage unauthorized access by the public and limit encroachment from service vehicles and associated damage to roadside vegetation.

3.4.2 Visitor Resources and Signage

Vehicular Access and Parking

Vehicular access to the entrance of Big Canyon would continue to be provided via Back Bay Drive. A lockable vehicle access gate could continue to exist at this entrance to manage unauthorized, after-hours use and vandalism. No lockable gate exists at the entrance from Jamboree Road however, only an unsecured piece of chain link with a reflector. To better manage unauthorized vehicular use, this plan recommends the installation of a second lockable vehicle gate with a pedestrian opening at this entrance (see photo below for example). The pedestrian opening will permit hikers and bikers unobstructed access to BCNP but restrict unapproved vehicle use. The alignment of existing, authorized maintenance roads would be preserved. Future public use within the BCNP will continue to offer trails, vehicular areas, parking, and interpretative areas, as shown on Figure 12.



SOURCE: Google Imagery, 2015; County of Orange, 2014; IRC, 08/2014.



FIGURE 12
Proposed Recreation Enhancements

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Interpretive Area

This plan encourages the creation of a formal gathering area within the BCNP to support small student group or community activities that are compatible with and promote the conservation values of the park and the larger upper Newport Bay ecosystem. The gathering area could accommodate up to 100 visitors at one time. Shade structures could be erected to moderate sun exposure and often high, mid-day temperatures. Any structures that are part of the gathering area (e.g. seating, shade structures, etc.) however should not substantially distract visitors from the natural setting nor substantially impede views of natural resources (e.g. the Newport Bay estuary). For instance, the permanent installation of unnatural lighting should not be permitted. The gathering area could include informational and directional signage and a message board that provides a current listing of programs and events occurring throughout the Upper Newport Bay.

Proposed Interpretive Media

In addition to the central gathering area described above, resting and viewing areas with interpretive elements could be added along the authorized trail network to showcase key natural features and habitat restoration efforts. Interpretive nodes throughout the canyon may be incorporated into the new trail system, and could present colorful and user-friendly information on the diverse habitats and native plants and wildlife of Big Canyon, restoration of habitats, removal of invasive non-native plants, water quality improvements in Big Canyon Creek, use of natural and bioengineered filtration systems to clean up contaminated urban runoff, and other information about Upper Newport Bay.

The BCNP could integrate interpretive panels and the following interpretive media:

- Regulatory Signs – signs with clearly stated rules and regulations, with explanations presented in an interpretive tone.
- Orientation Panel – welcome panel with overview statement and a map of Big Canyon Creek within the context of the Newport Bay.
- Orientation Brochure – multifacility brochure that highlights education and interpretive (wildlife watching) opportunities at the Newport Bay, including Big Canyon, Back Bay Science Center, the Muth Center, and the Aquatic Center.
- Observation Deck with Scope – higher elevation architectural feature that serves as an interpretive node, or wildlife watching deck, positioned as a pullout along the trail. Here, a permanently mounted viewscope and flipbook field guide could enhance wildlife watching experiences.

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Restroom Facilities

There are currently no public restrooms within Big Canyon. The closest public restroom is located at the Muth Interpretive Center on the north side of the bay, several miles away. The education organization Inside the Outdoors stages portable toilets seasonally on the CDFW parking lot at the mouth of Big Canyon for use by their program participants. When these toilets are unlocked during programs, they receive heavy use by the general public, suggesting a strong desire for such facilities on a regular basis.

Up to four portable ADA accessible chemical toilets could be installed within the City owned portion of the park, preferably near the existing CDFW parking lot. Structures (e.g. wood posts) should be installed around toilets so that they blend well with the surrounding environment.

3.5 Proposed Management

Various land and resource management practices occur within the immediate vicinity of the BCNP. Urban land uses associated with the residential developments occur to the north and south of the BCNP. To the east, just on the other side of Jamboree Road, golf course management practices associated with the Big Canyon Country Club have been implemented since the 1970s. The upper portion of the BCNP is hydrologically connected to the Big Canyon Country Club. The Upper Newport Bay Ecological Reserve is situated immediately adjacent to the BCNP and managed by the CDFW as both Reserve and non-Reserve Open Space.

Management of the BCNP is intended to be consistent with the requirements of the Orange County Central-Coastal NCCP/HCP. Permitted public access and recreation uses are set forth in Section 5.8 of the Central-Coastal NCCP/HCP. The permitted uses were formulated with the assumption that public access, passive recreational uses, and development of future recreational facilities would be compatible with and permitted within the Reserve system (County of Orange 1996). A majority of the lands that comprise the current Reserve system were included by governmental agencies specifically for recreational purposes. Although the BCNP is not currently considered part of the Reserve system, it is identified as non-Reserve Open Space. This public open space area was not considered suitable for inclusion in the CSS management program due to a lack of significant CSS habitat, the absence of “target species.” However, Big Canyon was determined to provide “medium” habitat value.

The remainder of this section describes the permitted uses, accessibility, prohibited uses, recreational uses, infrastructure, special access permits, enforcement procedures, safety and security measures, and emergency procedures within the BCNP.

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3.5.1 Permitted Uses

The BCNP is intended to be managed to provide for public recreation in ways consistent with the preservation and conservation of its biological resources. Uses permitted within the BCNP are stated below and are consistent with the uses listed within the Central-Coastal NCCP/HCP in Section 5.3:

- Passive recreation activities such as walking, running, hiking, and nature interpretation
- Biking
- Leashed dogs
- Park and reserve administrative and interpretive facilities if deemed necessary
- Construction, operation, and maintenance of new facilities necessary to support permitted recreation uses.
- Maintenance and operation of existing infrastructure facilities consistent with the NCCP/HCP provisions.

The recreational use polices above are intended to be compatible with CSS protection. This will provide monitoring and management of such uses for habitat protection purposes. Public access shall be monitored by the respective reserve owner/managers consistent with the protocols established in Section 5.4 of the Central-Coastal NCCP/HCP and managed to avoid negative biological impacts within the BCNP.

3.5.2 Accessibility

Big Canyon has a relatively flat and moderately sloping floodplain with steeply sloping bluffs to the north and south. Elevations within BCNP ranges from below mean sea level at its western-most extent, where it intercepts with the Upper Newport Bay west of Back Bay Drive, to approximately 115 feet above mean sea level (AMSL) along the southern portion of Big Canyon. Although the central portion of Big Canyon is relatively flat, it moderately slopes from east (upstream) to west (downstream) to eventually flow into Upper Newport Bay. The eastern portion of the Big Canyon floodplain is approximately 50 feet AMSL, while the western portion of the Big Canyon floodplain is ranges between 15 and 20 feet AMSL east of Back Bay Drive.

As previously mentioned, Big Canyon is one of the primary access points to Upper Newport Bay and is frequently used by the public for recreation, wildlife observation and wetland-based educational activities. Hikers, joggers and bicyclists using BCNP tend to direct their activities along Back Bay Drive rather than explore the interior of the canyon. The proposed

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implementation of the BCNP loop trail and interpretive signage will invite visitors to learn more about the special resources within Big Canyon.

3.5.3 Prohibited Uses

In order to provide public recreation that ensures the preservation and conservation of Big Canyon's biological resources, the following recreational uses will likely be prohibited consistent with the provisions of the Central-Coastal NCCP/HCP:

- Use of natural surface trails shall be prohibited for appropriate periods following heavy rain
- Active sports facilities (baseball diamonds, soccer fields, tennis courts, etc.)
- Golf courses
- Stadiums, field houses, etc.
- Concert facilities or lighted outdoor amphitheaters
- Facilities requiring night lighting except for safety purposes
- Motorized recreation vehicle activities
- Other facilities that would significantly harm sensitive natural habitat or biological resources.

3.5.4 Operation and Access Strategies

Big Canyon is to have an operation and/or access strategy plan reflective of the approved RRMP. Implementation of an operation model and/or access strategies would be dependent upon the City's approval and funding. This RRMP allows the City to meet specific guidelines for management consistent with the NCCP provisions that address appropriate passive recreation and utility access.

Additionally, entry permits to Big Canyon will be administered on a case-by-case basis by the City through an application process. Any entity without access easements that are interested in working within the BCNP will need to obtain an entry permit. Entry permits are to be issued by the City or their land manager according to permit guidelines established and monitored by City staff and/or the land manager. Organizations that are anticipated to utilize entry permits could include the NCC, Inside the Outdoors, NBC, USGS, and the University of California Irvine (UCI).

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3.5.5 Recreational Uses

All recreational uses within the BCNP will be monitored to manage habitat protection and visitor safety. To monitor the level of human access within the BCNP over time, trail-counters and/or camera traps (see Enforcement Procedures below) may be installed. All recreational activities within the BCNP are intended to be consistent with the Central-Coastal NCCP/HCP guidelines, as well as the policies contained within the Recreation Element of the Newport Beach General Plan. Recreational uses that will be permitted are described above in Section 3.5.1.

3.5.6 Infrastructure

Public infrastructure that is essential for maintaining public health and safety or economic reasons is permitted within the BCNP, and is consistent with Section 5.9 of the Central-Coastal NCCP/HCP. The following permitted facilities include:

- Arterial and other identified roads
- Water lines, reservoirs and associated facilities (e.g., pump stations, pressure control facilities, and access roads), and regional water storage and treatment facilities
- Sewer lines and pump station
- Electric, telephone, cable televisions, and natural gas facilities
- Storm drain and flood control facilities
- Access roads, monitoring wells, and maintenance facilities.

As previously discussed, the existing upper canyon sewer maintenance road would be preserved and provided with improved erosion controls. The entrance from Jamboree Road to the existing maintenance road will be maintained to facilitate sewer line maintenance that is coordinated and compatible with public use. In addition, incidental repair and upgrade of existing facilities may occur when needed. Needed repairs and upgrades will be determined based on safety requirements and code compliance.

3.5.7 Enforcement Procedures

Enforcement procedures within the BCNP shall be enforced and guided under local, state, and federal laws. Routine patrol and enforcement performed by Newport Beach Park Patrol should be implemented by the City that would specifically focus on natural areas such as BCNP. This specific patrol and enforcement activity will help minimize damage to park resources. Because Big Canyon is both secluded and easily accessible, vandalism could be an issue and will require specific attention

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from law enforcement to address. Additionally, appropriate signage will be designed to specify proper behavior within the BCNP. Park Patrol citation authorization shall be based on City Code.

To assist enforcement efforts, as well as discourage illegal activity, the City (or its designated land manager) could install remote camera traps. Camera trap programs are used widely in the Nature Reserve, including Buck Gully to document both wildlife and illegal human activity. Remote cameras not only help monitor the level illegal activity but can help identify serious and/or repeat offenders that should be targeted in enforcement efforts.

3.5.8 Safety and Security Measures

The BCNP is an open space area and proper security measures will be incorporated into the design for the safety of the public. Appropriate signage will be designed to inform public users of the inherent dangers that are within the BCNP as well as the extreme fire hazard conditions. 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.

3.5.9 Emergency Procedures

It is expected that emergencies associated with infrastructure located within the BCNP will occur. In such cases, immediate repairs shall be permitted consistent with the City's policies and procedures to protect the public and the habitat within Big Canyon.

Emergencies that require immediate attention (e.g., pipeline breaks and downed power lines) shall be addressed as described below, consistent with the Central-Coastal Subregion NCCP/HCP Provisions:

- The affected agency shall enter the reserve and complete necessary repairs consistent with normal practices
- It will not be necessary for a biologist to be present
- The extent of disturbed area shall be determined upon completion of the repairs and revegetation plans prepared, implemented and monitored in accordance with the standards and requirements
- Revegetation shall be limited to the area determined to be disturbed.

If an emergency will require more than eight hours of preparation before disturbance of natural habitat occurs (e.g., water tank leak), the affected agency will delineate the area of disturbance

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and have a biologist map the resources present. This delineation will be the bases for the revegetation plans. The affected agency may use their biologist, or should the affected agency have no staff biologists, they may request the reserve manager to provide one.

3.6 Community Outreach and Education

3.6.1 Outreach and Education Plan

Community outreach and public education are important components of a RRMP. Public awareness of natural resources can foster a deeper appreciation for and understanding of nature and inspire new partnerships that strengthen the health and management of natural and recreational resources. Due to the location of Big Canyon and its urban surrounding, it is highly influenced by human activities; therefore, proper education to visitors and local residents can have real and beneficial impacts to biological resources within the BCNP. Thus, trails and interpretive facilities within the BCNP are to educate and increase environmental awareness and stewardship amongst residents within the community, school children in Orange County, as well as other public groups. Community outreach and public education programs are encouraged as part of the land management activities of the City or their land manager.

Outreach programs could target broad public audiences including schools and youth groups, outdoor and natural history enthusiasts, academic researchers, artists, and volunteers interested in docent training and land stewardship.

3.6.2 Docent and Volunteer Programs

Docent and volunteer programs provide necessary assistance and support to implement outreach and education programs. The BCNP will potentially utilize:

- Docents
- Trail and natural history guides
- Land stewards
- Collaborative volunteer programs

These resources and programs can provide the public with guided field trips and opportunities to carryout needed trail maintenance and habitat restoration. Docent-led programs provide the public with important information on the sensitivity of biological resources, as well as assist with the conservation and enhancement of natural resources. If the City implements a community

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outreach and education program, all docent and volunteers shall be designated through the City or their land manager.

3.7 Donation and Sponsorship Programs

During the period 2002 to 2008, the City received funding from the State Coastal Conservancy, as well as support from Community Conservancy International (CCI), Newport Bay Naturalists and Friends (NBNF), and Community Conservation Solutions (CCS) to assess needs and develop a restoration plan.

In 2010, NBNF proposed to incorporate improvements to Big Canyon by incorporating a mixture of contractor-based and community-based approaches (NBNF 2010). Contractor-based activities include spillway construction requiring detailed engineering and site preparation for native plant plantings. Community-based activities to date in BCNP have ranged from Eagle Scout projects (i.e. construction of kiosks) to education programs such as those offered by Inside the Outdoor to native planting efforts by members of the public during IRC's monthly community-based restoration events. These programs are integral in the preservation of Big Canyon.

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4 CULTURAL, PHYSICAL AND NATURAL RESOURCES MANAGEMENT

4.1 Cultural Resources

As discussed in Section 2.4, The City of Newport Beach contains a rich and diverse historic past. If cultural resources are found during any activities conducted in BCNP, they will be preserved and protected. Methods to reduce risks of vandalism and looting may include the inventory and periodic monitoring of all known resources, screening vegetation to reduce the likelihood of trespass and damage, and master planning to reduce conflicts with known resources.

4.2 Fuel Management

The City of Newport Beach identifies some of the properties adjacent to BCNP as Hazard Reduction Zones (HRZ) (Figure 6), although this area falls outside of any City-defined Very High Fire Hazard Severity Zone. Given the HRZ classification of adjacent properties, the area between BCNP and the Park Newport Apartments and structures along Amigos Way and Domingo Drive would be considered a wildland-urban interface area at risk of wildfire. Fire management policies specified by the LCP include:

- Application of hazard reduction and other methods in urban-wildland interface areas
- Use of fire-resistant native plants from the City-approved plant list in fuel modification zones adjacent to sensitive habitat
- Prohibition of invasive ornamental plant species in fuel modification zones adjacent to sensitive habitat (City of Newport Beach 2004).

Vegetation management within the HRZ has historically been conducted within BCNP in key areas under direction from the Nbfd. The HRZ occurring within BCNP (approximately 4.89 acres) is expected to receive annual treatment by the City via its maintenance contractor.

4.3 Wildlife Habitat Management

A variety of wildlife species utilize Big Canyon for its resources; therefore, maintaining and preserving these resources are a key component of the RRMP. The Central-Coastal Subregion NCCP/HCP has set forth active management and monitoring programs within the Reserve; however, there are no general wildlife management objectives or measures for non-Reserve Open Spaces like the BCNP. Additionally, Big Canyon is not within a designated habitat linkage of the Reserve system even though it provides important habitat and refugia for a variety of

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wildlife species. Regardless, wildlife and habitat management elements proposed in this RRMP are consistent with provisions of the Central-Coastal Subregion NCCP/HCP.

The City's enforcement of vegetative hazard reduction adjacent to BCNP promotes the maintenance of vegetation adjacent to structures and the presence of low fire-risk species in hazard reduction zones. This effort helps to minimize edge effect and routine removal of invasive species also reduces pressure on native vegetation and wildlife.

4.4 Water Quality Management

Big Canyon Creek and its tributaries provide critical resources for wildlife and is an integral part of the larger Upper Newport Bay ecosystem, providing fresh water inflow to Upper Newport Bay (an estuary designated a Critical Coastal Area; CCA #69). Enhancing and maintaining the integrity of these aquatic resources is a key component of the RRMP. To address these concerns over water quality within and out of Big Canyon Creek, the following goals have been established:

- Establish a comprehensive integrated, ongoing monitoring program for Big Canyon that addresses habitat, wildlife, water quality, public use and edge effects, meeting regulatory requirements and/or permit conditions for pre-construction, construction and post-construction monitoring (NBNF 2010)
- Address polluted runoff in Big Canyon Creek, as well as provide provisions for a selenium treatment system to be installed at the stream entry into Big Canyon Nature Park (inside the project area, west of Jamboree Road) (NBNF 2010)
- Incorporate water quality education and BMPs into interpretive elements
- Collaborate on water quality monitoring efforts to track point- and non-point source pollutants, with a primary focus on reducing the level of selenium flowing through the BCNP to Upper Newport Bay
- Identify potential funding sources and mechanisms
- Coordinate with Newport Bay Conservancy and other interested parties to integrate restoration planning and implementation and recognize on-going regulatory programs to address water quality in Big Canyon.
- Ensure that BCNP management activities do not detrimentally affect existing water quality conditions

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Controlling erosion is an especially important task for protecting water quality. In order to reduce the impacts of erosion within BCNP, barren areas should be revegetated with native vegetation. Unauthorized trails located along the northern bluffs of the canyon have led to significant habitat disturbance and erosion; thus, the public use should be limited to authorized trails. Proper grading, drainage, detention, and planting should also control chronic flooding and erosion problems within BCNP. These measures would minimize erosion throughout portions of the BCNP and reduce impacts to riparian habitat and water quality to the Big Canyon Creek.

4.5 Habitat Restoration, Enhancement, and Mitigation

One of the main goals of this RRMP is to lay a framework for improving the habitat value of Big Canyon. As discussed in Section 2.3 (Existing Conditions), the ecology of Big Canyon has been impacted by changes to the areas hydrology (e.g. increased urban runoff), land use (e.g. grading and stock piling of dredge spoils) and vegetation (e.g. the establishment of invasive species). Consequently, there are numerous opportunities to enhance the existing environment through targeted invasive removal and habitat restoration. The restoration and enhancement of native vegetation will provide more quality habitat to promote native biodiversity, improve water quality throughout Big Canyon, and improve connectivity among wildlife populations in the greater upper Newport Bay ecosystem. Enhancements to habitat will also increase Big Canyon's value as a recreational resource and as a destination for the public to learn about the ecology and natural history of the entire Newport Bay.

Although Big Canyon is not currently within the Central-Coastal NCCP/HCP Reserve System, this RRMP is consistent with the guidelines for habitat restoration and enhancement provided within the Central-Coastal NCCP/HCP Reserve System in the event that the BCNP is accepted into the Reserve System at a future date. Priorities for habitat restoration and enhancement within the Central-Coastal NCCP/HCP (stated in Section 5.6.1) are listed below in order of importance:

- Invasive species control and management
- Creation of new habitat will focus on disturbed (non-wildland) areas
- Management of public access
- Restore and enhance degraded wildland areas, especially coastal scrub
- Other restoration activities in other habitat types

The concept plan developed by the City and its partners in 2014 included several recommendations for enhancing habitat value of Big Canyon which are consistent with the

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priorities outlined in the Central-Coastal NCCP/HCP above. Accordingly, this RRMP encourages the following specific enhancements:

1. In degraded upland areas with topsoil composed largely of dredge spoils, establish drought and salt-tolerant native vegetation communities. A mosaic of scrub and alkaline meadow species is appropriate depending on soil conditions. A number of salt tolerant native species currently occupy these areas. These populations should be conserved and given space to expand.
2. In mesic areas dominated by exotic trees (e.g. Brazilian peppertree, shamel ash, lollipop trees adjacent to Big Canyon Creek) establish native riparian forest through plantings, cuttings, and appropriate seed mixes. It may be appropriate to grade heavily incised stream banks before planting native trees in order to slow and disperse surface flows.
3. In riparian forest areas dominated by native tree species (e.g. willows) but containing substantial exotic vegetation as well, conduct targeted invasive removal. Depending on the size of the infestation, revegetation with native plantings or seed may be appropriate.
4. To address the substantial management issues concerning the freshwater wetlands at the mouth of Big Canyon, including the prevalence of mosquito-breeding habitat, exotic species, selenium toxicity, water pollution, and sedimentation, the plan recommends the filling of the ponds and replacement with riparian forest or scrubland. Such projects would require prior approval from the state and CDFW respectively as well as other resource agencies.
5. Revegetate unauthorized trails with appropriate native plants
6. Use locally sourced plant materials to the extent practicable (preferably coastal Orange County)
7. Incorporate quality salvaged top soil and plant materials if available and suitable
8. Install appropriate signage in areas undergoing restoration to discourage encroachment by the public into sensitive, unauthorized areas.
9. Leverage volunteer assistance in habitat enhancement activities where appropriate. Providing opportunities for public involvement encourages community engagement and awareness of environmental issues affecting Big Canyon and Newport Bay in general.

Figure 13 illustrates the core set of proposed improvements to natural and recreational resources in Big Canyon.



Vegetation Community Type

- Restored Coastal Sage Scrub Habitat
- Restored Coastal Sage Scrub/Alkaline Meadow Habitat
- Constructed Treatment Wetland*
- Exotic Plant Removal and Restoration
- Restored Grassland Habitat
- Hazard Reduction Area (Fuel Management)
- Existing Natural Vegetation/Land Cover
- Restored Riparian Forest Habitat
- Restored Wet Meadow Habitat
- Revegetation of Unauthorized Trails
- Big Canyon Creek
- Study Area
- Big Canyon Nature Park

*The location of enhancements are subject to revision by the City

SOURCE: Google Imagery, 2015; County of Orange, 2014; IRC, 08/2014.



FIGURE 13
Proposed Natural Resource Enhancements

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5 MONITORING AND ADAPTIVE MANAGEMENT

Although Big Canyon is not part of the NCCP/HCP Reserve system, adaptive management research and monitoring, activities have been prepared at a level of detail consistent with the goals of the Central-Coastal Subregion NCCP/HCP should the City enroll Big Canyon into the Reserve system in the future. Thus, this RRMP has been developed with a focus on restoration and enhancement of existing natural habitat areas within the BCNP, taking into consideration the information and guidelines provided within the *Habitat Restoration and Enhancement Plan* (LSA 2003).

Additionally, the monitoring and resource management protocols identified to successfully restore and maintain Big Canyon should be readily expandable to meet the needs of other local adaptive management programs such as the Comprehensive Resource Management Project (CRMP). Since 2001, the NBC has established an Upper Newport Bay Management Coalition Cooperative Policy and continually developed this project for the CDFW Ecological Reserve, the Orange County Parks Nature Preserve, and the City of Newport Beach open space at Upper Newport Bay. Eventually, the CRMP will establish specific objectives for the long-term protection of native habitat and wildlife, and specify how best to achieve those objectives through adaptive management systems and processes.

If the BCNP is submitted and accepted into the NROC Reserve System, then the City or their reserve manager, is responsible for the following activities consistent with that stipulated in the Central-Coastal NCCP/HCP Implementing Agreement:

- Coordinate management activities with Natural Communities Coalition (NCC) and ensure activities are consistent with the annually-approved Work Plan.
- Prepare a work program component for the landowner for the following year's activities.
- Provide an annual progress report to NCC on the current year work program for inclusion in the NCC Annual Report submitted to CDFW and USFWS.
- Conduct specific Adaptive Management activities within the BCNP described in the current work program including restoration, enhancement, habitat management, public access/recreational management, facility maintenance, cooperation in fire management and cooperation in control of invasive plant and animal species. The City's land manager may allow NCC or other appropriate public agencies or nonprofits the ability to carry out the adaptive measures.

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Two critical components of the habitat management program are monitoring and adaptive management. If the BCNP is submitted and accepted into the NROC Reserve System, then the following will apply:

5.1 Coordination with NCC Plans

The Central-Coastal Subregion NCCP/HCP AMP is intended to facilitate long-term, no net loss of habitat value within the Reserve. Adaptive management is defined as a flexible, iterative approach to the long-term management of biotic resources directed overtime by the results of ongoing monitoring activities and other information (County of Orange 1996). Management techniques and objectives of the City's land manager would be modified over time based on monitoring results to ensure the Central-Coastal NCCP/HCP overall management goals are achieved. IRC would implement the adaptive management program in coordination with the NCC to successfully conserve CSS habitat values for native plant and wildlife species.

5.2 Annual Progress Report

The responsible land manager of BCNP will submit an annual report to the Executive Director of NCC for inclusion into the Annual Report submitted to the USFWS and CDFW. In order to comply with NCC's annual reporting requirements, reports from the land manger shall include at a minimum the following information within an annual progress report:

- The results of natural resource monitoring (e.g. outcomes of focused plant and wildlife surveys, invasive species monitoring and treatment efforts, etc.)
- The results of public access and recreational use monitoring (e.g. trail conditions, estimated number of trail users, adverse habitat impacts, enforcement actions, etc.)
- Specific recommendations involving modifications to existing management practices to minimize adverse impacts on biologic resources resulting from recreation use (e.g. closing a section of trail temporarily because of sensitive breeding activity)
- Recommendations to initiate new management programs in response to changing circumstances or conditions (educational programs, trail patrols, trail counters, camera trap program, etc.).

In addition, the land manager will provide relevant information and data that may contribute to the following requirements of NCC for the Annual Report submitted to CDFW and USFWS:

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1. Recommendations for modifications to management policies and program consistent with AMP
2. Management program/budgets for the following year and funding recommendations and priorities
3. Updates to the previous year budget
4. Summaries of activities implemented by Reserve managers, including number of volunteer (public and private) events held.
5. Locations and quantities of species “take” and habitat loss that occurred in the Reserve during the previous year
6. Restoration and enhancement actions
7. Locations and quantities of species “take” and habitat loss that occurred outside the Reserve during the previous year, including accounting for any applicable mitigation fees
8. Summary of all other funds received and dispersed to participating agencies for management and acquisition activities related to the Central-Coastal Subregion NCCP/HCP
9. Summary of land added to the Reserve System.

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APPENDIX A

*Covered and Conditionally Covered Species under
the Central-Coastal NCCP/HCP*

APPENDIX A
Covered and Conditionally Covered Species
under the Central-Coastal NCCP/HCP

Table A-1
Species Authorized for Take by the NCCP/HCP
and United States Fish and Wildlife Service 10(A)(1)(B)
Permits (Identified [“Covered”] Species)

Amphibians
Western spadefoot toad (<i>Scaphiopus hammondi</i>) (in Coastal Subregion Only)
Arboreal salamander (<i>Aneides lugubris</i>)
Black-bellied slender salamander (<i>Batrachoseps nigriventris</i>)
Reptiles
Coastal rosy boa (<i>Charina [Lichanura] trivirgata roseofusca</i>)
Coastal western whiptail (<i>Aspidoscelis [Cnemidophorus] tigris stejnegeri</i>)
Coronado skink (<i>Eumeces skiltonianus interparietalis</i>)
Orange-throated whiptail (<i>Aspidoscelis [Cnemidophorus] hyperythra beldingi</i>)
Northern red-diamond rattlesnake (<i>Crotalus ruber ruber</i>)
San Bernardino ringneck snake (<i>Diadophis punctatus modestus</i>)
San Diego horned lizard (<i>Phrynosoma coronatum</i> , the “blainvillei” population)
Avifauna
Coastal California gnatcatcher (<i>Polioptila californica californica</i>)
Coastal cactus wren (<i>Campylorhynchus brunneicapillus couesi</i>)
Peregrine falcon (<i>Falco peregrinus</i>)
Northern harrier (<i>Circus cyaneus</i>)
Red-shouldered hawk (<i>Buteo lineatus</i>)
Rough-legged hawk (<i>Buteo lagopus</i>)
Sharp-shinned hawk (<i>Accipiter striatus</i>)
Southern California rufous-crowned sparrow (<i>Aimophila ruficeps canescens</i>)
Mammals
Coyote (<i>Canis latrans</i>)
Gray fox (<i>Urocyon cinereoargenteus</i>)
San Diego desert woodrat (<i>Neotoma lepida intermedia</i>)
Plants
Catalina mariposa lily (<i>Calochortus catalinae</i>)
Coulter’s matilija poppy (<i>Romneya coulteri</i>)
Heart-leaved pitcher sage (<i>Lepechinia cardiophylla</i>)
Laguna Beach dudleya (<i>Dudleya stolonifera</i>)
Nuttall’s scrub oak (<i>Quercus dumosa</i>)
Santa Monica Mountains dudleya (<i>Dudleya cymosa</i> ssp. <i>ovatifolia</i>)
Small-flowered mountain mahogany (<i>Cercocarpus minutifolia</i>)
Tecate cypress (<i>Cupressus forbesii</i>)

APPENDIX A (Continued)

Table A-2
Species Authorized for Take by the NCCP/HCP
and United States Fish and Wildlife Service 10(A)(1)(B) Permits
(Identified [“Conditionally Covered”] Species)

Amphibians
<i>Arroyo toad (Bufo californicus)</i>
Invertebrates
<i>Quino checkerspot butterfly (Euphydryas editha quino)</i>
<i>San Diego fairy shrimp (Branchinecta sandiegonensis)</i>
<i>Riverside fairy shrimp (Streptocephalus woottoni)</i>
Avifauna
<i>Golden eagle (Aquila chrysaetos)</i>
<i>Prairie falcon (Falco mexicanus)</i>
<i>Southwestern willow flycatcher (Empidonax traillii extimus)</i>
<i>Least Bell's vireo (Vireo bellii pusillus)</i>
Mammals
<i>Pacific pocket mouse (Perognathus longimembris pacificus)</i>
Plants
<i>Foothill (intermediate) mariposa lily (Calochortus weedii var. intermedius)</i>

APPENDIX B

Plant Species within the BCNP

APPENDIX B

Plant Species within the BCNP

VASCULAR SPECIES

MONOCOTS

AGAVACEA—AGAVE FAMILY

Agave decipiens—false sisal

ARECACEAE—PALM FAMILY

Phoenix canariensis—Canary Island date palm

Washingtonia robusta—Washington fan palm

ASPARAGACEAE—ASPARAGUS FAMILY

Asparagus aethiopicus—no common name

ASPHODELACEAE—ASPHODEL FAMILY

Aloe maculata—no common name

Aloe arborescens—candelabra aloe

CYPERACEAE—SEDGE FAMILY

Bolboschoenus maritimus ssp. *paludosus*—cosmopolitan bulrush

Bolboschoenus robustus—sturdy bulrush

Cyperus eragrostis—tall flatsedge

Cyperus involucratus—umbrella plant

Eleocharis palustris—common spikerush

Isolepis cernua—low bulrush

Schoenoplectus americanus—chairmaker's bulrush

Schoenoplectus californicus—California bulrush

JUNCACEAE—RUSH FAMILY

Juncus acutus ssp. *leopoldii*—Leopold's rush

Juncus bufonius—toad bulrush

JUNCAGINACEAE—ARROW-GRASS FAMILY

Triglochin maritima—seaside arrowgrass

POACEAE—GRASS FAMILY

Avena barbata—slender oat

Avena fatua—wild oat

Brachypodium distachyon—purple false brome

Bromus catharticus—rescuegrass

APPENDIX B (Continued)

Bromus diandrus—ripgut brome
Bromus hordeaceus—soft brome
Bromus madritensis ssp. *rubens*—red brome
Cortaderia selloana—Uruguayan pampas grass
Cynodon dactylon—Bermudagrass
Distichlis littoralis—shoregrass
Distichlis spicata—saltgrass
Echinochloa crus-galli—barnyardgrass
Elymus condensatus—giant wildrye
Elymus triticoides—beardless wildrye
Festuca myuros—rat-tail fescue
Festuca perennis—Italian ryegrass
Hordeum murinum ssp. *leporinum*—hare barley
Lamarckia aurea—goldentop grass
Melica imperfecta—smallflower melicgrass
Parapholis incurva—curved sicklegrass
Pennisetum villosum—feathertop
Poa annua—annual bluegrass
Polypogon monspeliensis—annual rabbitsfoot grass
Polypogon viridis—beardless rabbitsfoot grass
Schismus barbatus—common Mediterranean grass
Stenotaphrum secundatum—St. Augustine grass
Stipa lepida—foothill needlegrass
Stipa miliacea var. *miliacea*—smilgrass

TYPHACEAE—CATTAIL FAMILY

Typha domingensis—southern cattail
Typha latifolia—broadleaf cattail

FERNS AND FERN ALLIES

AZOLLACEAE—MOSQUITO FERN FAMILY

Azolla filiculoides—Pacific mosquitofern

GYMNOSPERMS AND GNETOPHYTES

PINACEAE—PINE FAMILY

Pinus halepensis—Aleppo pine

APPENDIX B (Continued)

EUDICOTS

ADOXACEAE—MUSKROOT FAMILY

Sambucus nigra ssp. *caerulea*—blue elderberry

AIZOACEAE—FIG-MARIGOLD FAMILY

Carpobrotus chilensis—sea fig

Carpobrotus edulis—hottentot fig

Malephora crocea—coppery mesemb

Mesembryanthemum crystallinum—common iceplant

Mesembryanthemum nodiflorum—slenderleaf iceplant

Lampranthus aurantiacus—trailing iceplant

AMARANTHACEAE—AMARANTH FAMILY

Amaranthus albus—prostrate pigweed

ANACARDIACEAE—SUMAC OR CASHEW FAMILY

Malosma laurina—laurel sumac

Rhus integrifolia—lemonade sumac

Schinus terebinthifolius—Brazilian peppertree

Toxicodendron diversilobum—Pacific poison oak

APIACEAE—CARROT FAMILY

Anthriscus caucalis—bur chervil

Apium graveolens—wild celery

Conium maculatum—poison hemlock

Daucus pusillus—American wild carrot

Foeniculum vulgare—sweet fennel

APOCYNACEAE—DOGBANE FAMILY

Nerium oleander—oleander

Vinca major—bigleaf periwinkle

ARALIACEAE—GINSENG FAMILY

Hedera canariensis—Algerian ivy

Hedera helix—English ivy

ASTERACEAE—SUNFLOWER FAMILY

Ambrosia psilostachya—Cuman ragweed

Artemisia californica—coastal sagebrush

Artemisia douglasiana—Douglas' sagewort

APPENDIX B (Continued)

Artemisia dracunculus—tarragon
Baccharis pilularis ssp. *consanguinea*—coyotebrush
Baccharis salicifolia ssp. *salicifolia*—mulefat
Baccharis salicina—willow baccharis
Carduus pycnocephalus—Italian plumeless thistle
Centaurea melitensis—Maltese star-thistle
Centromadia parryi ssp. *australis*—pappose tarweed
Cirsium vulgare—bull thistle
Corethrogyne filaginifolia—common sandaster
Corethrogyne filaginifolia var. *virgata*—virgate sand aster
Cotula australis—Australian waterbuttons
Cotula coronopifolia—common brassbuttons
Cynara cardunculus—cardoon
Deinandra fasciculata—clustered tarweed
Dimorphotheca ecklonis—blue and white daisybush
Dimorphotheca fruticosa—shrubby daisybush
Encelia californica—California brittlebush
Erigeron bonariensis—asthmaweed
Erigeron canadensis—Canadian horseweed
Euthamia occidentalis—western goldentop
Gazania linearis—treasureflower
Glebionis coronaria—crowndaisy
Helminthotheca echioides—bristly oxtongue
Heterotheca grandiflora—telegraphweed
Hypochaeris glabra—smooth cat's ear
Isocoma menziesii var. *menziesii*—Menzies' goldenbush
Isocoma menziesii var. *vernonioides*—Menzies' goldenbush
Jaumea carnosa—marsh jaumea
Lactuca serriola—prickly lettuce
Laennecia coulteri—Coulter's horseweed
Logfia gallica—narrowleaf cottonrose
Malacothrix saxatilis—cliff desertydandelion
Matricaria discoidea—disc mayweed
Pluchea odorata var. *odorata*—sweetscent
Pseudognaphalium biolettii—two-color rabbit-tobacco
Pseudognaphalium luteoalbum—Jersey cudweed
Pseudognaphalium stramineum—cottonbatting plant
Pulicaria paludosa—Spanish false fleabane
Senecio vulgaris—old-man-in-the-Spring

APPENDIX B (Continued)

Silybum marianum—blessed milkthistle
Sonchus asper—spiny sowthistle
Sonchus oleraceus—common sowthistle
Stephanomeria virgata—rod wirelettuce
Xanthium strumarium—rough cocklebur
Volutaria tubuliflora—Mediterranean desert knapweed

BATACEAE—SALTWORT FAMILY

Batis maritima—turtleweed

BIGNONIACEAE—BIGNONIA FAMILY

Tecoma capensis—Cape honeysuckle

BORAGINACEAE—BORAGE FAMILY

Amsinckia menziesii—Menzies' fiddleneck
Cryptantha intermedia—Clearwater cryptantha
Echium candicans—pride of Madeira
Eucrypta chrysanthemifolia—spotted hideseed
Heliotropium curassavicum var. *oculatum*—seaside heliotrope

BRASSICACEAE—MUSTARD FAMILY

Brassica nigra—black mustard
Brassica rapa—field mustard
Capsella bursa-pastoris—shepherd's purse
Descurainia pinnata—western tansymustard
Hirschfeldia incana—shortpod mustard
Lepidium didymum—lesser swinecress
Lepidium lasiocarpum ssp. *lasiocarpum*—shaggyfruit pepperweed
Lepidium nitidum—shining pepperweed
Lobularia maritima—sweet alyssum
Nasturtium officinale—watercress
Raphanus sativus—cultivated radish
Sisymbrium altissimum—tall tumbled mustard
Sisymbrium irio—London rocket
Sisymbrium orientale—Indian hedgemustard

CACTACEAE—CACTUS FAMILY

Cylindropuntia prolifera—coastal cholla
Opuntia littoralis—coastal pricklypear
Opuntia oricola—chaparral pricklypear

APPENDIX B (Continued)

Opuntia xoccidentalis—western prickly pear

CAPRIFOLIACEAE—HONEYSUCKLE FAMILY

Lonicera laponica—Japanese honeysuckle

CARYOPHYLLACEAE—PINK FAMILY

Polycarpon tetraphyllum—fourleaf manyseed

Silene gallica—common catchfly

Spergularia marina—salt sandspurry

CHENOPODIACEAE—GOOSEFOOT FAMILY

Arthrocnemum subterminale—Parish's glasswort

Atriplex amnicola—swamp saltbush

Atriplex canescens var. *canescens*—fourwing saltbush

Atriplex glauca—waxy saltbush

Atriplex lentiformis—big saltbush

Atriplex prostrata—triangle orache

Atriplex semibaccata—Australian saltbush

Atriplex suberecta—peregrine saltbush

Bassia hyssopifolia—fivehorn smotherweed

Beta vulgaris—common beet

Chenopodium album—lambsquarters

Chenopodium macrospermum—largeseed goosefoot

Chenopodium murale—nettleleaf goosefoot

Dysphania ambrosioides—Mexican tea

Salicornia pacifica—Pacific swampfire

Salsola tragus—prickly Russian thistle

Suaeda esteroa—seablite

Suaeda taxifolia—woolly seablite

CLEOMACEAE—CLEOME FAMILY

Peritoma arborea—bladderpod spiderflower

CONVOLVULACEAE—MORNING-GLORY FAMILY

Convolvulus arvensis—field bindweed

Cressa truxillensis—spreading alkaliweed

Cuscuta salina—saltmarsh dodder

CRASSULACEAE—STONECROP FAMILY

Crassula connata—sand pygmyweed

APPENDIX B (Continued)

Crassula ovata—jade plant

Dudleya lanceolata—lanceleaf liveforever

Sedum praealtum—green cockscomb

CUCURBITACEAE—GOURD FAMILY

Cucurbita foetidissima—Missouri gourd

Marah macrocarpa—Cucamonga manroot

EUPHORBIACEAE—SPURGE FAMILY

Croton setiger—dove weed

Euphorbia maculata—spotted sandmat

Euphorbia peplus—petty spurge

Euphorbia polycarpa—smallseed sandmat

Ricinus communis—castorbean

FABACEAE—LEGUME FAMILY

Acacia longifolia—Sydney golden wattle

Acacia melanoxylon—blackwood

Acacia redolens—bank catclaw

Acacia retinodes—water wattle

Acacia saligna—orange wattle

Acmispon glaber var. *glaber*—common deerweed

Lupinus succulentus—hollowleaf annual lupine

Medicago polymorpha—burclover

Melilotus albus—yellow sweetclover

Melilotus indicus—annual yellow sweetclover

FAGACEAE—OAK FAMILY

Quercus agrifolia var. *agrifolia*—California live oak

FRANKENIACEAE—FRANKENIA FAMILY

Frankenia salina—alkali seaheath

GERANIACEAE—GERANIUM FAMILY

Erodium cicutarium—redstem stork'sbill

Erodium moschatum—musky stork's bill

Geranium californicum—California cranesbill

GROSSULARIACEAE—GOOSEBERRY FAMILY

Ribes quercetorum—rock gooseberry

Ribes speciosum—fuchsiaflower gooseberry

APPENDIX B (Continued)

LAMIACEAE—MINT FAMILY

Marrubium vulgare—horehound

Salvia mellifera—black sage

MALVACEAE—MALLOW FAMILY

Malva parviflora—cheeseweed mallow

MORACEAE—MULBERRY FAMILY

Ficus sp.—fig

MYRSINACEAE—MYRSINE FAMILY

Lysimachia arvensis—scarlet pimpernel

MYRTACEAE—MYRTLE FAMILY

Eucalyptus camaldulensis—river redgum

Eucalyptus polyanthemos—redbox

Eucalyptus sideroxylon—red ironbark

Melaleuca viminalis—weeping bottlebrush

NYCTAGINACEAE—FOUR O’CLOCK FAMILY

Mirabilis laevis—desert wishbone-bush

OLEACEAE—OLIVE FAMILY

Fraxinus uhdei—Shamel ash

ONAGRACEAE—EVENING PRIMROSE FAMILY

Camissoniopsis cheiranthifolia—beach suncup

Epilobium canum ssp. *canum*—hummingbird trumpet

Oenothera elata ssp. *hirsutissima*—Hooker's evening primrose

OROBANCHACEAE—BROOM-RAPE FAMILY

Chloropyron maritimum ssp. *maritimum*—salt marsh bird's-beak

Cordylanthus rigidus ssp. *setiger*—no common name

OXALIDACEAE—OXALIS FAMILY

Oxalis pes-caprae—Bermuda buttercup

PHRYMACEAE—LOPSEED FAMILY

Mimulus aurantiacus var. *pubescens*—orange bush monkeyflower

PLANTAGINACEAE—PLANTAIN FAMILY

Antirrhinum nuttallianum—violet snapdragon

APPENDIX B (Continued)

Keckiella cordifolia—heartleaf keckiella

Plantago major—common plantain

PLATANACEAE—PLANE TREE, SYCAMORE FAMILY

Platanus racemosa—California sycamore

PLUMBAGINACEAE—LEADWORT FAMILY

Limonium binervosum—rock sea-lavender

Limonium ramosissimum—Algerian sea lavender

Limonium sinuatum—wavyleaf sea lavender

POLYGONACEAE—BUCKWHEAT FAMILY

Eriogonum fasciculatum var. *fasciculatum*—Eastern Mojave buckwheat

Persicaria lapathifolia—curlytop knotweed

Polygonum argyrocoleon—silversheath knotweed

Rumex crispus—curly dock

PORTULACACEAE—PURSLANE FAMILY

Portulaca oleracea—little hogweed

PROTEACEAE—PROTEA FAMILY

Grevillea robusta—silkoak

RHAMNACEAE—BUCKTHORN FAMILY

Rhamnus alaternus—Italian buckhorn

ROSACEAE—ROSE FAMILY

Eriobotrya japonica—loquat

Heteromeles arbutifolia—toyon

Prunus persica—peach

Rosa californica—California wildrose

Rubus armeniacus—Himalayan blackberry

Rubus ursinus—California blackberry

RUBIACEAE—MADDER FAMILY

Galium aparine—stickywilly

SALICACEAE—WILLOW FAMILY

Populus fremontii—Fremont cottonwood

Salix gooddingii—Goodding's willow

Salix lasiolepis—arroyo willow

APPENDIX B (Continued)

SAPINDACEAE—SOAPBERRY FAMILY

Koelreuteria paniculata—goldenrain tree

Koelreuteria bipinnata—Chinese flame tree

SAURURACEAE—LIZARD'S-TAIL FAMILY

Anemopsis californica—yerba mansa

SCROPHULARIACEAE—FIGWORT FAMILY

Myoporum laetum—ngaio tree

Scrophularia californica—California figwort

SOLANACEAE—NIGHTSHADE FAMILY

Datura wrightii—sacred thorn-apple

Lycium californicum—California desert-thorn

Nicotiana glauca—tree tobacco

Solanum americanum—American black nightshade

Solanum douglasii—greenspot nightshade

TAMARICACEAE—TAMARISK FAMILY

Tamarix ramosissima—saltcedar

TROPAEOLACEAE—NASTURTIUM FAMILY

Tropaeolum majus—nasturtium

URTICACEAE—NETTLE FAMILY

Hesperocnide tenella—western stingingnettle

Urtica dioica ssp. *holosericea*—stinging nettle

Urtica urens—dwarf nettle

VERBENACEAE—VERVAIN FAMILY

Lantana camara—lantana

Verbena lasiostachys var. *lasiostachys*—western vervain

APPENDIX C

Wildlife Species within the BCNP

APPENDIX C
Wildlife Species within the BCNP

AMPHIBIAN

FROGS

RANIDAE—TONGUELESS FROGS

- * *Xenopus laevis*—African clawed frog
- * *Lithobates catesbeianus*—American bullfrog

HYLIDAE—TREEFROGS

Pseudacris hypochondriaca—Baja California treefrog

BIRD

BLACKBIRDS, ORIOLES AND ALLIES

ICTERIDAE—BLACKBIRDS

Agelaius phoeniceus—red-winged blackbird
Euphagus cyanocephalus—Brewer's blackbird
Quiscalus mexicanus—great-tailed grackle
Icterus cucullatus—hooded oriole

BUSHTITS

AEGITHALIDAE—LONG-TAILED TITS AND BUSHTITS

Psaltriparus minimus—bushtit

CARDINALS, GROSBEAKS AND ALLIES

CARDINALIDAE—CARDINALS AND ALLIES

Pheucticus melanocephalus—black-headed grosbeak

EMBERIZINES

EMBERIZIDAE—EMBERIZIDS

Ammodramus savannarum—grasshopper sparrow
Junco hyemalis—dark-eyed junco
Melospiza melodia—song sparrow
Melospiza crissalis—California towhee
Passerculus sandwichensis beldingi—Belding's savannah sparrow
Passerella iliaca—fox sparrow

APPENDIX C (Continued)

Pipilo maculatus—spotted towhee
Spizella passerina—chipping sparrow
Zonotrichia atricapilla—golden-crowned sparrow
Zonotrichia leucophrys—white-crowned sparrow

FALCONS

FALCONIDAE—CARACARAS AND FALCONS

Falco peregrinus anatum—American peregrine falcon
Falco sparverius—American kestrel

FINCHES

FRINGILLIDAE—FRINGILLINE AND CARDUELINE FINCHES AND ALLIES

Carpodacus mexicanus—house finch
Spinus psaltria—lesser goldfinch
Spinus tristis—American goldfinch

FLYCATCHERS

TYRANNIDAE—TYRANT FLYCATCHERS

Empidonax difficilis—Pacific-slope flycatcher
Myiarchus cinerascens—ash-throated flycatcher
Sayornis nigricans—black phoebe
Sayornis saya—Say's phoebe
Tyrannus verticalis—western kingbird
Tyrannus vociferans—Cassin's kingbird

GREBES

PODICIPEDIDAE—GREBES

Aechmophorus occidentalis—western grebe
Podiceps nigricollis—eared grebe
Podilymbus podiceps—pied-billed grebe

HAWKS

ACCIPITRIDAE—HAWKS, KITES, EAGLES, AND ALLIES

Accipiter striatus—sharp-shinned hawk
Buteo jamaicensis—red-tailed hawk
Buteo lineatus—red-shouldered hawk

APPENDIX C (Continued)

Circus cyaneus—northern harrier
Elanus leucurus—white-tailed kite
Pandion haliaetus—osprey

HERONS AND BITTERNs

ARDEIDAE—HERONS, BITTERNs, AND ALLIES

Ardea alba—great egret
Ardea herodias—great blue heron
Egretta thula—snowy egret
Nycticorax nycticorax—black-crowned night-heron

HUMMINGBIRDS

TROCHILIDAE—HUMMINGBIRDS

Calypte anna—Anna’s hummingbird
Selasphorus rufus—rufous hummingbird
Selasphorus sasin—Allen’s hummingbird

JAYS, MAGPIES AND CROWS

CORVIDAE—CROWS AND JAYS

Apelocoma californica—western scrub-jay
Corvus brachyrhynchos—American crow
Corvus corax—common raven

KINGFISHERS

ALCEDINIDAE—KINGFISHERS

Megaceryle alcyon—belted kingfisher

MOCKINGBIRDS AND THRASHERS

MIMIDAE—MOCKINGBIRDS AND THRASHERS

Mimus polyglottos—northern mockingbird
Toxostoma redivivum—California thrasher

NEW WORLD QUAIL

ODONTOPHORIDAE—NEW WORLD QUAILS

Callipepla californica—California quail

APPENDIX C (Continued)

NEW WORLD VULTURES

CATHARTIDAE—CARDINALS AND ALLIES

Cathartes aura—turkey vulture

OLD WORLD SPARROWS

PASSERIDAE—OLD WORLD SPARROWS

* *Passer domesticus*—house sparrow

OLD WORLD WARBLERS AND GNATCATCHERS

SYLVIIDAE—SYLVIID WARBLERS

Polioptila californica californica—coastal California gnatcatcher

OWLS

TYTONIDAE—BARN OWLS

Tyto alba—barn owl

PELICANS

PELECANIDAE—PELICANS

Pelecanus occidentalis—brown pelican

PIGEONS AND DOVES

COLUMBIDAE—PIGEONS AND DOVES

Zenaida macroura—mourning dove

* *Columba livia*—rock pigeon (rock dove)

RAILS, GALLINULES AND COOTS

RALLIDAE—RAILS, GALLINULES, AND COOTS

Fulica americana—American coot

Rallus obsoletus obsoletus—Ridgway's rail

SHOREBIRDS

RECURVIROSTRIDAE—STILTS AND AVOCETS

Recurvirostra americana—American avocet

APPENDIX C (Continued)

SCOLOPACIDAE—SANDPIPERS, PHALAROPES, AND ALLIES

- Actitis macularius*—spotted sandpiper
- Calidris mauri*—western sandpiper
- Calidris minutilla*—least sandpiper
- Limnodromus scolopaceus*—long-billed dowitcher
- Limosa fedoa*—marbled godwit
- Numenius americanus*—long-billed curlew
- Tringa melanoleuca*—greater yellowlegs
- Tringa semipalmata*—willet

SILKY FLYCATCHERS

PTILOGONATIDAE—SILKY-FLYCATCHERS

- Phainopepla nitens*—phainopepla

STARLINGS AND ALLIES

STURNIDAE—STARLINGS

- * *Sturnus vulgaris*—European starling

SWALLOWS

HIRUNDINIDAE—SWALLOWS

- Hirundo rustica*—barn swallow
- Petrochelidon pyrrhonota*—cliff swallow
- Stelgidopteryx serripennis*—northern rough-winged swallow

SWIFTS

APODIDAE—SWIFTS

- Aeronautes saxatalis*—white-throated swift
- Chaetura vauxi*—Vaux's swift

TERNS AND GULLS

LARIDAE—GULLS, TERNS, AND SKIMMERS

- Hydroprogne caspia*—Caspian tern
- Larus californicus*—California gull
- Larus delawarensis*—ring-billed gull
- Larus occidentalis*—western gull
- Sterna forsteri*—Forster's tern

APPENDIX C (Continued)

THRUSHES

TURDIDAE—THRUSHES

- Sialia mexicana*—western bluebird
- Turdus migratorius*—American robin

WATERFOWL

ANATIDAE—DUCKS, GEESE, AND SWANS

- Anas acuta*—northern pintail
- Anas americana*—American wigeon
- Anas clypeata*—northern shoveler
- Anas cyanoptera*—cinnamon teal
- Anas discors*—blue-winged teal
- Anas platyrhynchos*—mallard
- Aythya affinis*—lesser scaup
- Bucephala albeola*—bufflehead
- Melanitta perspicillata*—surf scoter

WAXWINGS

BOMBYCILLIDAE—WAXWINGS

- Bombycilla cedrorum*—cedar waxwing

WOOD WARBLERS AND ALLIES

PARULIDAE—WOOD-WARBLERS

- Cardellina pusilla*—Wilson's warbler
- Geothlypis trichas*—common yellowthroat
- Icteria virens*—yellow-breasted chat
- Oreothlypis celata*—orange-crowned warbler
- Setophaga coronata*—yellow-rumped warbler
- Setophaga nigrescens*—black-throated gray warbler
- Setophaga petechia*—yellow warbler

WOODPECKERS

PICIDAE—WOODPECKERS AND ALLIES

- Colaptes auratus*—northern flicker
- Picoides nuttallii*—Nuttall's woodpecker
- Picoides pubescens*—downy woodpecker

APPENDIX C (Continued)

WRENS

TROGLODYTIDAE—WRENS

- Cistothorus palustris*—marsh wren
- Thryomanes bewickii*—Bewick's wren
- Troglodytes aedon*—house wren

WRENTITS

TIMALIIDAE—BABBLERS

- Chamaea fasciata*—wrentit

INVERTEBRATE

BUTTERFLIES

LYCAENIDAE—BLUES, HAIRSTREAKS, AND COPPERS

- Brephidium exile*—western pygmy-blue
- Callophrys augustinus*—brown elfin
- Callophrys dumetorum*—bramble hairstreak
- Glaucopsyche lygdamus australis*—southern blue
- Hemiargus ceraunus gyas*—Edward's blue
- Leptotes marina*—marine blue
- Plebejus acmon*—Acmon blue
- Strymon melinus*—gray hairstreak

NYMPHALIDAE—BRUSH-FOOTED BUTTERFLIES

- Agraulis vanillae*—Gulf fritillary
- Chlosyne gabbii*—Gabb's checkerspot
- Coenonympha tullia californica*—common californica ringlet
- Danaus plexippus*—monarch
- Junonia coenia*—common buckeye
- Limenitis lorquini*—Lorquin's admiral
- Nymphalis antiopa*—mourning cloak
- Vanessa annabella*—west coast lady
- Vanessa atalanta*—red admiral
- Vanessa cardui*—painted lady
- Vanessa virginiensis*—Virginia lady

RIODINIDAE—METALMARKS

- Apodemia mormo virgulti*—Behr's metalmark

APPENDIX C (Continued)

HESPERIIDAE—SKIPPERS

Atalopedes campestris—sachem
Erynnis funeralis—funereal duskywing
Erynnis tristis—mournful duskywing
Hylephila phyleus—fiery skipper
Lerodea eufala—Eufala skipper
Ochlodes sylvanoides—woodland skipper
Panoquina errans—wandering skipper
Poanes melane—umber skipper
Polites sabuleti—sandhill skipper

PAPILIONIDAE—SWALLOWTAILS

Papilio eurymedon—pale swallowtail
Papilio rutulus—western tiger swallowtail
Papilio zelicaon—anise swallowtail

PIERIDAE—WHITES AND SULFURS

Anthocharis sara sara—Pacific sara orangetip
Colias eurydice—California dogface
Eurema nicippe—sleepy orange
Pieris rapae—cabbage white
Pontia protodice—checkered white

CRAYFISH

CAMBARIDAE—FRESHWATER CRAYFISH

Procambarus clarkii—red swamp crayfish

MAMMALS

CANIDS

CANIDAE—WOLVES AND FOXES

Canis latrans—coyote

DOMESTIC

CANIDAE—WOLVES AND FOXES

* *Canis lupus familiaris*—domestic dog

APPENDIX C (Continued)

FELIDAE—CATS

- * *Felis catus*—domestic cat

HARES AND RABBITS

LEPORIDAE—HARES AND RABBITS

- Sylvilagus audubonii*—desert cottontail
- Sylvilagus bachmani*—brush rabbit

MUSTELIDS

MUSTELIDAE—WEASELS, SKUNKS, AND OTTERS

- Mustela frenata*—long-tailed weasel

OPOSSUMS

DIDELPHIDAE—NEW WORLD OPOSSUMS

- * *Didelphis virginiana*—Virginia opossum

POCKET GOPHERS

GEOMYIDAE—POCKET GOPHERS

- Thomomys bottae*—Botta's pocket gopher

RACCOONS

PROCYONIDAE—RACCOONS AND RELATIVES

- Procyon lotor*—raccoon

RATS AND MICE

MURIDAE—RATS AND MICE

- Neotoma lepida*—desert woodrat
- Reithrodontomys megalotis*—western harvest mouse

SQUIRRELS

SCIURIDAE—SQUIRRELS

- Spermophilus (Otospermophilus) beecheyi*—California ground squirrel

REPTILE

APPENDIX C (Continued)

LIZARDS

PHRYNOSOMATIDAE—IGUANID LIZARDS

Sceloporus occidentalis—western fence lizard

Uta stansburiana—common side-blotched lizard

ANGUIDAE—ALLIGATOR LIZARDS

Elgaria multicarinata—southern alligator lizard

SNAKES

COLUBRIDAE—COLUBIRD SNAKES

Pituophis catenifer—gophersnake

Lampropeltis californiae—California kingsnake

* signifies introduced (non-native) species

APPENDIX D
Species Sensitivity Categories

APPENDIX D

Species Sensitivity Categories

Federal

- **Endangered.** Taxa threatened throughout all or a significant portion of their range.
- **Threatened.** Taxa likely to become endangered in the foreseeable future.
- **Candidate.** Taxa for which the USFWS currently has on file substantial information on biological vulnerability and threat(s) to support the appropriateness of proposing to list them as endangered or threatened species.
- **Federal Species of Concern.** Taxa that were formerly Category 2 Candidates for listing as threatened or endangered. This category is an “unofficial” designation for species that may warrant listing, but for which substantial information to support the listing is lacking.

State of California

- **Endangered.** Taxa which are in serious danger of becoming extinct throughout all, or a significant portion, of their range due to one or more causes including loss of habitat, change in habitat, over exploitation, predation, competition, or disease (Section 2062 of the Fish and Game Code).
- **Threatened.** Taxa which, although not presently threatened with extinction, are likely to become endangered species in the foreseeable future (Section 2067 of the Fish and Game Code).
- **Rare.** Taxa which, although not presently threatened with extinction, are present in such small numbers throughout their range that they may become endangered if the present environment worsens (Section 1901 of the Fish and Game Code).
- **Candidate.** Taxa which the Fish and Game Commission has formally noticed as being under review by the Department in addition to the list of threatened and endangered species.
- **Species of Special Concern.** Taxa that appear to be vulnerable to extinction because of declining populations, limited ranges, and/or continuing threats.
- **Watch List.** “Taxa to Watch” that were created in the California Bird Species of Special Concern (2008). The birds on this Watch List are 1) not on the current Special Concern list but were on previous lists and they have not been state listed under CESA; 2) were previously state or federally listed and now are on neither list; or 3) are on the list of “Fully Protected” species.

APPENDIX D (Continued)

California Native Plant Society

The CDFW and CNPS, a private organization dedicated to protection of California native plants, in collaboration with the Rare Plant Status Review groups, which comprise over 300 botanical experts from government, academia, non-government organizations, and the private sector, produced a ranked inventory of rare, threatened, and endangered vascular plant species within California (“the Rare Plant Rank” [RPR]). The rare plant inventory includes rank assignments, geographic distribution, and qualitative characterization of plant species not protected under federal or state endangered species legislation.

The CNPS’s 8th Edition of the CNPS’s *Inventory of Rare and Endangered Plants* (2014) separates plants of interest into five categories of rarity as presented in the table below. The list serves as the candidate list for listing as threatened and endangered by CDFW.

Summary of CNPS RPR Definitions

California RPR	Comments
1A	Plant species presumed extirpated in California because they have not been seen or collected in the wild or plants, which are presumed extinct.
1B	Plant species that are generally rare throughout their range that are also judged to be vulnerable to other threats such as declining habitat.
2A	Plant species that are presumed extirpated in California, but more common in other states
2B	Plant species rare, threatened, or endangered in California but more common in other states
3	Plant species for which additional information is needed before rarity can be determined – A Review List
4	Species of limited distribution or infrequent throughout a broader area in California; and while CDFG/CNPS cannot call these plant species “rare” from a statewide perspective, they are uncommon enough that their status should be monitored regularly – A Watch List

EXHIBIT A
Vegetation Communities Map

-  Big Canyon Nature Park
-  Vegetation Mapping Survey Area
-  Vegetation Communities
- ALHE, Alkali Heath Marsh
- BBCS, California Brittle Bush-California Sagebrush Association
- BBS, California Brittle Bush Alliance
- CBCS, Coyote Brush-California Sagebrush Association
- CBM, California Bulrush Marsh Alliance
- CCM, California Cordgrass Marsh Alliance
- DIST, Disturbed or Barren Mapping Unit
- FOSA, Fourwing Saltbush Alliance
- FWM, Cattail Marshes Alliance
- INMU, Intertidal Mudflat Mapping Unit
- LBS, Lemonade Berry Alliance
- NNG, Upland Mustards Semi-natural Stands
- ORN, Ornamental Landscaping Mapping Unit
- OTDE, Other Developed Areas Mapping Unit
- OW, Open Water Mapping Unit
- PIWE, Pickleweed Mats Alliance
- PTMG, Pepper Tree or Myoporom Groves Semi-natural Stands
- QUBR, Quailbush Alliance
- SAPA, Salt Panne Mapping Unit
- SBS, California Sagebrush Alliance
- SGMJ, Salt Grass-Marsh Jaumea Association
- TRANS, Transportation Mapping Unit
- URBAN, Urban and Commercial Mapping Unit
- dAWRF, Arroyo Willow Disturbed Mapping Unit
- dBBS, California Brittle Bush Disturbed Mapping Unit
- dFOSA, Fourwing Saltbush Disturbed Mapping Unit
- dSBFS, California Sagebrush-Fourwing Saltbush Disturbed Mapping Unit
- dSBS, California Sagebrush Disturbed Mapping Unit



SOURCE: City of Newport Beach, 2015.

