

**Habitat Conservation and Conceptual
Mitigation Plan for the
Newport Banning Ranch Property
City of Newport Beach and Unincorporated Orange County,
California**

Prepared for:

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
EXECUTIVE SUMMARY	VII
1.0 DESCRIPTION OF PROJECT.....	1
1.1 Introduction.....	1
1.2 Three Options for Newport Banning Ranch Property	2
1.2.1 Option 1: Site Clean-up, Restoration/ Conservation, Land Dedication by Property Owner with Public Oversight and Control, and Clustered Infill Development	2
1.2.2 Option 2: Public Acquisition, Clean-up, Restoration, and Maintenance ..	11
1.2.3 Option 3: Continuing Oil Operations (No Change)	11
1.3 Removal of Oil Facilities	11
1.4 Applicant/Permittee	13
1.5 Responsible Parties	13
2.0 MITIGATION PROJECT INFORMATION	15
2.1 Mitigation Site Location	15
2.1.1 Third-Party Mitigation Site.....	15
2.1.2 Potential Centerpiece of the Orange Coast River Park.....	16
2.2 NBR Project Impacts	16
2.2.1 Riparian/Wetland Features.....	17
2.2.2 Seasonal Features and Vernal Pool Watershed San Diego Fairy Shrimp Habitat	19
2.2.3 Raptor Foraging and Grassland Habitat.....	21
2.2.4 California Gnatcatcher Upland Coastal Scrub Habitat	22
2.3 Public Benefits	23
2.3.1 Integrated Public Access/Recreation and Resource Conservation	23
2.3.2 On-Site and Off-Site Water Quality Improvements	27
2.3.3 Aesthetic Improvements	30
2.4 Long-term Ownership Monitoring and Management	30
2.4.1 Ownership and Stewardship of Open Space	30
3.0 MITIGATION IMPLEMENTATION PLAN FOR RIPARIAN AND WETLAND AREAS	31
3.1 Goals of the Proposed Mitigation	31
3.1.1 Target Acreages for Mitigation.....	32
3.1.2 Vegetation Communities to be Established and Restored Mitigation	33
3.1.3 Vegetation Communities to be Enhanced.....	33

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

TABLE OF CONTENTS (CONTINUED)

<u>Section</u>	<u>Page No.</u>
3.2 Functions and Services of Riparian and Wetland Areas to be Impacted	33
3.2.1 Drainages A, B, C, and D	33
3.2.2 Lowland Areas	51
3.2.3 CRAM Analysis of Functions and Services	51
3.3 Site Selection	53
3.3.1 Methods.....	53
3.3.2 Establishment and Enhancement Suitability Factors.....	54
3.4 Functions and Services of Mitigation Sites and Rationale for Expecting Success	55
3.5 Proposed Site Preparation	60
3.5.1 Site Access	61
3.5.2 Existing Resource Impact Avoidance	61
3.5.3 Grading and Construction Documents.....	61
3.5.4 Initial Non-Native Invasive Plant Removal.....	62
3.5.5 Salvage and/or Collection of Native Species On Site.....	63
3.5.6 Erosion Control and Best Management Practices.....	63
3.6 Plant Installation for Riparian and Wetland Areas	64
3.6.1 Recommended Plant Palettes for Establishment, Enhancement, and Restoration of Temporary Impact Areas.....	64
3.6.2 Live Cutting, Container Plant, and Hydroseed Installation	66
3.6.3 Irrigation System Installation/Operation.....	68
3.7 Final Performance Standards for Riparian and Wetland Areas	69
3.7.1 CRAM Performance Standards.....	70
4.0 MITIGATION IMPLEMENTATION PLAN FOR SEASONAL FEATURES AND VERNAL POOLS	71
4.1 Goals of the Proposed Mitigation	71
4.1.1 Target Acreages for Mitigation.....	72
4.2 Functions and Services of Seasonal Features and Vernal Pools to Be Impacted .	72
4.2.1 CRAM Analysis of Functions and Services	73
4.3 Site Selection and Proposed Mitigation Sites	73
4.4 Functions and Services of Mitigation Sites and Rationale for Expecting Success	74
4.5 Site Preparation	75
4.5.1 Site Access and Project Limits	76
4.5.2 Existing Resource Impact Avoidance	76
4.5.3 Weed Removal.....	77

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

TABLE OF CONTENTS (CONTINUED)

<u>Section</u>	<u>Page No.</u>
4.5.4 Topsoil and Inoculum Salvage.....	77
4.5.5 Grading and Construction Documents.....	78
4.5.6 Erosion Control and Best Management Practices.....	79
4.6 Plant Installation for Vernal Pool Areas	79
4.6.1 Recommended Plant Palette for Vernal Pool Mitigation Areas	79
4.6.2 Hydroseed Installation	80
4.6.3 Irrigation System Installation.....	80
4.7 Final Performance Standards for Vernal Pool Areas.....	81
4.7.1 Quantitative Vernal Pool Hydrology Success Criteria	81
4.7.2 San Diego Fairy Shrimp Success Criteria.....	82
4.7.3 Quantitative Vegetation Performance Standards	82
4.7.4 CRAM Performance Standards.....	83
5.0 MITIGATION IMPLEMENTATION PLAN FOR GRASSLAND AND SCRUB AREAS	85
5.1 Goals of the Proposed Mitigation	85
5.1.1 Target Acreages for Grassland Mitigation.....	86
5.1.2 Target Acreages for Scrub Mitigation	87
5.2 Site Selection and Type(s) of Habitat to be Established/Restored for Mitigation	88
5.2.1 Grassland Mitigation.....	88
5.2.2 Scrub Mitigation	89
5.3 Proposed Site Preparation	89
5.3.1 Initial Non-Native Invasive Plant Removal and Soil Preparation	89
5.4 Plant Installation	90
5.4.1 Recommended Plant Palettes for Grassland Areas	90
5.4.2 Recommended Plant Palettes for Scrub Areas.....	92
5.4.3 Container Plant Installation.....	94
5.4.4 Hydroseed	94
5.4.5 Irrigation System Installation.....	95
5.5 Final Performance Standards	96
6.0 MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD.....	99
6.1 Maintenance Activities	99
6.2 Weed Control	99
6.3 Trash Removal	100
6.4 Irrigation Maintenance.....	100

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

TABLE OF CONTENTS (CONTINUED)

<u>Section</u>	<u>Page No.</u>
7.0 MONITORING PERIOD	101
7.1 Construction and Installation Monitoring.....	101
7.2 120-Day Plant Establishment Period	101
7.3 Monitoring Methods	101
7.4 Qualitative Monitoring.....	102
7.5 Quantitative Monitoring.....	103
7.6 Wildlife Monitoring.....	103
7.7 Adaptive Management.....	104
7.7.1 Flooding.....	104
7.7.2 Drought	105
8.0 REPORTING	107
8.1 Annual Monitoring Reports	107
8.2 Agency Notification at End of Monitoring Period	107
8.3 Regulatory Agency Conformation.....	107
9.0 CONTINGENCY MEASURES.....	109
10.0 REFERENCES.....	111

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

TABLE OF CONTENTS (CONTINUED)

Page No.

FIGURES

1	Project Location	3
2	Project Vicinity	5
3a	Existing Conditions.....	7
3b	Proposed Project	9
4a	USACE Project Impacts	35
4b	CDFW Project Impacts	37
4c	CCC Project Impacts.....	39
4d	RWQCB Project Impacts.....	41
5	Conceptual Mitigation Plan	43
6a	Lowlands - Conceptual Mitigation Plan	45
6b	Mesa (North) - Conceptual Mitigation Plan	47
6c	Mesa (South) - Conceptual Mitigation Plan	49
7	Special Status Species and Plants	57

TABLES

1	Impacts to Riparian, Wetlands, and Waters of the U.S. by Jurisdiction and Impact Type and Proposed Mitigation Acreage	17
2	Impacts to Vernal Pools and Seasonal Features by Feature Name	19
3	Impacts to Grasslands by Impact Type and Proposed Mitigation Acreage	21
4	Scrub Impacts and Proposed Mitigation Acreage.....	23
5	Summary of Proposed Mitigation by Impact and Habitat Types for Temporary and Permanent Impacts to Riparian and Wetland Habitats.....	32
6	CRAM Attributes and Metrics.....	52
7	Riparian Southern Willow Scrub Plant Palette for Establishment, Enhancement and Restoration Areas	64
8	Riparian Mulefat Scrub Plant Palette for Restoration Areas	65
9	Wetland Salt Marsh Container Plant Palette for Establishment and Restoration Areas.....	66
10	Wetland Alkali Meadow Container Plant Palette for Restoration Areas.....	66
11	Performance Standards for Mulefat and Southern Willow Scrub Riparian Habitats	70
12	Performance Standards for Salt Marsh Wetlands and Alkali Meadows	70

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

TABLE OF CONTENTS (CONTINUED)

	<u>Page No.</u>
13 Summary of Proposed Mitigation by Impact and Mitigation Types for Temporary and Permanent Impacts to Seasonal Wetlands and Vernal Pools	72
14 Vernal Pool Mitigation Areas Plant Palette	79
15 Performance Standards for Established, Enhanced (VP1), and Restored Pools (VP2, MM)*	83
16 Summary of Proposed Mitigation by Impact and Mitigation Types for Temporary and Permanent Impacts to Grassland Habitats	86
17 Summary of Proposed Mitigation by Impact and Mitigation Types for	88
Temporary and Permanent Impacts to Scrub Habitats	88
18 Purple Needlegrass Grassland Plant Palette	90
19 Salt-Tolerant Transitional Grassland Plant Palette	91
20 Annual Grassland Plant Palette	91
21 CSS Plant Palette for Establishment, Enhancement and Restoration Areas	92
22 MSS Plant Palette for Establishment, Enhancement and Restoration Areas	92
23 CSS Revegetation	93
24 Performance Standards for PNGG Mitigation Areas	96
25 Performance Standards for Salt-Tolerant Transitional Grasslands and Annual Grasslands	96
26 Performance Criteria for CSS and MSS Mitigation Areas	97
27 Performance Criteria for CSS Revegetation Areas	97
28 Mitigation Area Monitoring Site Visit Schedule	102
29 CSS Revegetation Area Monitoring Site Visit Schedule	102

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

EXECUTIVE SUMMARY

This Habitat Conservation and Conceptual Mitigation Plan (HCCMP) for the mitigation (Mitigation Project) associated with the Newport Banning Ranch Project (Project) addresses on-site wetland/riparian establishment, restoration and enhancement, vernal pool establishment and enhancement, as well as upland scrub and grassland restoration, for impacts to jurisdictional waters, riparian habitat, vernal pool and seasonal features, and scrub and grassland habitat resulting from oil field clean up and implementation of the Project. The HCCMP also addresses habitat enhancement for a number of special-status species, including least bell's vireo, Belding's savannah sparrow, San Diego fairy shrimp, and California gnatcatcher. Mitigation management and monitoring activities within the Project area are subject to mitigation requirements adopted as part of the local planning and environmental review and approval process through the City, as the lead agency for the proposed Project. In addition, the proposed Project will require subsequent federal and state permitting from permitting agencies, including the California Coastal Commission (CCC), for a Coastal Development Permit; California Department of Fish and Wildlife (CDFW), for a streambed alteration agreement required by Fish and Game Code section 1600, et seq.; the U.S. Army Corps of Engineers (ACOE), for a section 404 permit; the Regional Water Quality Control Board (RWQCB), for a section 401 water quality certification permit; and the U.S. Fish and Wildlife Services (USFWS), for a Section 7 Consultation pursuant to the Federal Endangered Species Act and issuance of a Biological Opinion. This HCCMP, prepared in accordance with the requirements listed in 33 CFR Part 332, will be used to address the mitigation requirements of these local, state, and federal agencies.

Implementation of this HCCMP is dependent upon the approval and receipt of all required permits and agreements from the local, state and federal agencies listed above.

This HCCMP presents a comprehensive program of on-site compensatory mitigation that is designed to fully mitigate all biological impacts of the proposed Project, and to enhance on-site biological communities in a way that improves the overall ecological function of the site. Vegetation communities to be mitigated include coastal sage scrub, coastal bluff scrub, non-native grasslands, native bunchgrass grasslands, riparian wetlands, and seasonal features/vernal pools. These mitigation treatment areas are embedded within a larger open space conservation area that will be permanently protected and managed as a single preserve area once the interim management period for the mitigation sites concludes and final resource agency sign-off is granted. In addition, this plan identifies additional mitigation opportunities for tidal marsh and/or alkali meadow that may be implemented in the future by third parties.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

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1.0 DESCRIPTION OF PROJECT

1.1 Introduction

The Newport Banning Ranch site consists of approximately 400 acres and is located in unincorporated Orange County and the City of Newport Beach (Figures 1 and 2). The proposed Newport Banning Ranch project (Project) is a mixed-use development composed of a 257-acre Natural Open Space Preserve, 33 acres of Parklands, 83 acres of clustered infill development (mixed-use residential, neighborhood commercial and overnight accommodations), 11 acres of public roadways, and 16 acres of remainder oil facilities that will be deed restricted for future open space use (Figure 3b). Plans for the Project have evolved over the last 20 years with the assistance of local public agencies and experts, and the involvement of a broad cross-section of the general public.

Of the 257-acre Natural Open Space Preserve, approximately 10 acres would be dedicated for public interpretive trails, approximately 3 acres for the construction of water quality and detention basins, and approximately 3 acres would provide a native planting buffer around the oil remainder sites.

The oil facilities noted above would be separated from the Project and will continue oil production operations within 2 sites. These 2 sites would be connected by an access road between them. Upon the future cessation of oil operations, the oil remainder sites would be abandoned and remediated with the areas designated for open space use. It is anticipated that oil production would continue on the Project site for an additional 30 to 50 years from now.

The proposed Project includes construction of a circulation system for vehicles, bicycles, and pedestrians. New vehicular roadways are proposed to connect to existing off-site roadways and to provide access through the Project site. Within the areas of the Project site that are not a part of the Natural Open Space Preserve, roadways are proposed to provide new coastal access, access to open space, access to and circulation within residential areas, commercial areas, visitor-serving areas, and parks. Significant on-site public parking is proposed. The Project proposes pedestrian and bicycle trails that would connect proposed on-site residential neighborhoods, the resort inn, commercial uses, and open space and would also be connected to existing off-site City and regional trail systems. A pedestrian and bicycle bridge is proposed to connect the Project site to the southern (ocean) side of West Coast Highway.

The proposed Project includes the construction of new infrastructure and utilities including water, sewer, storm drain, and water quality management facilities to serve the proposed Project, in addition to existing runoff from adjacent development areas. New water, sewer, and storm drain facilities would connect to existing infrastructure located adjacent to the Project site.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

1.2 Three Options for Newport Banning Ranch Property

Prior to the 1940s, the Project site was used for agriculture and, during the 1940s, portions of the site closer to West Coast Highway were used as a World War II military coast watch station, for equipment storage and maintenance, and for miscellaneous peripheral operations (including areas leased to welders, pipe storage, and equipment operators). Since the early 1940s, oil operations, including exploration, development, production, and maintenance, have been conducted on the Project site, currently identified as part of the Banning Lease, the Banning Ranch Oil Field, or West Newport Oil Field. The Project site has been extensively disturbed by the oil field facilities and operations, which include oil wells, tanks, pipelines, utilities, graded roads and equipment areas, some of which are surfaced with gravel, asphalt and asphalt-like material (degraded crude oil, or crude oil tank sediments blended with sand and/or dirt). Surface facilities also include various storage facilities, staging and stockpile areas, personnel support facilities, past drilling and production pits, and areas subject to vegetation management (Figure 3a).

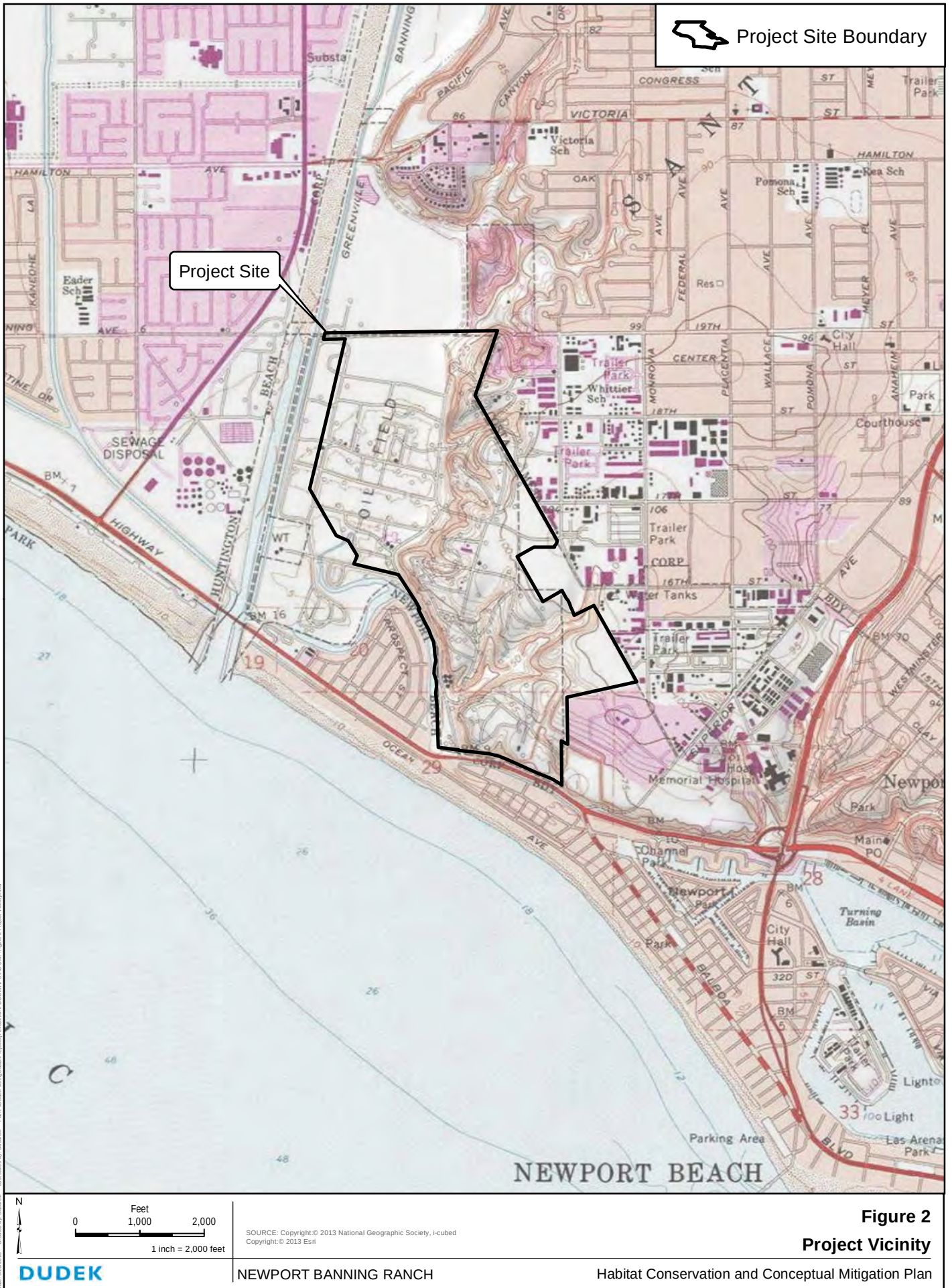
Although the Project site has been disturbed by historic and ongoing oil operations and is dominated by non-native vegetation, it contains a diverse population of flora and fauna species. Additionally, the site is uniquely situated both within an urban coastal community and adjacent to one of the region's most significant open space and recreational corridors along the Santa Ana River. These factors collectively provide opportunities to integrate the site's distinct physical attributes and location with a balanced redevelopment plan that opens up the property and emphasizes Smart Growth infill development with restoration and expansion the site's natural resource values, connections to other public open space lands, and, introducing high-priority coastal public access, recreational and visitor-serving land uses on the property. There are three options for the future of the Project site as described below.

1.2.1 Option 1: Site Clean-up, Restoration/ Conservation, Land Dedication by Property Owner with Public Oversight and Control, and Clustered Infill Development

Option 1, the proposed Project, would preserve 257 acres of the site as a Natural Open Space Preserve. This would be the foundation for a comprehensive plan to provide 33 acres of public parklands, 83 acres of clustered infill development and 11 acres of public roadways, and to confine oil operations to an existing 16 acres in the lowland that would ultimately become natural open space after future cessation of oil activities and clean-up. The Project would secure the long-term monitoring and maintenance of the Natural Open Space Preserve, and provide public access and interpretive improvements to significantly broaden the public benefits of habitat conservation and restoration. Option 1 is preferred by the Landowner, was unanimously approved by the City of Newport Beach, and is the foundation of the HCCMP outlined herein.

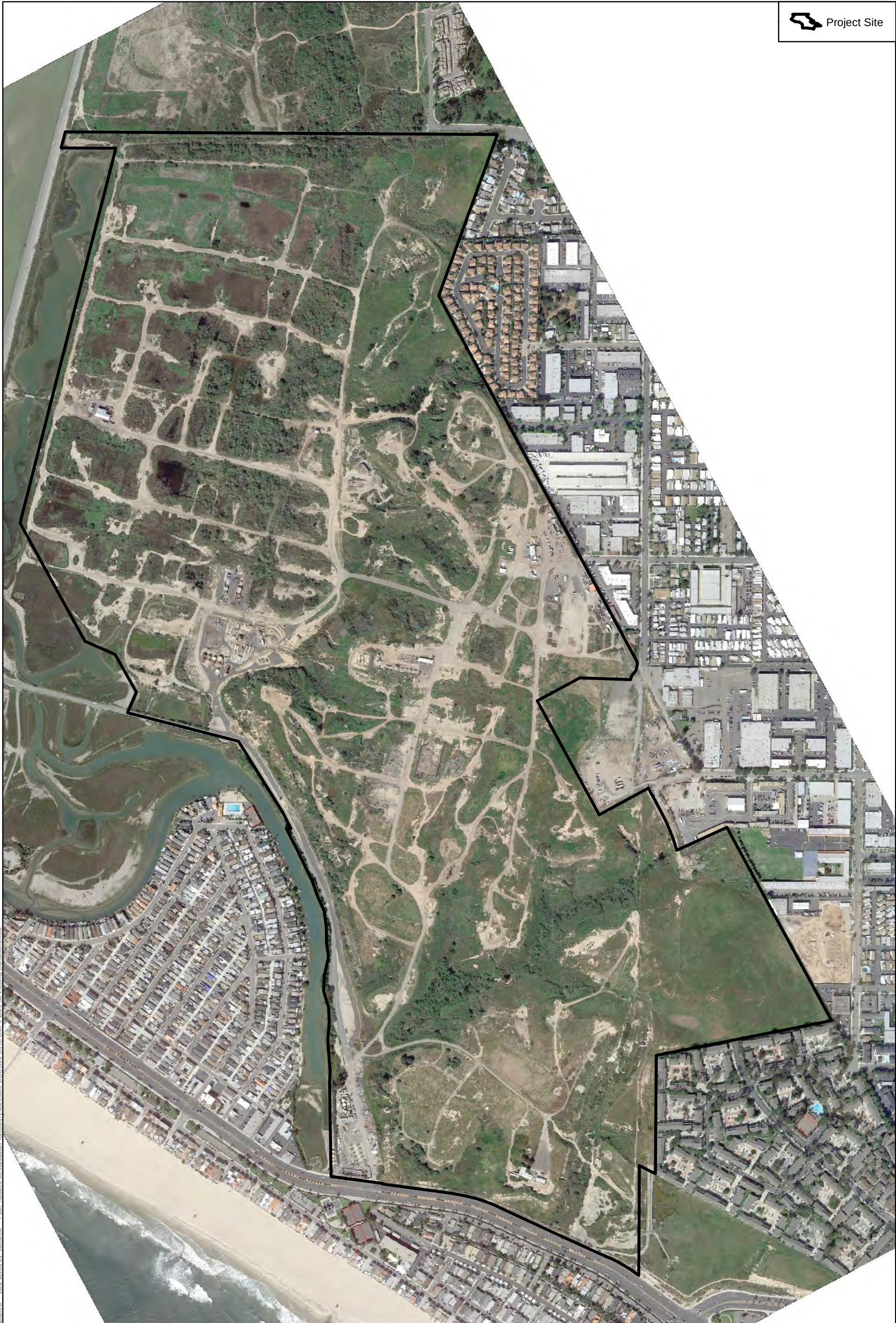
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1 inch = 554 feet

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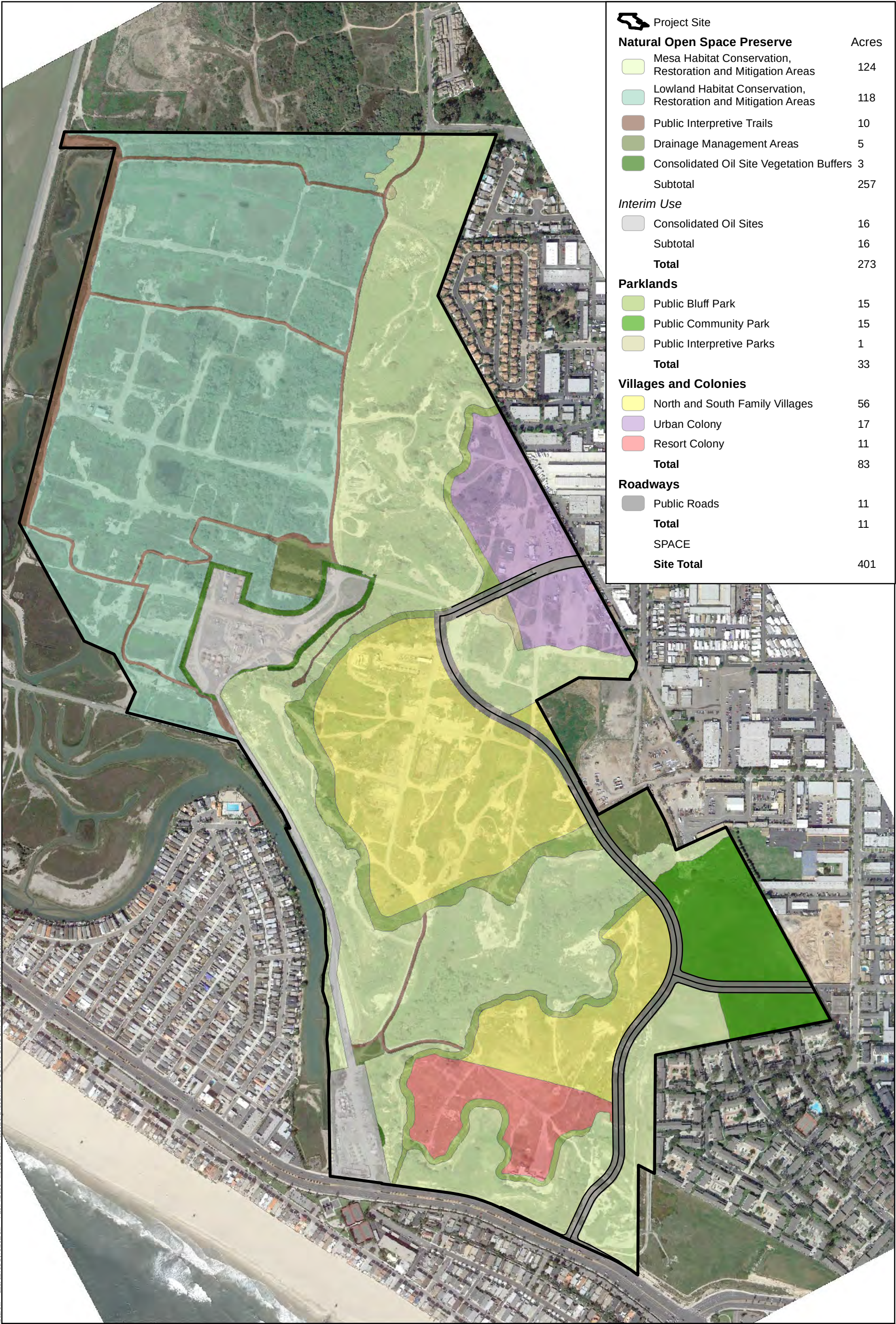
NEWPORT BANNING RANCH

Habitat Conservation and Conceptual Mitigation Plan

Figure 3a
Existing Conditions

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

1.2.2 Option 2: Public Acquisition, Clean-up, Restoration, and Maintenance

Option provides for acquisition of the Project site through public funding to provide “open space, including significant active community parklands that serve adjoining residential neighborhoods” as identified in the City of Newport Beach General Plan. The 401 acres have an estimated value of \$185 to \$211 million for the surface rights (Source: 2009 City of Newport Beach Comparative Pricing Study). With an estimated cost of \$30 to 60 million to properly abandon and remediate the oil field, and no near term incentive to do so, conservation and restoration would be small and spotty at best for many decades given the existing oil roads, sumps, wells and other facilities. Native habitat degradation and expansion of invasive species would continue. Equally important, there are no available public funds for habitat protection and restoration, interpretation or public access, or on-going maintenance and operations of the open space. This option is difficult to envision as a viable solution in Southern California within the foreseeable future and perhaps the remainder of the 21st Century.

1.2.3 Option 3: Continuing Oil Operations (No Change)

If the property is not acquired by a public agency or partially developed by the landowner, oil operations will continue on the property for the duration of the oilfields economic life. The Project site has been extensively impacted by over 70 years of oil production, dating back to World War II, and has been fenced for public safety and liability reasons. It is anticipated that without some sort of land use change or incentive to the oil operators and landowners, the existing oil operations in the lowlands and uplands will continue to be profitable and thus will continue for many more decades. When or how habitat restoration could be conducted on the site is not clear. This option will ultimately lead to Options 1 or 2, but most likely not until at least the second half of the 21st Century.

1.3 Removal of Oil Facilities

With the exception of the 16-acre Remainder Oil Sites, abandonment and remediation of oil facilities would occur throughout the balance of the 401-acre site prior to the development initiation, as detailed in the draft Remedial Action Plan (Geosyntec 2009). Outside the remainder areas, abandonment and remediation of oil facilities and operations would proceed as part of the overall proposed Project and are necessary to implement the associated mitigation required for impacts incurred through the property. Oil operations are currently spread across both the upper mesa and lowland areas of the site. These oil field operations areas will be the primary focus of the remediation program and can be generally described as follows:

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

- Oil Wells and Pads – The surface locations of the existing or abandoned oil wells. A typical oil well pad generally includes an area of 20 to 30 feet around each oil well that contains pipelines, concrete pads, pumping and power equipment, and the work area for large workover rigs, trucks, and tanks.
- Oil Pipeline Corridors – Areas where one or more pipelines exist, or existed, to convey oil, water, and gas from each well to larger group lines, and then on to each processing facility. Most lines are above ground with some sitting on pipeline support structures that are cemented into the ground to raise the actual pipeline above the ground surface. Some older lines may still exist below the surface.
- Utility Poles – Power poles to support the electrical system throughout the field. These treated wood poles support transformers, power lines, electrical panels, and other equipment to serve the oil operations. Poles were often left in place (even at abandoned well locations) to support potential future drilling.
- Oilfield Operations Areas – All areas historically used in the oil- and gas-producing operations. This includes roads, wells, and surrounding well pads, tanks and facilities, pipeline and utility corridors and general staging and work areas. These areas have generally been graded and may be surfaced with gravel, asphalt, crude oil, crude oil tank sediments, or other materials. There are numerous facility areas throughout the Project site. These vary from large facility areas that include extensive piping, oil separation and processing tanks, power facilities, mechanics and workshops, and other equipment, to smaller

One of the significant benefits of the proposed Project is that it would incentivize timely reduction of active oil production operations (which currently effectively utilize the entire 401-acre site) into two interconnected remainder oil areas totaling approximately 16 acres. This consolidation would free up the remainder of the site for restoration, development, and public use.

A portion of the original oilfield has already undergone abandonment and remediation. A parcel of the original lowland oilfield property (92 acres along the westerly edge adjacent to the Santa Ana River) was purchased by the U.S. Army Corps of Engineers (USACE) in the late 1980s as part of the USACE Santa Ana River Flood Control Project. The parcel was converted to a tidally influenced coastal wetland habitat in the early 1990s as a wetland offset or mitigation measure for work completed elsewhere along their project corridor. This conversion involved similar abandonment and remediation activities that are associated with the proposed Project.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

1.4 Applicant/Permittee

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1.5 Responsible Parties

This HCCMP is submitted on behalf of the applicant, Newport Banning Ranch LLC (NBR). The representative for NBR is Michael A. Mohler, Project Manager. Upon receipt of requisite permits and approvals, the NBR Project will be financially responsible for all costs associated with the implementation, monitoring, maintenance, and protection of the restoration areas defined in this document and as required by the City of Newport Beach (City), the California Coastal Commission (CCC), the U.S. Army Corps of Engineers (ACOE), the Regional Water Quality Control Board (RWQCB), the California Department of Fish and Wildlife (CDFW), and the U.S. Fish and Wildlife Service (USFWS), collectively referred to herein as the Permitting Agencies. NBR is responsible for the completion of mitigation requirements. NBR will provide access to the mitigation areas for project biologists, project contractors, City representatives, and Permitting Agency officials.

NBR will select a qualified Project Biologist to design and monitor installation and interim maintenance of the mitigation areas. The Project Biologist will review all aspects of pertinent contract documents, including, but not limited to, site protection, contractor submittals, and scheduling of formal site observations. The Project Biologist will observe and coordinate implementation of this HCCMP, including preparation of final construction drawings; interpretation of said plans; and conduct field monitoring of project installation and monitoring during the 120-day initial maintenance period and biological monitoring throughout a 5-year monitoring period. The Project Biologist will possess specific knowledge and project-level experience with riparian and wetlands restoration and enhancement projects in Southern California. During construction, the Project Biologist will have stop work authority that is limited to situations where sensitive biological are in eminent threat of impacts from construction equipment.

The Project Biologist will inform all construction personnel prior to implementation of this HCCMP and of all on-site construction restrictions. The Project Biologist will inform all

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

personnel of the presence or potential presence of sensitive species and vegetation communities adjacent to the project area, as well as known on-site biological dangers (e.g., rattlesnakes, beehives, poison oak). Information about federal, state, and local laws relating to protected biological resources will be discussed as part of contractor personnel education. Access and staging areas outside of environmentally sensitive areas will be established. Project installation monitoring will occur throughout the mitigation and on-site construction periods. Monitoring time may increase or decrease as required by field conditions and construction activities necessary to meet performance criteria.

NBR will hire project installation contractors and maintenance contractors (Restoration Contractors). NBR may choose to hire a maintenance contractor that is separate from the installation contractor. The Restoration Contractor will be a qualified, licensed company holding a State of California C-27 license and have at least 5-years' experience in wetland, riparian, vernal pool, grassland and coastal sage scrub restoration, establishment, and maintenance. During the implementation phase, the Restoration Contractor will be responsible for performing project installation, including site preparation, soil amending, irrigation, seeding, planting, grading, erosion control, and other tasks as directed by the construction drawing and specifications, consistent with this document, and in compliance with permits issued by the Permitting Agencies. During the long-term monitoring phase, the Restoration Contractor will be responsible for maintenance of the mitigation areas including plantings, irrigation system, weed control, erosion control, trash removal, replanting, and other tasks as described in this document. Adaptive measures may be recommended by the Project Biologist in addition to other previously stated requirements.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

2.0 MITIGATION PROJECT INFORMATION

The proposed Project will result in impacts to wetlands, riparian habitat, raptor foraging grassland habitat, areas of upland scrub, some of which are occupied by California gnatcatcher, and alkali meadow. The proposed Mitigation Project is comprised of on-site establishment, enhancement, and restoration in conjunction with preservation/dedication of substantial areas of open space. Mitigation is proposed to occur entirely on site.

Vegetation communities to be mitigated include coastal sage scrub, coastal bluff scrub, non-native grasslands, native bunchgrass grasslands, riparian wetlands, and seasonal features/vernal pools. These mitigation treatment areas are embedded within a larger open space conservation area that will be dedicated and managed as a single preserve area once the interim management period for the mitigation sites concludes and final resource agency sign-off is granted. In addition, this plan identifies additional mitigation opportunities for tidal marsh and alkali meadow that may be implemented in the future by third parties.

2.1 Mitigation Site Location

The proposed Project occurs on property that spans approximately 401 acres in unincorporated Orange County and the City of Newport Beach. The Mitigation Project is proposed to occur entirely on site, located north of Pacific Coast Highway, east of the Santa Ana River, south of 19th Street and Talbert Regional Park, and west of existing residential and commercial areas, situated within unsectioned areas of Township 6 South, and Range 10 West (5-6). The site has been degraded by oil extraction operations for decades. The property is divided into two distinct areas, an upper mesa area bisected by drainages and a “lowland” area covering approximately 110 acres at the northwest corner of the site. Land uses adjacent to the Project include Talbert Preserve and Regional Park to the north, residential neighborhoods to the northeast, residential neighborhoods and light industry to the east, the Newport Crest residential neighborhood to the southeast, Pacific Coast Highway to the south, Newport Shores residential neighborhood to the southwest, and a tidal channel that includes a ACOE salt marsh restoration site that separates the Project from the Santa Ana River Channel to the west.

2.1.1 Third-Party Mitigation Site

Within the lowlands, approximately 29.9 acres of the Natural Open Space Preserve are proposed for designation as a third-party mitigation area to allow opportunities for additional habitat establishment, restoration and/or enhancement by parties other than the Applicant requiring environmental mitigation, offsets, or other habitat sites within the region. The third-party mitigation area is primarily a salt marsh and alkali meadow wetland area located within the

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

lowland area, contiguous with the USACE-restored salt marsh basin along the Santa Ana River which has also served as a third-party mitigation site.

The Applicant will complete clean up (i.e., oil facility removal and oilfield remediation activities) within the third-party mitigation area to enable future enhancement and establishment by others in the disturbed salt marsh and/or alkali meadow habitats that are currently present. These clean-up activities will result in temporary impacts to habitats (many disturbed) that will be subsequently mitigated pursuant to the proposed Mitigation Project. The result will be an overall enhancement of the area. The third-party mitigation opportunities will then only be available for those disturbed areas remaining after completion of clean up and mitigation for temporary impacts..

As a part of any third-party mitigation, removal of existing exotic species shall be required. Approximately 10.26 acres of exotic species within the third-party mitigation areas shall be removed as a condition of any third-party mitigation implementation.

2.1.2 Potential Centerpiece of the Orange Coast River Park

The Mitigation Project will position the Natural Open Space Preserve to become the future centerpiece of the long-envisioned 1,000-acre Orange Coast River Park. This regionally significant park concept has been long planned to extend inland from the mouth of the Santa Ana River to include properties in Costa Mesa and Newport Beach, and to spread northerly up the coast to wetland areas in Huntington Beach. Following the final consolidation and removal of oil facilities and additional oil remediation activities, the lowland areas and the upland areas at the northern end of the Project site will become available for this Mitigation Project and will be permanently protected as a Natural Open Space Preserve, providing for habitat and recreational continuity with other parklands envisioned in the Orange Coast River Park concept.

2.2 NBR Project Impacts

Oil field abandonment and remediation, certain restoration activities, and project development would result in impacts to various habitats on site. Impacts associated with oil field abandonment, remediation, and certain restoration activities (such as the eastern vernal pool restoration complex) are identified as “Abandonment/Remediation – Open Space/Restoration” impacts, and are considered temporary since the impacts will be followed by restoration activities and the areas then preserved. In an effort to minimize impacts to sensitive habitats, the Project focuses the proposed development in areas that are currently developed and disturbed by existing oil facilities; as such, there are many instances in which project development would be preceded by oil field abandonment and remediation, resulting in “overlapping” impacts. These impacts are identified as “Abandonment/Remediation and Development Plan” impacts, and are considered permanent impacts since the impacted area will be subject to a permanent grading, structure or facility

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

footprint associated with development of mixed-use residential, neighborhood commercial and overnight accommodations, as well as parklands, circulation amenities and water quality features. “Development Plan” impacts are similarly considered permanent impacts and are identified in all areas subject to a permanent grading, structure or facility footprint as described previously and where not preceded by oil field abandonment and remediation activities.

Riparian, wetland and seasonal feature jurisdictional impacts are also distinguished for all areas subject to CCC, CDFW, ACOE and/or RWQCB jurisdiction. Standard survey methods were applied to delineate jurisdictional areas and to analyze potential impacts for each Permitting Agency. However, for purposes of identifying riparian, wetland and seasonal features subject to CCC jurisdiction, all features within the oil production, operation, maintenance, abandonment and remediation activity areas were reviewed for relative location within existing oil field facility areas and pending/planned abandonment, consolidation and remediation sites to identify those features considered exempt and not jurisdictional under the CCA pursuant to the 1973 Resolution of Exemption issued by the California Coastal Zone Conservation Commission.

2.2.1 Riparian/Wetland Features

Mitigation for impacts to southern willow scrub riparian vegetation and Waters of the U.S. within Drainages A, B, and D as well as wetland habitats in the lowlands subject to the jurisdiction of the ACOE, RWQCB and/or the CCC is proposed through the establishment of riparian and wetland communities, enhancement of riparian habitats in Drainages A, B, and C, and additional restoration for temporary impacts to riparian and wetland vegetation communities in the mesa and lowland areas. Table 1 illustrates the impacts and proposed mitigation acreages by Impact Type and Jurisdiction.

Table 1
Impacts to Riparian, Wetlands, and Waters of the U.S. by
Jurisdiction and Impact Type and Proposed Mitigation Acreage

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation (Acres)
<i>U.S. Army Corp of Engineers / Regional Water Quality Control Board</i>			
<i>Permanent Non-Wetlands Waters of the U.S. Impacts</i>			
Abandonment/Remediation and Development Plan	-	-	-
Development Plan	0.01	1:1	0.01
<i>Subtotal Non-Wetland Waters - Permanent</i>	<i>0.01</i>	<i>1:1</i>	<i>0.01</i>
<i>Permanent Wetland Communities Impacts</i>			
Abandonment/Remediation and Development Plan	0.016	3:1	0.048
Development Plan	0.003	3:1	0.009
<i>Subtotal Wetland Communities - Permanent</i>	<i>0.019</i>	<i>3:1</i>	<i>0.057</i>

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 1
Impacts to Riparian, Wetlands, and Waters of the U.S. by
Jurisdiction and Impact Type and Proposed Mitigation Acreage

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation (Acres)
<i>Temporary Non-Wetlands Waters of the U.S. Impacts</i>			
Abandonment/Remediation – Open Space/Restoration	-	-	-
<i>Subtotal Non-Wetland Waters - Temporary</i>	-	-	-
<i>Temporary Wetland Communities Impacts</i>			
Abandonment/Remediation– Open Space/Restoration	16.65	1:1	16.65
<i>Subtotal Wetland Communities - Temporary</i>	16.65	1:1	16.65
Total Non-Wetlands Waters of the U.S. Impacts and Mitigation	0.01		0.01
Total Development Plan Non-Wetlands Waters of the U.S. Impacts and Mitigation	0.01		0.01
Total Wetland Communities Impacts and Mitigation	16.67		16.70
Total Development Plan Wetland Communities Impacts and Mitigation	0.003		0.009
<i>CA Department of Fish and Wildlife</i>			
<i>Permanent Streambed/Riparian Impacts</i>			
Abandonment/Remediation and Development Plan	0.109	3:1	0.326
Development Plan	0.270	3:1	0.810
<i>Subtotal Streambed/Riparian - Permanent</i>	<i>0.379</i>	<i>3:1</i>	<i>1.136</i>
<i>Temporary Streambed/Riparian Impacts</i>			
Abandonment/Remediation– Open Space/Restoration	0.879	1:1	0.879
<i>Subtotal Streambed/Riparian - Temporary</i>	<i>0.879</i>	<i>1:1</i>	<i>0.879</i>
Total Streambed Riparian Impacts and Mitigation	1.258		2.015
Total Development Plan Streambed Riparian Impacts and Mitigation	0.27		0.81
<i>Coastal Commission</i>			
<i>Permanent Riparian Communities Impacts</i>			
Abandonment/Remediation and Development Plan	-	-	-
Development Plan	0.073	3:1	0.218
<i>Subtotal Riparian Communities - Permanent</i>	<i>0.073</i>	<i>3:1</i>	<i>0.218</i>
<i>Permanent Wetland Communities Impacts</i>			
Abandonment/Remediation and Development Plan	-	-	-
Development Plan	0.278	3:1	0.832
<i>Subtotal Wetland Communities - Permanent</i>	<i>0.278</i>	<i>3:1</i>	<i>0.832</i>
<i>Temporary Riparian Communities Impacts</i>			
Abandonment/Remediation – Open Space/Restoration	-	-	-
<i>Subtotal Riparian Communities - Temporary</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>
<i>Temporary Wetland Communities Impacts</i>			
Abandonment/Remediation – Open Space/Restoration	-	-	-
<i>Subtotal Wetland Communities - Temporary</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>
Total Riparian Communities Impacts and Mitigation	0.073		0.218
Total Wetland Communities Impacts and Mitigation	0.278		0.832

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

2.2.2 Seasonal Features and Vernal Pool Watershed San Diego Fairy Shrimp Habitat

The proposed Project creates permanent and/or temporary impacts to portions of seasonal wetland depression features and vernal pools found on the mesa (Table 2). Permanent impacts are proposed to occur to Feature E which supports the San Diego fairy shrimp, and portions of an additional 29 seasonal features and/or vernal pools that exist under ACOE, RWQCB, and/or CCC jurisdiction. Permanent impacts will total 0.23 acres. Permanent impacts to seasonal features and/or vernal pools supporting San Diego fairy shrimp will be mitigated at a higher 4:1 mitigation to impact ratio. Permanent impacts to the remaining seasonal features and/or vernal pools will be mitigated at a 1:1 mitigation to impact ratio. Temporary impacts are proposed to occur to portions of 2 vernal pools and 14 seasonal features, totaling 0.60 acres. Temporary impacts, if any, to seasonal features and/or vernal pools that support San Diego fairy shrimp will be mitigated at a higher 2:1 ratio. All other temporary impacts will be mitigated in-place and in-kind at a 1:1 mitigation to impact ratio.

Table 2
Impacts to Vernal Pools and Seasonal Features by Feature Name

Jurisdictional Feature	Area (Acres)	Abandonment/Remediation and Development Plan Permanent Impacts (Acres)			Abandonment/Remediation Open Space/Restoration Temporary Impacts (Acres)		
		USACE Wetlands	RWQCB	CCC	USACE Wetlands	RWQCB	CCC
San Diego Fairy Shrimp Occupied							
VP1	0.304	—	—	—	0.304	0.304	0.283
VP2	0.021	—	—	—	0.021	0.021	0.017
VP3	0.006	—	—	—	0.006	0.006	0.004
E	0.049	0.049	0.049	—	—	—	—
G	0.003	—	—	—	0.003	0.003	—
H	0.021	—	—	—	0.021	0.021	—
I	0.028	—	—	—	0.028	0.028	—
J	0.087	—	—	—	0.087	0.087	0.054
Subtotal	0.520	0.049	0.049	0.000	0.471	0.471	0.359
Not San Diego Fairy Shrimp Occupied							
B	0.030	—	0.030	—	—	—	—
C	0.001	—	0.001	—	—	—	—
D	0.002	—	0.002	—	—	—	—
F	0.030	—	0.030	—	—	—	—
K	0.014	—	—	—	—	0.014	0.014
L	0.003	—	—	—	—	0.003	0.003

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 2
Impacts to Vernal Pools and Seasonal Features by Feature Name

Jurisdictional Feature	Area (Acres)	Abandonment/Remediation and Development Plan Permanent Impacts (Acres)			Abandonment/Remediation Open Space/Restoration Temporary Impacts (Acres)		
		USACE Wetlands	RWQCB	CCC	USACE Wetlands	RWQCB	CCC
M	0.014	—	0.014	—	—	—	—
N	0.029	—	0.029	—	—	—	—
O	0.004	—	0.004	—	—	—	—
P	0.009	—	0.009	—	—	—	—
Q	0.004	—	0.004	—	—	—	—
R	0.006	—	0.006	—	—	—	—
S	0.003	—	0.003	—	—	—	—
T	0.004	—	0.004	—	—	—	—
U	0.002	—	0.002	—	—	—	—
V	0.002	—	—	—	—	0.002	—
X	0.007	—	—	—	—	0.007	—
Y	0.001	—	—	—	—	0.001	—
Z	0.007	—	0.007	—	—	—	—
AA	0.002	—	0.002	—	—	—	—
BB*	0.002	—	0.002	0.002	—	—	—
CC	0.003	—	0.003	—	—	—	—
DD	0.003	—	0.003	—	—	—	—
EE	0.003	—	0.003	—	—	—	—
FF	0.005	—	0.005	—	—	—	—
GG	0.003	—	0.003	—	—	—	—
HH	0.007	—	—	—	—	0.007	—
JJ	0.005	—	—	—	—	0.005	—
KK*	0.017	—	0.001	0.001	—	0.001	—
LL*	0.001	—	0.001	0.001	—	—	—
MM*	0.004	—	0.004	0.004	—	—	—
OO	0.001	—	—	—	—	0.001	—
PP	0.001	—	0.001	—	—	—	—
QQ	0.003	—	0.003	—	—	—	—
RR	0.001	—	0.001	—	—	—	—
SS	0.002	—	0.002	—	—	—	—
TT	0.001	—	0.001	—	—	—	—
<i>Subtotal</i>	<i>0.343</i>	<i>0.000</i>	<i>0.179</i>	<i>0.007</i>	<i>0.000</i>	<i>0.129</i>	<i>0.017</i>
Combined Total	1.15	0.049	0.228	0.007	0.471	0.60	0.372

*A portion impacted by Development Plan/Footprint only.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Vernal pool mitigation will consist of several components, including:

- The establishment of 0.846 acres of pool surface area in approximately 6-8 vernal pool features on the mesa;
- The enhancement of 0.28 acre in VP1 through the removal non-native vegetation, native vegetation uncharacteristic of vernal pools, trash and debris, and sediment;
- The restoration of 16 vernal pools that will be temporarily impacted (totaling 0.6 acres); and
- The revegetation of native grassland habitat in the watershed surrounding the established/enhanced/restored pools.

2.2.3 Raptor Foraging and Grassland Habitat

Compensatory mitigation for permanent and temporary impacts to native grassland and non-native annual grasses that represent potentially suitable habitat for foraging raptors and periodic overwintering burrowing owl will be mitigated through the establishment of purple needlegrass, annual grassland, and/or salt-tolerant transitional grasses in the lowlands, as well as native grassland restoration in temporary impact area locations. Grasslands on the site have largely been subject to historic and continuous vegetation maintenance activities. Invasive and naturalized grasses and forbs dominate all portions of the site that contain grasslands, and the purple needlegrass grassland areas on the site do not contain associate forbs or native grasses that distinguish this community as good quality habitat, which is likely due to historic and ongoing oil field vegetation maintenance activities. Accordingly, for areas of native purple needlegrass grassland habitat that are impacted by the Project, mitigation at a 0.5:1 impact to mitigation ratio is proposed. For impacts to non-native annual grasses and disturbed annual grassland areas that will be permanently or temporarily impacted through oil remediation activities, a 0.5:1 impact to mitigation ratio is proposed (Table 3).

Table 3
Impacts to Grasslands by Impact Type and Proposed Mitigation Acreage

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation (Acres)
<i>Permanent Purple Needlegrass Grassland Habitat</i>			
Abandonment/Remediation and Development Plan	3.09	0.5:1	1.55
Development Plan	6.04	0.5:1	3.02
<i>Subtotal Purple Needlegrass Grassland Mitigation</i>	<i>9.13</i>	<i>0.5:1</i>	<i>4.57</i>
<i>Permanent Undisturbed Non-Native Grassland Habitat</i>			
Abandonment/Remediation and Development Plan	14.35	0.5:1	7.18
Development Plan	18.64	0.5:1	9.32
<i>Subtotal Undisturbed Non-Native Grassland Mitigation</i>	<i>32.99</i>	<i>0.5:1</i>	<i>16.50</i>

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 3
Impacts to Grasslands by Impact Type and Proposed Mitigation Acreage

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation (Acres)
<i>Permanent Disturbed Non-Native Grassland Habitat</i>			
Abandonment/Remediation and Development Plan	0.02	0.5:1	0.01
Development Plan	0.03	0.5:1	0.02
<i>Subtotal Disturbed Non-Native Grassland Mitigation</i>	<i>0.05</i>	<i>0.5:1</i>	<i>0.03</i>
<i>Temporary Purple Needlegrass Grassland Habitat</i>			
Abandonment/Remediation – Open Space/Restoration	0.35	0.5:1	0.18
<i>Subtotal Disturbed Non-Native Grassland Mitigation</i>	<i>0.35</i>	<i>0.5:1</i>	<i>0.18</i>
<i>Temporary Undisturbed Non-Native Grassland Habitat</i>			
Abandonment/Remediation– Open Space/Restoration	0.71	0.5:1	0.35
<i>Subtotal Undisturbed Non-Native Grassland Mitigation</i>	<i>0.71</i>	<i>0.5:1</i>	<i>0.35</i>
<i>Temporary Disturbed Non-Native Grassland Habitat</i>			
Abandonment/Remediation– Open Space/Restoration	0.09	0.5:1	0.05
<i>Subtotal Disturbed Non-Native Grassland Mitigation</i>	<i>0.09</i>	<i>0.5:1</i>	<i>0.05</i>
Total Grassland Mitigation			21.68
Total Grassland Mitigation for Development Plan			12.36

2.2.4 California Gnatcatcher Upland Coastal Scrub Habitat

The proposed Project will result in permanent impacts to both disturbed and undisturbed uplands, including maritime succulent scrub (MSS), southern coastal bluff scrub (SCBS), and coastal sage scrub (CSS). Portions of the uplands vegetation communities support the federally listed threatened California gnatcatcher (*Poliophtila californica*). Impacts to undisturbed MSS, SCBS, and CSS areas will be mitigated on site at a 3:1 ratio (Table 4). Impacts to disturbed MSS, SCBS and CSS areas will be mitigated on site at a 1:1 ratio. Mitigation for impacts to disturbed and undisturbed scrub communities will be accomplished through the establishment of appropriate scrub communities in areas that are currently ruderal, disturbed scrub, or developed. Through oil remediation efforts, the Project will also result in temporary impacts to undisturbed and disturbed MSS, SCBS and CSS, which will be mitigated through in-place restoration efforts at a 1:1 ratio.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 4
Scrub Impacts and Proposed Mitigation Acreage

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation (Acres)
<i>Permanent Scrub Habitat</i>			
Abandonment/Remediation and Development Plan	2.0	3:1	6.0
Development Plan	0.86	3:1	2.58
<i>Subtotal Scrub Mitigation</i>	<i>2.86</i>	<i>3:1</i>	<i>8.58</i>
<i>Permanent Disturbed Scrub Habitat</i>			
Abandonment/Remediation and Development Plan	6.33	1:1	6.33
Development Plan	2.66	1:1	2.66
<i>Subtotal Disturbed Scrub Mitigation</i>	<i>8.99</i>	<i>1:1</i>	<i>8.99</i>
<i>Temporary Scrub Habitat</i>			
Abandonment/Remediation – Open Space/Restoration	4.23	1:1	4.23
<i>Subtotal Scrub Mitigation</i>	<i>4.23</i>	<i>1:1</i>	<i>4.23</i>
<i>Temporary Disturbed Scrub Habitat</i>			
Abandonment/Remediation– Open Space/Restoration	5.53	1:1	5.53
<i>Subtotal Disturbed Scrub Mitigation</i>	<i>5.53</i>	<i>1:1</i>	<i>5.53</i>
Total Scrub Mitigation	21.61		27.33
Total Scrub Mitigation for Development Plan	3.52		5.24

2.3 Public Benefits

2.3.1 Integrated Public Access/Recreation and Resource Conservation

The Project includes an extensive and integrated plan to establish new public access and recreational resources on the site along with enhanced open space and sensitive habitat areas. The plan has been designed as an interlinking network of trails, parks, and open space intended for diverse public use, wildlife habitat protection, and for ensuring future preservation of open space and recreational resources. Specifically, the plan has been developed to meet the following public access, recreation and resource protection objectives:

- Provide public access and recreation opportunities to the maximum extent feasible for both local and non-local visitors, and for visitors with diverse backgrounds, interests, ages, and abilities.
- Design and develop trail connections throughout the site to increase accessibility to and enjoyment of coastal resources for all people.
- Provide critical trail links to support a continuous inland to coast public access trail system that provides views of the Santa Ana River Valley and the coast.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

- Facilitate implementation of the California Coastal Trail vision to “Create linkages to other trail systems and to units of the State Park system, and use the Coastal Trail system to increase accessibility to coastal resources from urban population centers.” (Completing the California Coastal Trail, Coastal Conservancy 2003.)
- Connection to, and facilitation of a portion of the Santa Ana River Trail.
- Provide facilities that support public outreach for park and trail users, including educational and recreational programs for visitors with diverse backgrounds, interests, ages, and abilities.
- Encourage non-vehicular circulation between park areas, and emphasize bicycle and pedestrian circulation between park areas and the shoreline as a primary form of circulation.
- Protect and enhance, wherever feasible, sensitive habitats and water quality when developing public access and recreational facility improvements.
- Establish public access and recreational uses consistent with resource protection needs, taking into consideration available support facilities, public safety issues, and neighborhood compatibility.
- Prevent degradation of sensitive habitat areas from intense and/or unrestricted public use by 1) revegetating degraded areas with native plants, 2) provision of support facilities such as defined parking areas and trail corridors, educational signage and trash receptacles, and 3) provision of a uniform park and trail sign plan essential for identifying park areas, allowed uses, support facilities and sensitive habitats.

Public Interpretative Trails

As a component of the overall Project trails, a diverse system of public interpretive trails would be developed within the Natural Open Space Preserve. This trail system would provide connections to the proposed North and South Bluff Park located on the mesa, Santa Ana River Regional Trail System, and Talbert Nature Reserve.

The major components of the Interpretive Trail System are summarized below:

- 2.0-mile-long lowland Interpretive Trail would connect the existing Santa Ana River Regional Trail System and Talbert Nature Preserve located adjacent to the Project Site;
- 0.3-mile-long Southern Arroyo Trail would connect open space with trails and footpaths planned for development in the North and South Bluff Park;
- 0.4-mile-long Bluff-toe Trail would be located almost entirely within the non-exclusive access easement and which is also used as the Oil Access Road (SPA 5b) and Orange

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

County Sanitation District easement connecting the two remainder oil operations sites. This trail parallels the Semeniuk Slough and connects to the Bluff Park Trail System adjacent to the Resort Colony and Family Villages; and

- 0.8-mile-long Upland Interpretive Trail would connect the Talbert Trailhead/Staging Area with the corner of Talbert Nature Preserve and the Project's lowland Interpretive Trail.

To avoid habitat impacts, interpretive trails have been designed to follow existing oil roads within the Project site to the extent feasible. The 9.5 acres of Public Interpretive Trails would be located within 10-foot-wide public easements as designated on the Project subdivision map. Within the 10-foot-wide trail easements, generally six feet would be trail surface area and a maximum two-foot transition to native ground would be provided adjacent to each side of the trail surface for a maximum total improved area of 10 feet. The trail surface would consist of native soil or decomposed granite and would meander and/or become narrower or incorporate sections of elevated walkways as necessary to avoid identified special-status habitats.

Public Interpretive Parks

Proposed Interpretive Parks would be located on the periphery of the Natural Open Space Preserve and would incorporate active and passive recreation facilities, including a vernal pool interpretive area and trailheads for the Interpretive Trail System in the Natural Open Space Preserve. The Interpretive Parks would contain viewing decks interpretive exhibits and signage with information on the history of the Project Site and on the native plants and wildlife of the area.

The Vernal Pool Interpretive Area Park would provide public access via a walkway near the edge of the vernal pool restoration complex sign kiosks and displays so that visitors can experience and learn about the ecology of vernal pools and San Diego fairy shrimp. The Vernal Pool Interpretive Area Park would be planted with native grasslands providing a vegetated buffer between the vernal pool restoration complex and adjacent development.

Talbert Trailhead Area

Located along the Upland Interpretive Trail west of North Bluff Road, the 0.1-acre Talbert Trailhead Area would serve as an informational stop for pedestrians and bicyclists using the Natural Open Space Preserve Interpretive Trail system. The trailhead would provide a viewing platform to the Natural Open Space Preserve and interpretive signage providing directional information on the Upland and lowland Interpretive Trails and the points of connection from the Interpretive Trail system to existing regional trails located adjacent to the Project Site.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Additional Development Plan Pedestrian and Bicycle Access

The Project also proposes substantial public parking resources, a Bluff Park that extends along the edges of the South and North Family Villages, pedestrian paths, and on-street bicycle trails to provide coastal access and public mobility within the Project site. The pedestrian and bicycle trails would provide connectivity among open space, parks, residential, commercial and mixed-uses on and adjacent to the site, as well as public access and connections to existing walks and trails extending along West Coast Highway and the beach located to the south.

Public Parking

Public parking would be provided throughout the Project site to support access to and use of the proposed parklands and trail system. More than 200 on-street public parking spaces would be provided on Scenic Drive, and more than 150 off-street public parking spaces would be provided within the Community Park areas. In addition, public off-street parking would be provided as shared parking within the Resort Inn and the Urban Colony mixed-use commercial/residential development within the Project site, including for use by coastal recreationists and park users as capacity permits.

Bluff Park

The 15.1-acre Bluff Park is proposed as a linear park system intended to provide active and passive recreation facilities, including approximately two miles of public pedestrian trails. Bluff Park is comprised of two subareas referred to as South Bluff Park and North Bluff Park.

South Bluff Park extends along the perimeter of the Resort Colony and South Family Village adjacent to the Natural Open Space Preserve. South Bluff Park is proposed as a passive park providing view opportunities from the Resort Colony edge toward the Pacific Ocean and views of open space from the South Family Village edge. Public recreational facilities would include scenic view overlooks with public seating, a pedestrian trail with connections to the open space interpretive trail system, and a multi-use trail that links to the pedestrian and bicycle bridge across West Coast Highway. Interpretive signage would be provided along the length of the multi-use trail.

North Bluff Park extends along the perimeter of the North Family Village adjacent to the Natural Open Space Preserve and east of North Bluff Road along the northern edge of the Urban Colony. North Bluff Park is proposed to provide active recreational facilities including informal play areas for children, tot lots, and a public amphitheater. Passive recreational facilities would include a pedestrian trail with connections to the Natural Open Space Preserve

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Interpretive Trail system, picnic areas, and scenic view overlooks to be provided along the length of the pedestrian trail.

Pedestrian and Bicycle Bridge

A pedestrian and bicycle bridge is proposed to cross over West Coast Highway from the Project site connecting to a location south of West Coast Highway providing public coastal access to and from the beach and the Project's open space areas.

On Street Bicycle Trails and Amenities

Five-foot-wide on-street bicycle trails are proposed for both sides of arterial roadways including Bluff Road, North Bluff Road, 17th Street, and 15th Street. Bike racks would be provided as a part of the proposed neighborhood retail center, parks, and the multi-family residential uses.

Pedestrian Paths

All streets within the Project site are proposed to have sidewalks separated from the street. Sidewalks would vary in width from four to eight feet.

2.3.2 On-Site and Off-Site Water Quality Improvements

The Project includes the construction of new drainage, flood control, and water quality facilities as set forth in the Project's Master Drainage Plan and Water Quality Management Plan. The proposed project Water Quality Management Plan, when combined with oil facility consolidation, abandonment and remediation and the proposed Mitigation Project, would significantly restore and enhance hydrology patterns and water treatment opportunities across the site. The proposed Water Quality Management Plan would address existing deficiencies of drainage and water quality treatment facilities in the project area with improvements that would curtail excessive runoff to arroyos, redirect runoff away from bluffs, and reduce flow rates and volumes of untreated runoff to the Semeniuk Slough and the Santa Ana River, resulting in an improvement over existing site runoff conditions with respect to water quality, velocities, and volumes.

The Project proposes that water quality features and Best Management Practices be implemented in three sequential zones of development categorized as the Interior Development Zone, Transitional Zone, and Perimeter Zone.

Interior Development Zone

The Interior Development Zone refers to the Project's development areas. Water quality treatment for these areas would initiate at the source of the runoff through the incorporation of

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

LID features into the Project's design. LID features could include pocket rain gardens within impervious areas such as courtyards and common areas, porous/permeable paving integration into traditional impermeable paved areas, landscaped stormwater planters, and use of cisterns for capturing rainwater for re-use from buildings (condominiums, flats, attached units, resorts, etc.).

Transitional Zone

The transitional zone includes streets, walkways, and open spaces into and out of the central residential, resort inn, and mixed-use/residential development areas. LID features proposed in the Transitional Zone would focus on water quality treatment along the backbone roads of the Project. Water quality measures incorporated into these roadways would include slotted curbs to promote low flow diversion into treatment areas and bioswales with biofiltration zones (biocells) within the landscape setback areas.

Perimeter Zone

Water quality treatment would be located in perimeter zones where a final "polishing" through natural processes would occur. Proposed water quality features would include bioswales and bioretention zones to further treat runoff previously treated by the Interior Development Zone or Transitional Zone. Treatment would include native habitat for water quality pollutant removal and sub-drains to mimic natural infiltration processes and minimize standing water.

Within perimeter zones, the Project's treatment-control BMPs also include water quality basins designed to retain, infiltrate, filter, and/or treat runoff volumes generated from the Project and from adjacent off-site areas. Water quality treatment and polishing basins (i.e., finishing basins) are included in the Project to provide the final treatment of runoff for certain portions of the site.

Water Quality Basins

The Project proposes water quality basins along the perimeter of the development areas adjacent to the bluff tops. For these water quality basins, infiltration is not recommended due to adjacency to the bluff and the potential for subsurface seepage through the arroyo canyon walls. Therefore, these basins would be lined, and treated flows would be discharged in a controlled manner to the arroyo canyon bottom for evapotranspiration and habitat benefits.

Regional Water Quality Basin (Mesa)

One water quality/detention basin is proposed near the Project entrance at 16th Street to accommodate treatment of urban runoff from adjacent off-site areas to the Southern Arroyo. The off-site drainage area located within the City of Costa Mesa and the City of Newport Beach

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

encompasses approximately 48 acres and is completely developed. This regional water quality basin would provide treatment for approximately 2.3 acre-feet of water quality treatment, which represents all urban runoff (dry weather) and almost the entire first-flush storm water event. In addition, the basin would also provide detention capabilities to reduce peak flow velocities that discharge into the Southern Arroyo.

Water Quality/Diffuser Basins (Lowland)

An on-site water quality treatment basin is proposed within the lowland of the Project site, just north of the North Family Village. This basin would be located above the 100-year floodplain and would also serve as a diffuser basin to control the rate at which water drains from the upland down to the lowland. Although this basin would have sufficient treatment capacity to treat all flows from the upstream drainage area (6 acre-feet of treatment volume) in combination with the established treatment efficiency of the upstream LID features, only 2.3 acre-feet of treatment capacity would actually be required. Treated flows from this basin would remain on site and would be discharged into the lowland for infiltration, evapotranspiration, and habitat nourishment benefits. An additional diffuser basin is proposed in the lowland, which would collect flows from development areas adjacent to the Southern Arroyo and provide energy dissipation of flows prior to entering the Semeniuk Slough. Both of the lowland basins would be planted with native emergent marsh and riparian species to promote water quality cleaning and natural energy dissipation.

Additional Water Quality Benefits

In addition to the specific water quality features discussed above, the proposed Project would result in overall water quality benefits by restoring the large majority of the site to natural open space, thus restoring the site's primary hydrologic features that have been modified by prior oil field development and ongoing oil field operations. The proposed Natural Open Space Preserve, encompassing all of the site's primary drainages, in conjunction with the Mitigation Project, would restore, enhance, and preserve these hydrological features, thereby improving the quality of water conveyed through the drainages from off- and on-site sources, including more than 100 acres of untreated stormwater runoff presently conveyed onto the site from adjacent developed areas. Improved water quality conditions across the site would enhance the ecological value of the site's hydrologic features and adjacent areas to better support sensitive habitat area, special-status species, and wildlife (see also Section 3.0 for additional discussion of functions and services of planned riparian and wetland habitats).

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

2.3.3 Aesthetic Improvements

The Project would provide public access to views of scenic resources both on the Project site through the restoration and conservation of native habitat and wetlands and to views of off-site scenic resources including the nearby shoreline and Pacific Ocean, which are not currently available given that the site is private property. The Project's trails would connect to existing off-site regional trails and create public views overlooking the open space areas of the Project and the ocean. The Bluff Park Trail is proposed as an off-street pedestrian trail extending around the perimeter of the Resort Colony, South Family Village, and North Family Village adjacent to the open space, and would include footpaths and interpretive trails extending along the length of the bluff providing visual access to the shoreline and natural habitat areas.

Project implementation would change the overall visual character of the Project site from an oilfield to an urban infill community, characterized by a mix of clustered development areas, open space and natural habitat areas. The majority of the property would be retained in open space, which would be the predominant visual feature of the site, while the proposed development would be limited to clustered development envelopes with the urbanized areas of Costa Mesa and Newport Beach forming the backdrop of the site as viewed from coastal areas to the west.

2.4 Long-term Ownership Monitoring and Management

2.4.1 Ownership and Stewardship of Open Space

The 257-acre Natural Open Space Preserve will remain protected as permanent natural lands and open space through the establishment of a conservation easement, and is anticipated to be managed by the Newport Banning Land Trust (NBLT). NBLT was established in 2012 as an independent, non-profit organization with a mission to provide long-term stewardship of the Natural Open Space Preserve by working to preserve and enhance the natural values of the land and to ensure that the open space is enjoyed by future generations and provides public access and outdoor recreation connectivity. NBLT has negotiated a Memorandum of Understanding (MOU) with NBR that would provide the framework for the anticipated transaction to allow the NBLT to assume stewardship responsibility for the Natural Open Space Preserve.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

3.0 MITIGATION IMPLEMENTATION PLAN FOR RIPARIAN AND WETLAND AREAS

According to 33 CFR 332.3 (b), the ACOE guidance requires that applicants first consider mitigation banking opportunities and in-lieu fee program credits prior to conducting permittee-responsible mitigation. However, this guidance also states that the compensatory mitigation should be located within the same watershed as the impact site. Mitigation banking opportunities or in-lieu fee program credits are not available within the watersheds that occur on the NBR project site; therefore, permittee-responsible mitigation through on-site mitigation will be conducted.

For the ACOE, compensatory mitigation can be carried out through four methods that replace lost functions and services of jurisdictional areas: the restoration of a previously existing wetland or other aquatic site, the enhancement of an existing aquatic site's functions, the establishment (i.e., creation) of a new aquatic site, or the preservation of an existing aquatic site (ACOE 2008). This HCCMP describes establishment, enhancement, and restoration as compensatory mitigation for impacts to jurisdictional resources. The vegetation communities to be established and enhanced are described in Section 3.1.2 and 3.1.3.

3.1 Goals of the Proposed Mitigation

The primary goal of the riparian and wetland mitigation and monitoring component of the Mitigation Project is to ensure that impacts from oil field abandonment, remediation and the Project to jurisdictional riparian and wetland areas through implementation are fully mitigated in accordance with the ACOE Compensatory Mitigation Rule (ACOE 2008), RWQCB 401 certification requirements, CDFW code, Section 1600, and Section 30233 of the Coastal Act. In addition, the Mitigation Project is intended to satisfy a deferred restoration obligation for 2.87 acres of mitigation in the lowlands required by the RWQCB.

Secondary goals of the Project are to improve the hydrology within the drainages and lowland areas of the site and to improve the overall habitat values within the Mitigation Project area. This will be accomplished through establishment efforts that involve creating additional acreage of riparian and wetland habitat through grading and revegetation, and through enhancement efforts that will involve the removal of exotic species and subsequent revegetation.

Enhancement of riparian and wetland areas in the mesa and lowland areas that currently support ruderal, developed, and other disturbed vegetation community types will be converted to native riparian vegetation communities in an additional effort to increase aquatic functions and services. In addition, disturbed southern willow scrub areas will be enhanced through the removal of

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

invasive tree and shrub species, with subsequent planting and seeding of these areas with appropriate riparian species to improve the native cover and diversity.

Where appropriate, scrub or grassland restoration will occur along the upland banks of riparian areas, increasing the buffer areas along the drainages and providing habitat connectivity for native avian species.

All proposed establishment and enhancement activities in the wetland and riparian areas on site will have the goal of establishing vegetation communities that are self-sustaining and functional beyond the interim maintenance and monitoring period.

3.1.1 Target Acreages for Mitigation

The Project development footprint has been designed to avoid or minimize impacts to jurisdictional resources existing on site to the maximum extent practical. A majority of the impacts, as illustrated in Table 1 are associated with the oil remediation and abandonment activities that are proposed to occur to facilitate the implementation of both the Project and Mitigation Project. Table 5 illustrates the riparian and wetland mitigation that is proposed to occur to mitigate for permanent and temporary impacts to jurisdictional riparian and wetland resources. Temporary impacts may be less than proposed and, subsequently, restoration acreages would be reduced accordingly.

Table 5
Summary of Proposed Mitigation by Impact and Habitat Types for
Temporary and Permanent Impacts to Riparian and Wetland Habitats

Impact type	Impact Totals	Mitigation Ratio	Mitigation Required (acres)	Mitigation Type	Mitigation proposed (acres)	Mitigation Habitat Type
Permanent Riparian ¹	0.379	3:1	1.14	Riparian establishment	1.04	Southern willow scrub/mulefat scrub
				Riparian enhancement	3.15	
Temporary Riparian ²	0.879	1:1	0.879	In-kind riparian restoration	14.64*	Southern willow scrub/mulefat scrub
Permanent Wetland	0.019	3:1	0.057	Wetland establishment	0.83	Salt marsh
Temporary Wetland	16.65	1:1	16.65	In-kind wetland restoration	11.36**	Salt marsh/alkali meadow

¹ All permanent impacts are associated with development impacts.

² All temporary impacts are associated with oil field remediation.

* Includes the temporary impact restoration areas that are currently CCC exempt, as well as 5.29 acres of ACOE wetland restoration areas.

** Wetland restoration areas in the lowlands primarily exhibit a saline nature. However, approximately 5.29 acres of temporary impacts to ACOE wetland habitats appear to be more freshwater in nature, and therefore are treated under the riparian mitigation category.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

3.1.2 Vegetation Communities to be Established and Restored Mitigation

The riparian vegetation communities proposed to be established and restored include southern willow scrub and mulefat scrub. The wetland vegetation communities proposed to be established and restored include salt marsh and alkali meadow habitats. The character and species composition of the vegetation communities are intended to be consistent with the character and species composition of existing native habitats in the vicinity of the Project (see Section 3.2). The species composition is outlined in the proposed plant palettes described in Section 3.6.

3.1.3 Vegetation Communities to be Enhanced

Enhancement is proposed to occur in existing disturbed riparian and wetland areas within the Project site. Disturbance on site ranges from exotic encroachment from common species, such as poison hemlock (*Conium maculatum*) and tree tobacco (*Nicotiana glauca*), to large swaths of invasive non-natives such as giant reed (*Arundo donax*), salt cedar (*Tamarix* sp.) and pampas grass (*Cortaderia selloana*) that have significantly altered the hydrology of the drainages. The drainages proposed for enhancement include large patches of arroyo willow and mulefat species intermixed with the non-native and invasive species. Enhancement in these disturbed areas will protect adjacent healthy southern willow scrub and mulefat scrub communities from future weed encroachment.

Habitats that will be enhanced include southern willow scrub and mulefat scrub communities. In the enhancement areas, a targeted, selective approach to control the invasive species will be employed to limit damage to existing native vegetation. The removal of these invasive species will free water and nutrients to be used by the newly established plants and promote autogenic repair of these habitats. Additionally, the removal of exotic species will reduce the amount of non-native seed propagules over the entire Natural Open Space Preserve. Bare areas left from the removal of invasive species will be planted with appropriate native species, as outlined in Section 3.6.

3.2 Functions and Services of Riparian and Wetland Areas to be Impacted

As noted above, the project will have impacts to areas subject to the jurisdiction of the ACOE, RWQCB, CDFW, and CCC. Temporary and/or permanent impacts will occur in Drainages A, B, and D, as well as the lowlands (Figure 4a–d). A majority of the riparian and wetland mitigation resulting from the Project is the result of temporary impacts in the lowland areas, which are associated with remediation of the oilfield and necessary for the purpose of restoring the lowlands (Figures 5 and 6a–c). Permanent impacts resulting from the installation of the development plan footprint are proposed to occur to only 0.379 acres of riparian habitat (CDFW jurisdiction) and 0.278 acres of wetland habitat (CCC jurisdiction).

3.2.1 Drainages A, B, C, and D

Drainage A is located near the northeastern corner of the site, originating at the eastern property boundary where a concrete culvert discharges stormwater runoff and nuisance flows onto the site

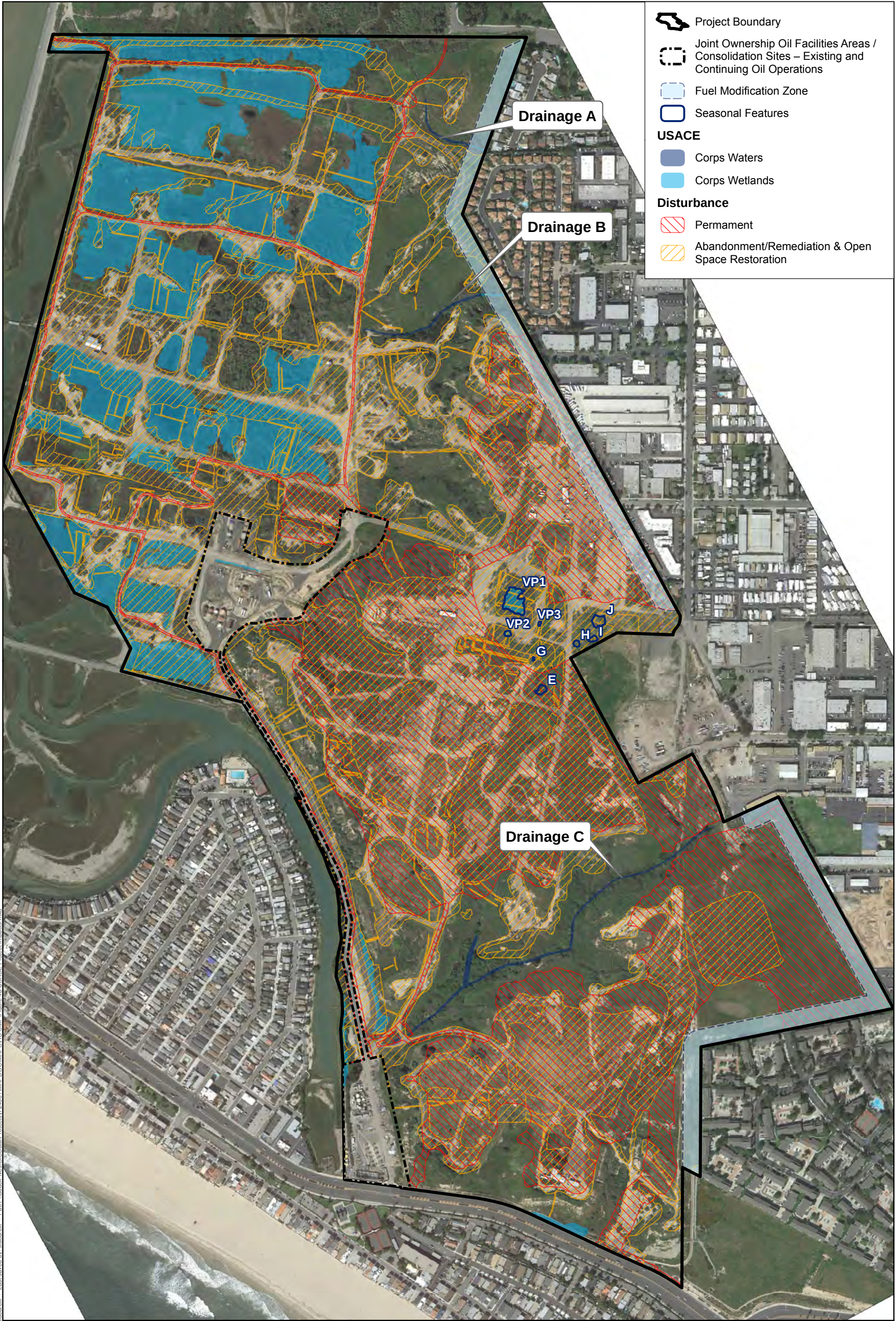
Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

(GLA 2008). Corps jurisdictional wetlands are limited to the upper portion of this drainage, due to limited hydrophytic vegetation at the southwestern edge of the drainage. Dominant species include arroyo willow (*Salix lasiolepis*), black willow (*Salix gooddingii*), and southern cattail (*Typha domingensis*). Drainage A supports primarily disturbed mulefat (*Baccharis salicifolia*) communities, except where flows are most concentrated in the east where arroyo willow thicket is dense. Drainage A drains into the northernmost portion of the lowland areas and supports minimal riparian vegetation at the toe of slope. The Drainage supports a denser and healthier riparian black willow and mulefat thicket along the northernmost boundary of the lowlands, which supports sensitive species such as the least bell's vireo. Riparian establishment and enhancements are proposed in Drainage A, which will serve to enhance and hydrologically connect the upper, less biologically diverse portions of the Drainage to healthier riparian communities to the east.

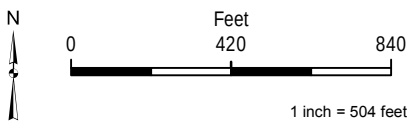
Drainage B, the Middle Arroyo, is located in the upper portion of the site, originating at the eastern property boundary where a concrete culvert discharges stormwater runoff and nuisance flows onto the site (GLA 2008). Corps jurisdictional areas are limited to the upper portion of the drainage where runoff from off-site development are more prevalent. Dominant native species include arroyo willow, black willow, and mulefat and dominant non-natives include giant reed (*Arundo donax*), cocklebur (*Xanthium strumarium*), bristly ox-tongue (*Picris echioides*), and pampas grass (*Cortaderia selloana*). Riparian enhancement is proposed in Drainage B because the upper portions of the Drainage are heavily populated with golden wattle acacia (*Acacia* sp.) species and lower non-jurisdictional portions of the drainage support only disturbed mulefat. These enhancements will aim to restore the hydrology on site and connect to proposed establishment areas downstream of Drainage B.

Drainage C, also known as the large arroyo, is a high-functioning drainage located near the southern portion of the project site, and includes one tributary swale. Drainage C is the least disturbed drainage on site. Dominant vegetation includes arroyo willow, black willow, pampas grass, black mustard (*Brassica nigra*), myoporum (*Myoporum laetum*), mulefat, and Hottentot fig (*Carpobrotus edulis*). Heavily disturbed areas exist above the banks of Drainage C, therefore a majority of the scrub and grassland establishment and enhancement mitigation is proposed along the upland portions of this Drainage.

Drainage D is a CDFW jurisdictional erosional feature covering about 0.18 acre, which carries only ephemeral flows. The feature is located near the southern boundary of the property in a north-south trending canyon that was created when "borrow material" was removed in connection with regional highway improvements during the 1960s. The erosional feature originates approximately 1,000 feet from the property boundary at Pacific Coast Highway (PCH), extending toward PCH for approximately 700 feet to where the feature becomes indistinct. Only approximately 200 linear feet of this feature contains riparian vegetation, consisting of arroyo willow and mulefat, however, much of this feature also supports sizeable, dense patches of hottentot fig.



- Project Boundary
- Joint Ownership Oil Facilities Areas / Consolidation Sites – Existing and Continuing Oil Operations
- Fuel Modification Zone
- Seasonal Features
- USACE**
 - Corps Waters
 - Corps Wetlands
- Disturbance**
 - Permanent
 - Abandonment/Remediation & Open Space Restoration



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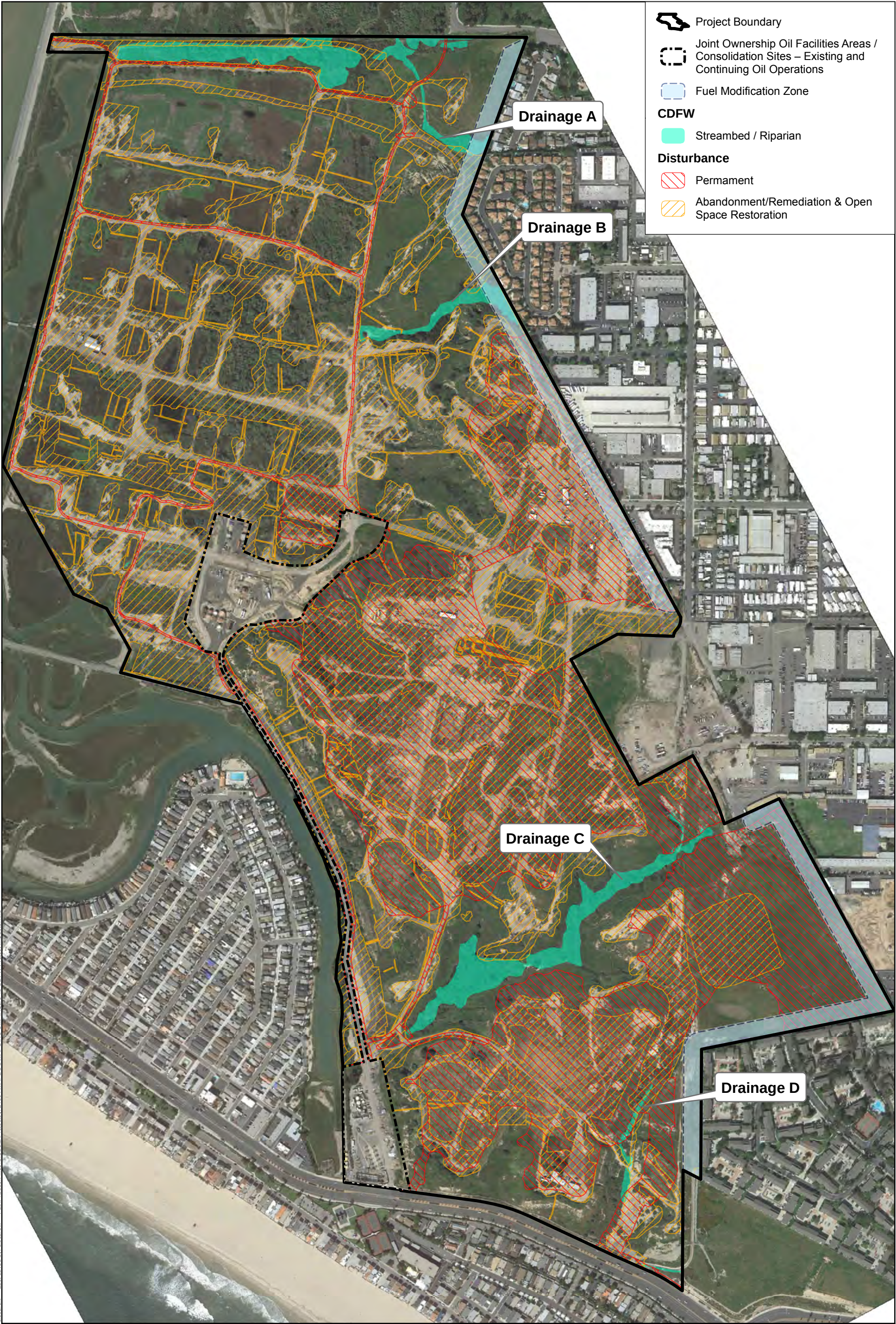
SOURCE: Jurisdiction Layers (GLA & Dudek), Project Footprint (Fuscoe Engineering), Abandonment/Remediation (Fuscoe Engineering & Dudek)

NEWPORT BANNING RANCH

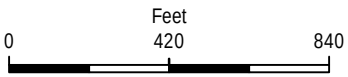
Figure 4a
USACE Project Impacts

Habitat Conservation and Conceptual Mitigation Plan

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- Project Boundary
- Joint Ownership Oil Facilities Areas / Consolidation Sites – Existing and Continuing Oil Operations
- Fuel Modification Zone
- CDFW**
 - Streambed / Riparian
- Disturbance**
 - Permanent
 - Abandonment/Remediation & Open Space Restoration



1 inch = 504 feet

SOURCE: Jurisdiction Layers (BonTerra & Dudek), Project Footprint (Fuscoe Engineering), Abandonment/Remediation (Fuscoe Engineering & Dudek)

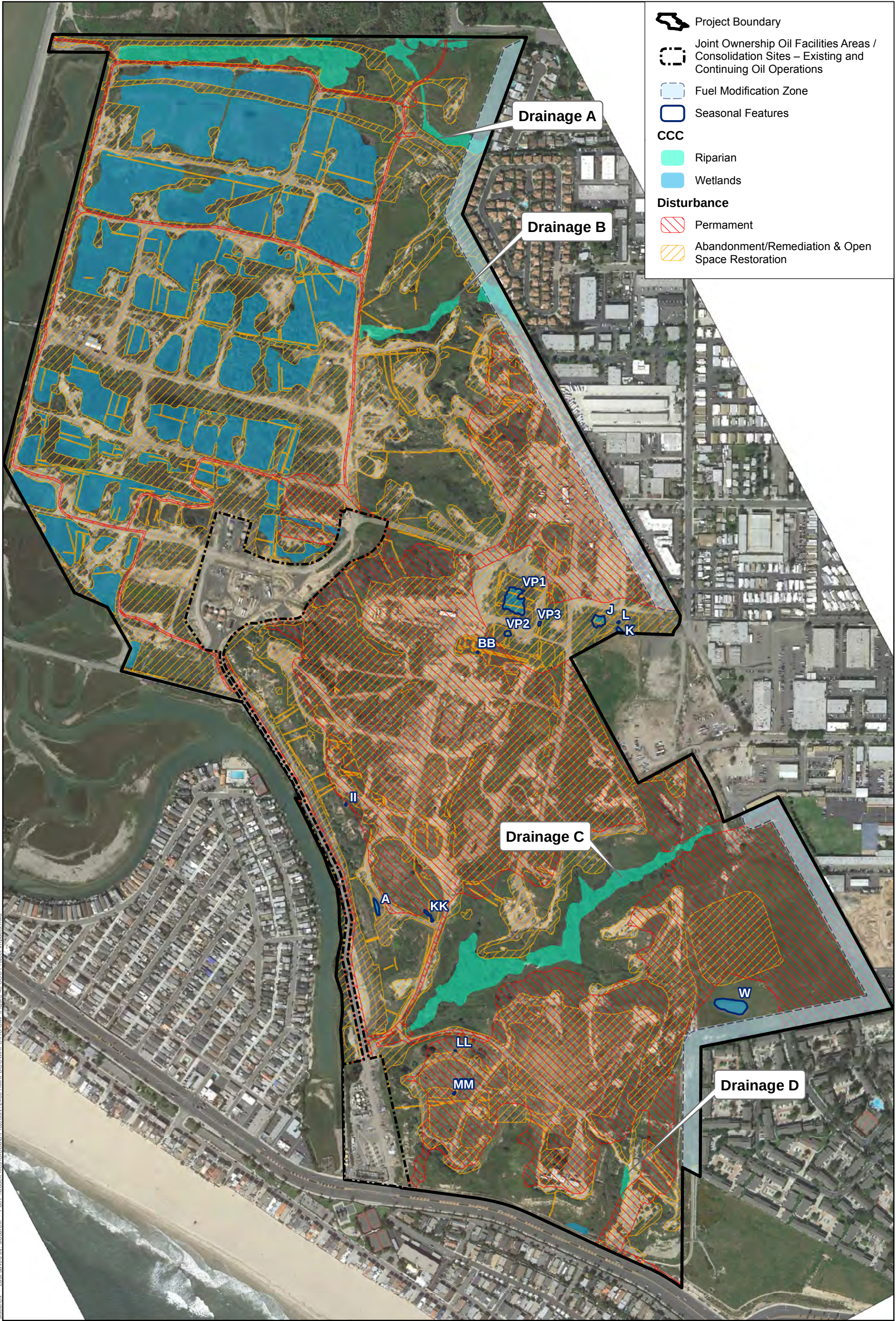
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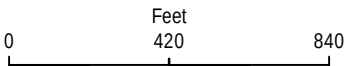
Habitat Conservation and Conceptual Mitigation Plan

Figure 4b
CDFW Project Impacts

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Date: 10/10/2013 - Created by: silcarelli - Last saved by: silcarelli - Path: \\dudek\files\GIS\Bata\Projects\1724801\MAPDOC\MAPS\HCH\CMPL\Figure 4c CCC Project Impacts.mxd



1 inch = 504 feet

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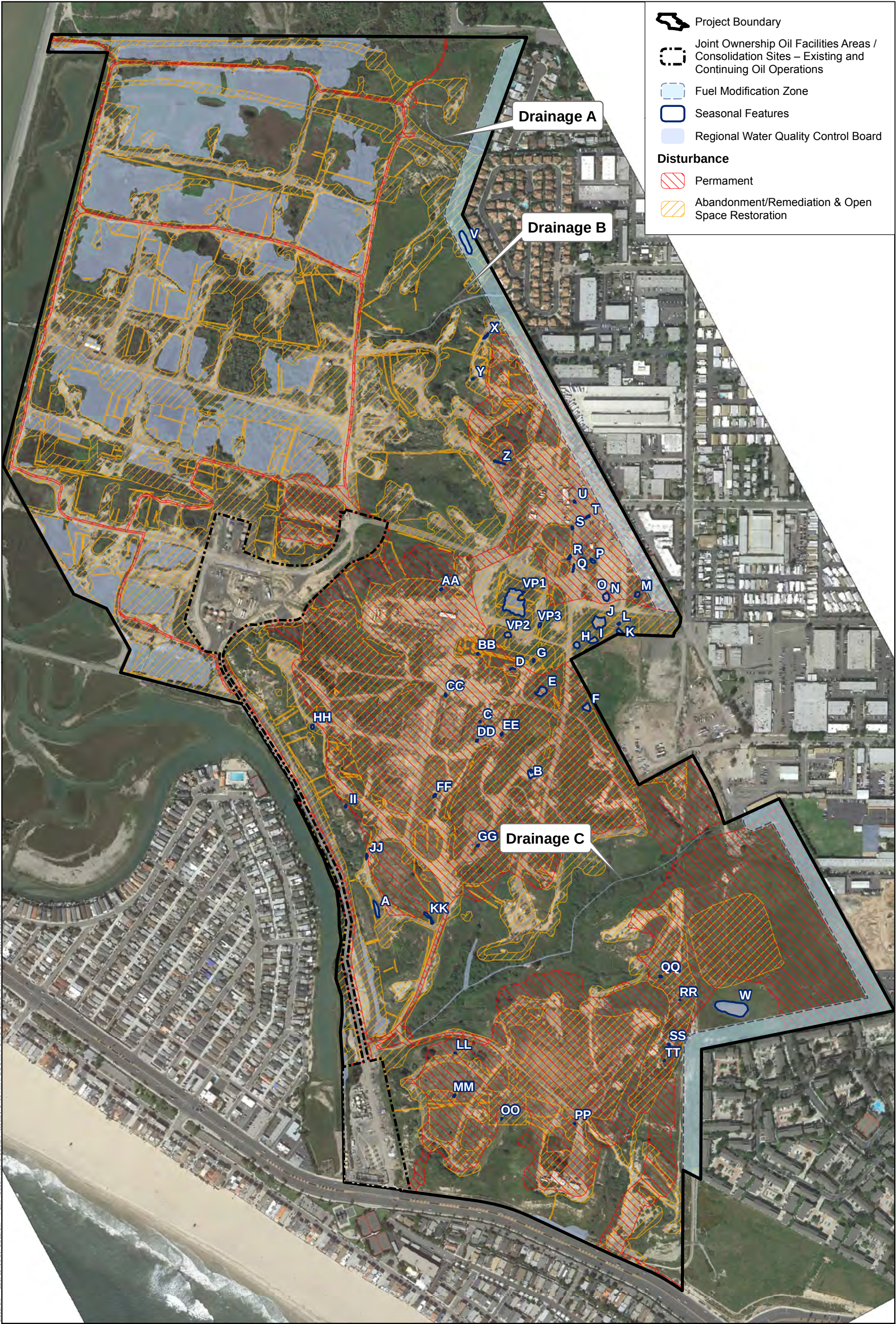
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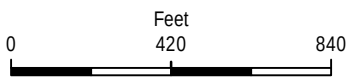
Habitat Conservation and Conceptual Mitigation Plan

Figure 4c
CCC Project Impacts

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1 inch = 504 feet

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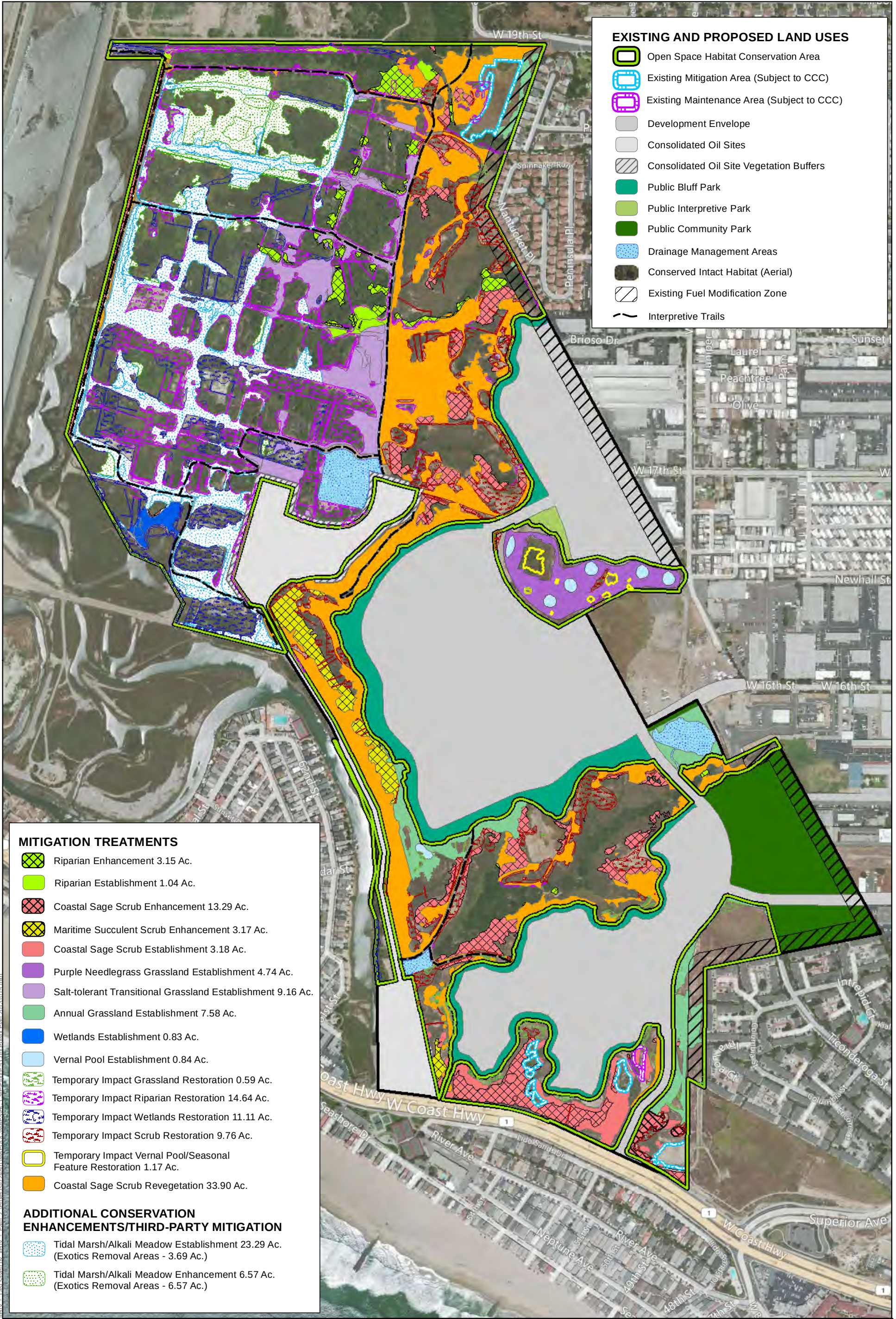
SOURCE: Jurisdiction Layers (GLA & Dudek), Project Footprint (Fuscoe Engineering), Abandonment/Remediation (Fuscoe Engineering & Dudek)

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Habitat Conservation and Conceptual Mitigation Plan

Figure 4d
RWQCB Project Impacts

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EXISTING AND PROPOSED LAND USES

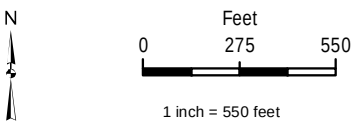
- Open Space Habitat Conservation Area
- Existing Mitigation Area (Subject to CCC)
- Existing Maintenance Area (Subject to CCC)
- Development Envelope
- Consolidated Oil Sites
- Consolidated Oil Site Vegetation Buffers
- Public Bluff Park
- Public Interpretive Park
- Public Community Park
- Drainage Management Areas
- Conserved Intact Habitat (Aerial)
- Existing Fuel Modification Zone
- Interpretive Trails

MITIGATION TREATMENTS

- Riparian Enhancement 3.15 Ac.
- Riparian Establishment 1.04 Ac.
- Coastal Sage Scrub Enhancement 13.29 Ac.
- Maritime Succulent Scrub Enhancement 3.17 Ac.
- Coastal Sage Scrub Establishment 3.18 Ac.
- Purple Needlegrass Grassland Establishment 4.74 Ac.
- Salt-tolerant Transitional Grassland Establishment 9.16 Ac.
- Annual Grassland Establishment 7.58 Ac.
- Wetlands Establishment 0.83 Ac.
- Vernal Pool Establishment 0.84 Ac.
- Temporary Impact Grassland Restoration 0.59 Ac.
- Temporary Impact Riparian Restoration 14.64 Ac.
- Temporary Impact Wetlands Restoration 11.11 Ac.
- Temporary Impact Scrub Restoration 9.76 Ac.
- Temporary Impact Vernal Pool/Seasonal Feature Restoration 1.17 Ac.
- Coastal Sage Scrub Revegetation 33.90 Ac.

ADDITIONAL CONSERVATION ENHANCEMENTS/THIRD-PARTY MITIGATION

- Tidal Marsh/Alkali Meadow Establishment 23.29 Ac. (Exotics Removal Areas - 3.69 Ac.)
- Tidal Marsh/Alkali Meadow Enhancement 6.57 Ac. (Exotics Removal Areas - 6.57 Ac.)



SOURCE: Aerial- BING MAPPING SERVICE

Figure 5
Conceptual Mitigation Plan

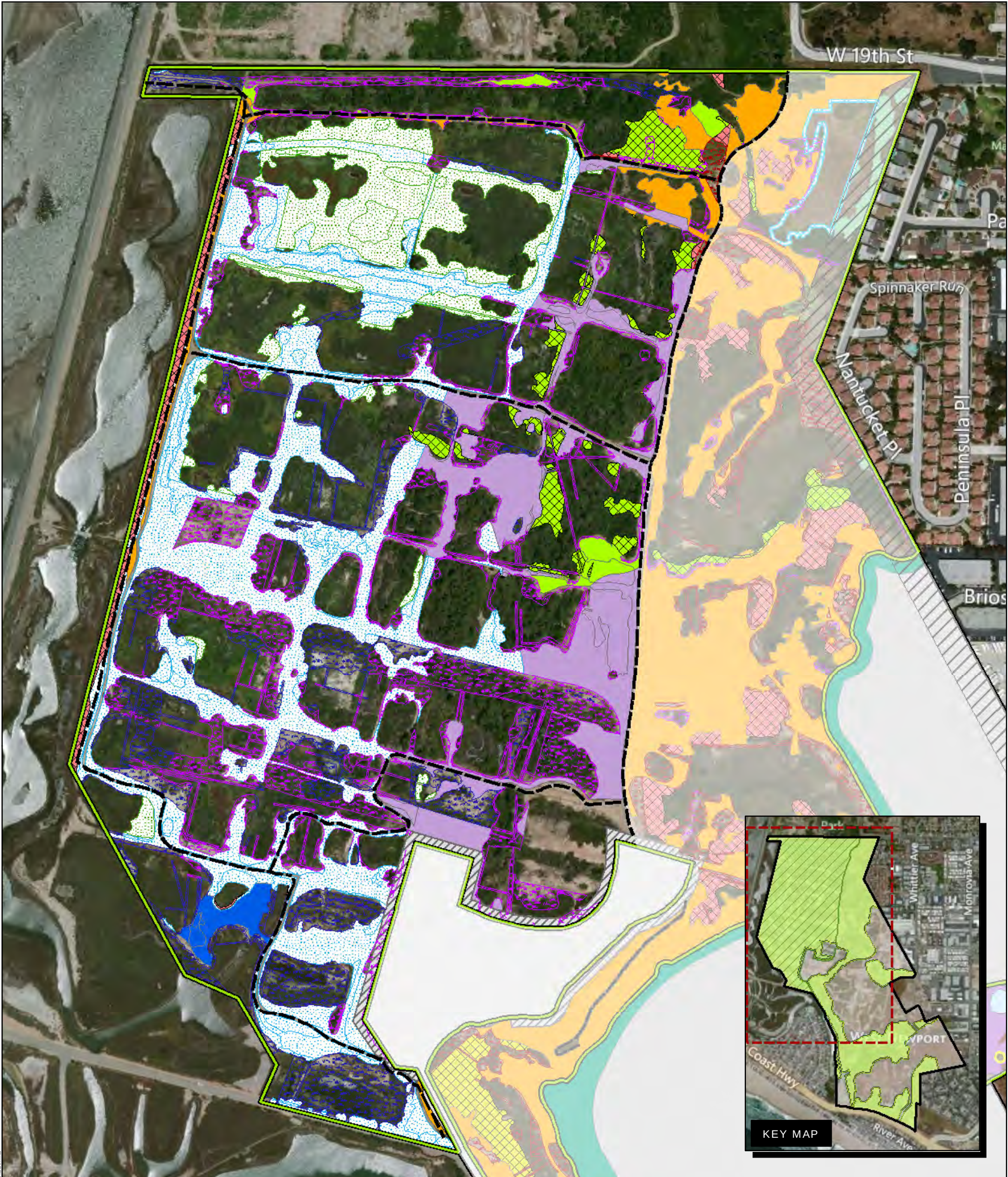
Habitat Conservation and Conceptual Mitigation Plan

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EXISTING AND PROPOSED LAND USES

- Open Space Habitat Conservation Area
- Existing Mitigation Area (Subject to CCC)
- Existing Maintenance Area (Subject to CCC)
- Development Envelop
- Consolidated Oil Sites
- Consolidated Oil Site Vegetation Buffers
- Public Bluff Park
- Public Interpretive Park
- Public Community Park
- Drainage Management Areas
- Conserved Intact Habitat (Aerial)

- Existing Fuel Modification Zone
- Interpretive Trails

MITIGATION TREATMENTS

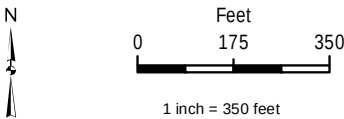
- Riparian Enhancement 3.15 Ac.
- Riparian Establishment 1.04 Ac.
- Scrub Enhancement 13.29 Ac.
- Maritime Succulent Scrub Enhancement 3.17 Ac.
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MITIGATION TREATMENTS

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- Temporary Impact Wetlands Restoration 11.11 Ac.
- Temporary Impact Scrub Restoration 9.76 Ac.
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- Tidal Marsh/Alkali Meadow Enhancement 6.57 Ac. (Exotics Removal Areas - 6.57 Ac.)



SOURCE: Aerial- BING MAPPING SERVICE

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NEWPORT BANNING RANCH

Figure 6a
Lowlands - Conceptual Mitigation Plan

Habitat Conservation and Conceptual Mitigation Plan

Date: 10/16/2013 - Created by: jerry - Last saved by: jerry - Path: Z:\Projects\1724801\MAPDOC\MAPS\HUC_CMI\Figure 6a Lowlands.mxd

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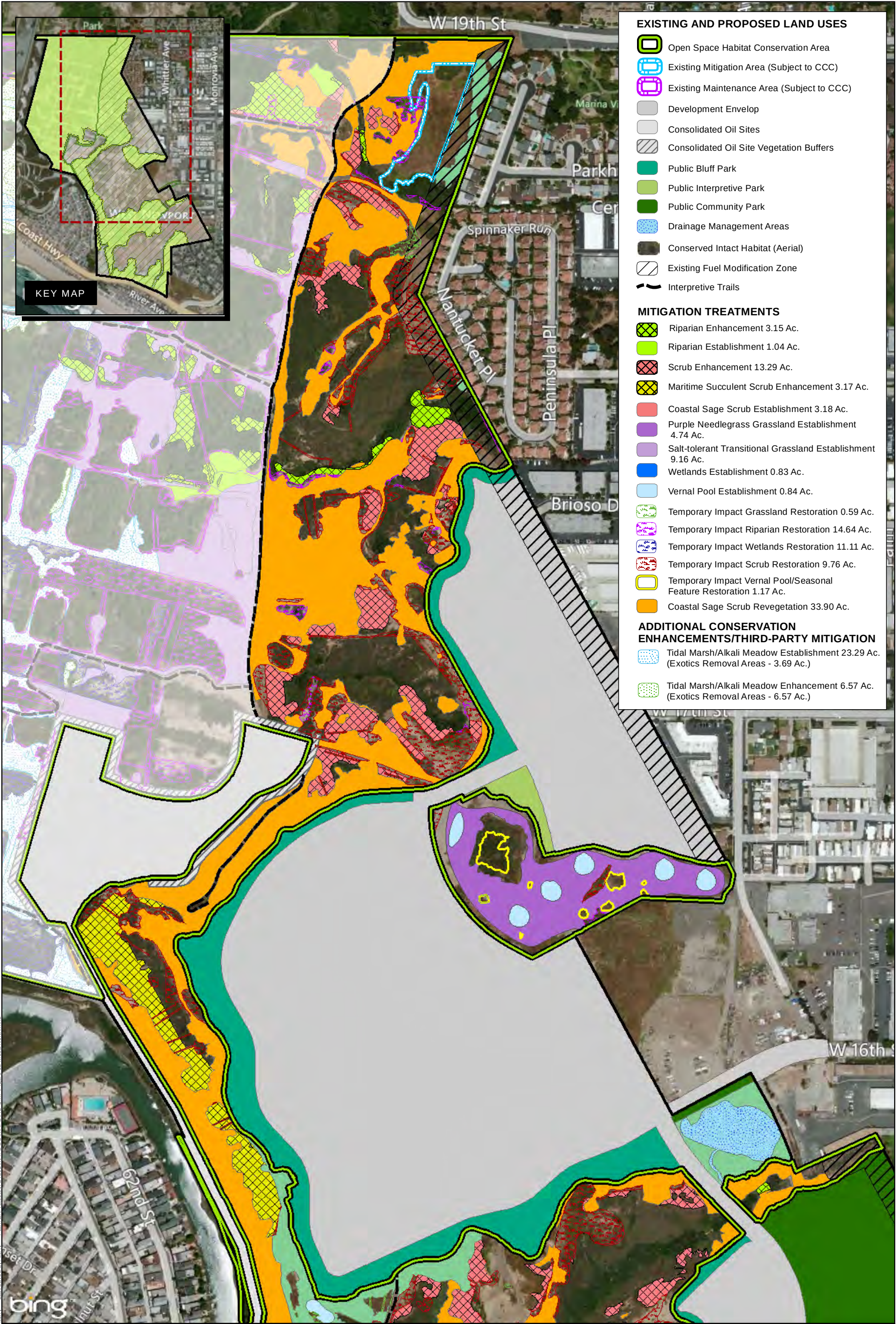


Figure 6b
Mesa (North) - Conceptual Mitigation Plan

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- EXISTING AND PROPOSED LAND USES**
- Open Space Habitat Conservation Area
 - Existing Mitigation Area (Subject to CCC)
 - Existing Maintenance Area (Subject to CCC)
 - Development Envelop
 - Consolidated Oil Sites
 - Consolidated Oil Site Vegetation Buffers
 - Public Bluff Park
 - Public Interpretive Park
 - Public Community Park
 - Drainage Management Areas
 - Conserved Intact Habitat (Aerial)
 - Existing Fuel Modification Zone
 - Interpretive Trails
- MITIGATION TREATMENTS**
- Riparian Enhancement 3.15 Ac.
 - Riparian Establishment 1.04 Ac.
 - Scrub Enhancement 13.29 Ac.
 - Maritime Succulent Scrub Enhancement 3.17 Ac.
 - Coastal Sage Scrub Establishment 3.18 Ac.
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 - Salt-tolerant Transitional Grassland Establishment 9.16 Ac.
 - Wetlands Establishment 0.83 Ac.
 - Vernal Pool Establishment 0.84 Ac.
 - Temporary Impact Grassland Restoration 0.59 Ac.
 - Temporary Impact Riparian Restoration 14.64 Ac.
 - Temporary Impact Wetlands Restoration 11.11 Ac.
 - Temporary Impact Scrub Restoration 9.76 Ac.
 - Temporary Impact Vernal Pool/Seasonal Feature Restoration 1.17 Ac.
 - Coastal Sage Scrub Revegetation 33.90 Ac.
- ADDITIONAL CONSERVATION ENHANCEMENTS/THIRD-PARTY MITIGATION**
- Tidal Marsh/Alkali Meadow Establishment 23.29 Ac. (Exotics Removal Areas - 3.69 Ac.)
 - Tidal Marsh/Alkali Meadow Enhancement 6.57 Ac. (Exotics Removal Areas - 6.57 Ac.)

Figure 6c

Mesa (South) - Conceptual Mitigation Plan

Habitat Conservation and Conceptual Mitigation Plan

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

3.2.2 Lowland Areas

The lowland portions of the site include areas that historically consisted of tidally influenced coastal salt marsh at the mouth of the Santa Ana River. Low berms constructed in the 1920s limited tidal influence, such that currently only the southwest portion of the site and areas immediately off site receive tidal influences. The existing hydrologic functions and services of the NBR lowland areas, in its current configuration, includes limited conveyance of perennial tidal flow, as well as storm water flow during rainfall events. The site provides short term water storage, dispersal of flood flow conveyance, and limited pollutant and sediment deposition.

The southwest portion of the site supports some disturbed coastal salt marsh habitat, while the remaining portions of the lowland consist of scattered alkali meadow, brackish marsh, ruderal wetlands, southern willow riparian forest and mulefat scrub vegetation communities. In the southwestern portions of the lowlands, most areas support patches of native and/or non-native species that exhibit saline influences. The dominant species in the southwestern portion of the lowlands includes pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), mulefat, poison hemlock (*Conium maculatum*), five-hook bassia (*Bassia hyssopifolia*). In the northeastern portion of the lowlands, freshwater influences from Drainages A and B are observed. Dominant native species in the northeastern portion of the site include mulefat, black willow, and arroyo willow. Dominant non-native species include pampas grass, poison hemlock, cocklebur, and bristly ox-tongue (*Picris echioides*).

3.2.3 CRAM Analysis of Functions and Services

A wetland functional assessment for the proposed riparian and wetland mitigation sites using the most recent version of the California Rapid Assessment Method for Wetlands, version 6.1 (Collins et al. 2013) will be conducted prior to the onset of Project impacts and oil remediation temporary impacts. The purpose of the CRAM is to evaluate the existing aquatic functions and services within the project area so that a comparison can be made to aquatic functions and services after implementation of the proposed Project and Mitigation Project. A second CRAM will be performed in the fifth year of the long-term mitigation and monitoring period, which will be compared to the initial CRAM results. A description of this performance standard is described in Section 3.7.1.

CRAM Background

CRAM was designed as a scientifically defensible and repeatable assessment methodology that could be used routinely to assess and monitor the condition of wetlands and riparian habitats. CRAM was developed through collaborations among the San Francisco Estuary Institute, the

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Southern California Coastal Water Research Project, the Central Coast District of the California Coastal Commission, and the Moss Landing Marine Laboratory.

CRAM provides a means of assessing wetland conditions based on field observations that correlate to quantitative measures of wetland function, condition, or beneficial use that vary predictably along gradients of environmental stress. Stressors such as habitat conversion, biological invasion, hydro-modification, and pollution are anthropogenic causes of changes in wetland function.

CRAM scores are based on best-fit narrative descriptions of habitat condition among a standardized set of mutually exclusive descriptions. Each wetland class has a particular set of narrative descriptions that allow comparison of CRAM scores within a wetland class, but not between classes for local, regional, and statewide monitoring purposes. CRAM attributes and metrics are presented in Table 6. Specific details about the individual attributes and metrics and the methodology used to conduct the CRAM analysis can be found in the *California Rapid Assessment Method for Wetlands*, version 6.1 (Collins et al. 2013) for Riverine and Estuarine areas.

Table 6
CRAM Attributes and Metrics

Attributes		Metrics	
Buffer and Landscape Context		Landscape Connectivity	
		Buffer	Submetric A: Percent of AA with Buffer
			Submetric B: Average Buffer Width
			Submetric C: Buffer Condition
Hydrology		Water Source	
		Hydroperiod or Channel Stability	
		Hydrologic Connectivity	
Structure	Physical	Structural Patch Richness	
		Topographic Complexity	
	Biotic	Plant Community	Submetric A: Number of Plant Layers Present or Native Species Richness (vernal pools only)
			Submetric B: Number of Co-dominant Species
			Submetric C: Percent Invasion
		Horizontal Interspersion and Zonation	
		Vertical Biotic Structure	

Source: Collins et al. 2013.

Note: AA = assessment area

Each metric and submetric is initially given a letter score A through D. The letter scores are converted to numerical scores upon completion of the CRAM assessment, and metric and

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

submetric scores are combined to create the four attribute scores. The total attribute scores are calculated by dividing the raw attribute score (the sum of each metric and/or submetric within an attribute) by its maximum possible raw score. Each final attribute score has a potential maximum value of 1.00 and a minimum value of 0.25. The overall CRAM score for each assessment area (AA) is calculated by averaging the four final attribute scores. The total overall CRAM score can range from 0.25 to 1.00.

3.3 Site Selection

Dudek conducted a comprehensive search of the potential riparian and wetland mitigation areas within the NBR property boundaries. The site search was done in accordance with the requirements listed in 33 CFR 332.3(b), which states that the mitigation site should be in the same watershed and where it is most likely to successfully replace the functions and services being lost. The process yielded multiple locations for riparian and wetland establishment, enhancement, and restoration.

Based on the site search, establishment, enhancement and restoration will occur primarily in the drainages adjoining the lowland areas, where oil remediation still needs to occur in order for mitigation to be implemented. In these areas, the conditions were evaluated based on the existing conditions as well as oil remediation plans (Geosyntec 2009). Of the sites considered, the drainages connecting to the lowland areas provide the most ideal location because mitigation can be conducted for all the Permitting Agencies concurrently at the same location. Exotic species, such as giant reed and pampas grass, currently exist in Drainages A, B, and C, which negatively affect hydrology, habitat diversity, and wildlife habitat. Enhancement efforts were concentrated in these Drainages. Additional proposed enhancement is also ideal in Drainage B, which will connect to establishment areas further downstream, restoring the overall functions and services of the drainage. Additionally, the drainages connecting to the lowland areas are of adequate size, with a significant hydrologic connection to support the various types of mitigation and in the amount of riparian and wetland resources required by the Project. What's more, the lowlands are adjacent to additional mitigation and preservation areas, which will provide additional habitat connectivity for native flora and fauna.

3.3.1 Methods

On May 29, 2013, Dudek habitat restoration specialist Jayme Timberlake conducted field surveys to identify potential mitigation sites within the NBR project area. Dudek prepared field maps with the following information: vegetation communities; special-status plant and wildlife species; 5-foot topographic data; full-color digital aerial photography; and the jurisdictional wetlands delineation data. Areas supporting special-status plant species were not considered

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

suitable for riparian and wetlands mitigation in order to avoid direct and indirect impacts to these resources (Figure 7). Areas where existing undisturbed native vegetation were not considered for mitigation. The stream channel and reach designations identified in the jurisdictional wetlands delineation for the Project were referenced while conducting the mitigation assessment (Dudek 2013; GLA 2008). Dudek assessed locations that would be suitable for riparian enhancement and establishment, and wetlands establishment.

3.3.2 Establishment and Enhancement Suitability Factors

Areas identified as having potential for establishment (i.e., creation) and enhancement were evaluated based on a set of factors important to the success of the Mitigation Project. The factors evaluated to determine suitability included the following:

1. **Hydrology** and hydrologic connections were evaluated by Dudek based on a number of factors, including location in the watershed, presence and/or persistence of surface water, source of water, and the amount of surface water. Based on field observations, it was determined that potential sites exhibiting presence and/or a persistence of surface water, a natural water source, and a greater quantity of surface water were considered to have greater restoration potential than those without such attributes.
2. **Soil conditions** were evaluated based on the type of soils present at each potential mitigation site and soil characteristics, including erosive potential, permeability, and water holding capacity (USDA 2013; Dudek 2013). Soils with lower erosion potential, greater water-holding capacity, higher presence of organic matter, and less soil disturbance were considered most suitable for mitigation.
3. **Existing vegetation** communities were evaluated based on the vegetation communities present at each potential mitigation site. Factors considered included each community's age and structural heterogeneity, including canopy development; the presence of non-native, invasive plants; and riparian corridor connectivity. Potential mitigation sites adjacent to stream channels with intact, native wetland vegetation; diverse age and structural heterogeneity; a well-developed tree canopy; lack of non-native, invasive plants; and the presence of a riparian corridor were ranked higher than areas without these attributes.
4. **Habitat connectivity** was evaluated to determine the extent of connectivity with adjacent transitional upland habitats. Sites with native vegetated buffers that would be less affected by adjacent disturbed areas, such as roadways or development, were ranked higher than those with degraded, non-native buffers. This was especially important in the assessment given that several special-status avian bird species, such as the least Bell's vireo (*Vireo bellii pusillus*) and Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), are known to forage on site.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

5. **Stream bank** stability was evaluated by conducting a general assessment of channel morphology and stream bank erosion in the field. Areas with stream banks that exhibited multiple terraces, gentle angles on the bank cuts, and more stable bank soils were considered more suitable locations for mitigation than those without terraces, with steep bank cuts, and with unstable bank soils.
6. **Construction/maintenance access** to the mitigation area was evaluated to determine if construction and/or maintenance access would be feasible. Sites that are adjacent to or that could be easily accessed from existing roads were considered to be more suitable mitigation locations than sites that would be less accessible.
7. **Potential grading requirements** were considered at each site. The amount of grading (depth and surface area) that would be required to construct potential mitigation sites was evaluated at each location. Potential sites where minimal grading would be required were more highly ranked than those that would require significant grading.
8. **Planting and irrigation requirements** were evaluated along each reach assessed in the analysis. Potential sites with access to an irrigation source were ranked higher than those without comparable irrigation options.
9. **Potential mitigation benefits** were evaluated to determine the acreage and extent of mitigation that could be achieved at that location. Sites where a greater amount of potential mitigation benefits could be achieved and hence minimize edge effects were ranked higher than sites that would result in fewer benefits.
10. **Long-term management considerations**, including the degree to which a site would be self-sustaining, the potential occurrence of non-native invasive plant species, future access constraints, and potential flood issues, were evaluated for each potential mitigation site. Sites that would be self-sustaining; have less potential for the reoccurrence of non-native invasive plant species; provide long-term access; and be less prone to adverse flood effects, were considered to be more suitable for mitigation.

3.4 Functions and Services of Mitigation Sites and Rationale for Expecting Success

A majority of the enhancement, establishment, and restoration of temporary impact areas will occur in the drainages connecting to the lowland areas of the site (Figures 5 and 6a–c). The location, size, and topography of the Project’s lowland areas are poised to become the future centerpiece of the long-envisioned 1,000-acre Orange Coast River Park. This regionally significant park concept is planned to extend inland from the mouth of the Santa Ana River to include properties in Costa Mesa and Newport Beach, and to spread northerly up the coast to wetland areas in Huntington Beach. With the oil remediation activities in the lowland areas and implementation of the Mitigation Project and Third-party Mitigation, the lowland areas will

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

contribute improved functions and services. These improvements will have a larger, more profound effect on the overall watershed given the connection to the ocean interface.

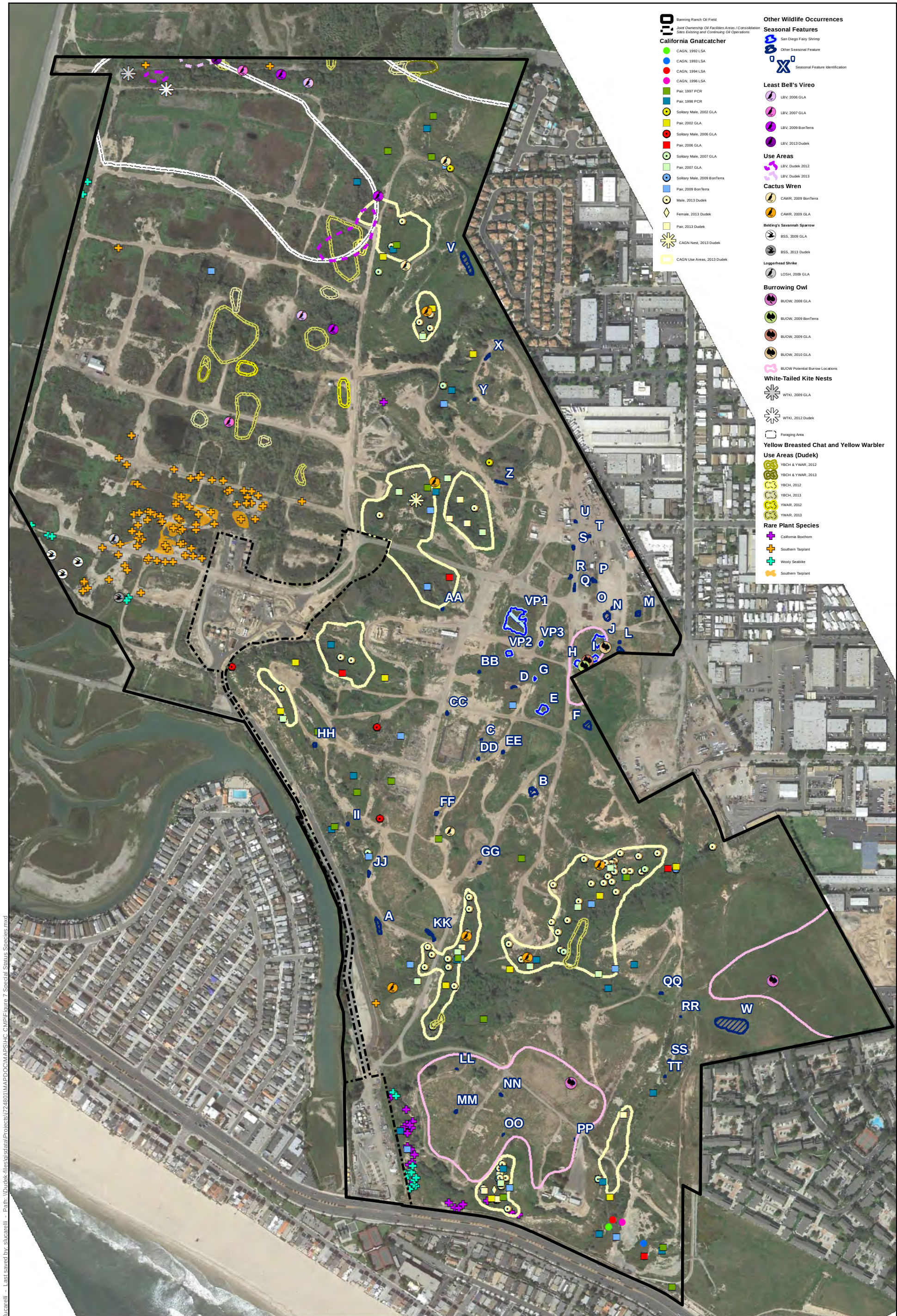
Areas to be Enhanced

Enhancement of southern willow scrub and mulefat communities in Drainages A, B, and C is proposed to occur. These areas have enhancement potential due to the presence of noxious, exotic species that will be removed and replaced with appropriate native vegetation communities. Surrounding existing native vegetation communities will assist with revegetation through native recruitment. Southern willow scrub in each of these Drainages is mature and established, with vegetation in the canopy, scrub and understory layers.

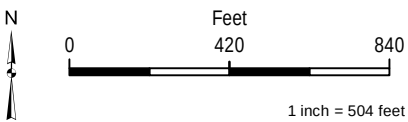
Additionally, Drainages A, B, and C are proposed for enhancement due to the potential improvements to habitat connectivity to existing riparian resources and adjacent transitional upland habitats. All three drainages support mature coastal sage scrub habitat in the adjacent upland areas. Some of this scrub habitat is also proposed for enhancement for mitigation for scrub impacts (see Section 5.0). Drainages A and B are ideal for enhancement because they exist well outside of the proposed Project area (adjacent to the lowlands) and will therefore be less affected by adjacent Project activities. Performing enhancement in Drainages A and B will improve the overall habitat connectivity which will serve to improve the functions and services that the drainages currently provide to wildlife species. This improvement to the functions and services of the drainages is especially important given that several special-status avian bird species, such as the least Bell's vireo, Belding's savannah sparrow, yellow warbler (*Dendroica petechia*) and yellow-breasted chat (*Icteria virens*), are known to forage on site and in adjacent lowland areas (Figure 7). In addition, enhancements in Drainage A, B and C will provide improved habitat for a variety of common riparian-dependent avian species such as the red winged black bird (*Agelaius phoeniceus*) and the common yellow throat (*Geothlypis trichas*). Improved riparian structure in Drainages A and B will also provide additional nesting habitat for raptors such as Cooper's hawk (*Accipiter cooperi*), which have often been observed nesting in riparian habitat in the lowlands.

Areas to be Established

Establishment in the lowland areas will occur in areas that are currently upland ruderal, disturbed, or developed habitat. The proposed establishment will convert these degraded upland areas to riparian corridors, resulting in a gain in aquatic resource area and function. Areas for riparian and wetland establishment were carefully evaluated. The areas that were selected for establishment maintained hydrologic connections which were evidenced by the presence and/or persistence of surface water and/or a predictable source of water.



Date: 9/10/2013 - Created by: slucarelli - Path: \\Dudek-files\gis\data\Projects\172401\MAP\DOC\MA\PS\HC C\MP\Figure 7 Special Status Species.mxd



DUDEK

SOURCE: Aerial provided by Fusco Engineering; Biological data from BonTerra, GLA, LSA, PCR and Dudek; Vegetation Dudek (2013)

NEWPORT BANNING RANCH

Figure 7
Special Status Species and Plants
Habitat Conservation and Conceptual Mitigation Plan

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Riparian establishment is currently proposed in upland areas adjacent to Drainages A and B, which connect to the lowlands. Riparian establishment in the northern portions of the lowlands will increase hydrologic connectivity on site between disjointed jurisdictional habitats. Currently, the lowland jurisdictional riparian areas are disconnected from one another due to the presence of elevated areas and dirt roads that historically connected oil facilities. Functions and services improvements will result from removing fill in these developed areas and reconnecting existing riparian resources. Functions and services to be improved include increased wetland vegetation in the flood plain areas and nutrient cycling. Improvements downstream to water quality are expected due to additional channel bottom area that will help trap sediment and toxins. Additionally, habitat values will be increased with a more intact vegetated channel than previously existed and will provide increased cover and foraging opportunities for wildlife. Increased trees and wooded areas in the form of additional southern willow scrub habitat have the potential to provide nesting habitat for raptors and foraging habitat for species such as Cooper's hawk, osprey (*Pandion haliaetus*) and red-shouldered hawk (*Buteo lineatus*).

Wetland establishment is proposed in the southern portion of the lowland area, adjacent to the approximate 29.9 net acre third-party mitigation area that will allow for additional opportunities for wetland habitat establishment, restoration and/or enhancement located contiguous with the USACE-restored salt marsh basin along the Santa Ana River. This area is proposed for salt marsh establishment because it is tidally influenced, as evidenced by the presence of saline water and salt marsh fauna. Grading existing roads in this area will greatly improve the connectivity between the tidal interface and the alkali meadows that currently exist east of the proposed salt marsh establishment area. The increased tidal marsh area connecting with existing and established alkali meadow will improve the overall functions and services on site. The potential for increased retention of water on site and improved overall flood flow conveyance should enhance the overall wetland site conditions and provide increased habitat for wetland plant and wildlife species. Establishment efforts in the lowland areas will increase biological productivity of the preserved open space and provide enhanced habitat for wildlife in the lowland salt marsh and alkali meadow habitats. Restoration of alkali meadow in the lowland will provide foraging habitat for a suite of raptors, including white-tailed kite (*Elanus leucurus*), Cooper's hawk, red-tailed hawk, northern harrier (*Circus cyaneus*), Loggerhead shrike (*Lanius ludovicianus*), long-eared owl (*Asio otus*), American kestrel (*Falco sparverius*), ferruginous hawk (*Buteo regalis*), American peregrine falcon (*Falco peregrinus anatum*), and merlin (*Falco columbarius*). In addition, the lowland alkali meadow will provide nesting and foraging habitat for short-eared owl (*Asio flammeus*). Suitable habitat for short-eared owl has become rare in Orange County; thus, the proposed restoration of alkali meadow habitat in the lowlands represents a significantly important mitigation measure for the owl in Orange County.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Areas to be Restored

Areas that will be temporarily disturbed in the lowland area will be restored to conditions of a higher quality than they are currently. Currently, native habitats do exist within temporary impact areas, however, they are disjointed and monotypic with very limited biological diversity. A majority of the temporary impacts will occur in ruderal wetlands, which consist of patches of non-native and/or weedy species such as poison hemlock (*Conium maculatum*) with local dominance by five-hook bassia (*Bassia hyssopifolia*), Spanish sunflower (*Pulicaria paludosa*), and giant horseweed (*Conyza canadensis*) in limited areas. In temporary disturbance areas where elevations are too high to convey tidal influence and or support alkali meadow species, those areas will be restored to a grade that is lower and more appropriate for salt marsh habitat.

Existing functions and services will be improved by the restoration of these areas that will be temporarily impacted. The tidal influence will be extended due to the removal of oil facilities and the subsequent replacement of appropriate native species that will not hinder tidal influence. Pollutant and sediment deposition and flood conveyance will be improved once restoration occurs because appropriate species in the salt marsh and alkali meadow habitats will allow for enhanced percolation to the groundwater. Biodiversity will also be improved with the completion of restoration activities because the temporary impacts areas will be vegetated with native species, replacing ruderal, disturbed, or monotypic vegetation communities with those more appropriate to the context and goals of the native vegetation community. Planting palettes, provided in Section 3.6, will create a diverse assemblage of native species that will replace and increase the functions and services of the impacted vegetation communities.

3.5 Proposed Site Preparation

This section describes the mitigation pre-construction process that is intended to achieve the target acreages for riparian and wetland mitigation. In general, the preparation for construction of mitigation will include the following activities:

- Establish project limits using temporary fence to protect adjacent sensitive resources
- Site preparation including the removal of all non-native vegetation
- Soil preparation and weed control (as needed), including grow and kill treatment if deemed necessary
- Salvage and/or collection of cuttings from Project site
- Grading and re-contouring riparian and wetland establishment areas
- Installation of a temporary irrigation system

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

3.5.1 Site Access

Public access will be provided adjacent to the mitigation sites via public trails that wind through the lowlands. Ingress and egress to the trails will be controlled during the construction and initial maintenance and monitoring period of the mitigation areas and posted with signage indicating the presence of sensitive resource areas.

Orange construction fencing and erosion control silt fence will identify the limits of restoration. This orange fencing will remain in place and be maintained by the Restoration Contractor through Years One – Three. If the construction fencing is damaged by storm flows, replacement based on the Project Biologist's discretion will be recommended.

3.5.2 Existing Resource Impact Avoidance

If initial site vegetation clearing is unavoidable in the lowland temporary disturbance areas during the nesting bird season (March 1–September 30), the Project Biologist will conduct pre-construction surveys no earlier than 7 days prior to ground-disturbing activities that occur during the nesting/breeding season of special-status bird species potentially nesting on the site. The project biologist will be qualified to conduct all avian surveys. For nesting riparian birds, the project biologist will be qualified and permitted to conduct surveys for willow flycatcher and least Bell's vireo. The pre-construction surveys will be conducted between March and September or as determined by the Project Biologist, depending on the location of the ground-disturbing activities. The purpose of the surveys will be to determine if active nests of special-status birds are present in the disturbance zone or within 150 feet of the disturbance zone boundary. If active nests are found, ground-disturbing activities within 150 feet of the nest (or 300 feet for most raptors and tricolored blackbird colonies) will be postponed or halted, at the discretion of the Project Biologist, until the nest is vacated and juveniles have fledged, as determined by the Project Biologist. If ground-disturbing activities are delayed, then additional pre-disturbance surveys will be conducted such that no more than 7 days elapse between the survey and ground-disturbing activities. Limits of construction to avoid an active nest shall be established in the field with flagging, fencing, or other appropriate barriers, and construction personnel will be instructed on the sensitivity of nest areas. The Project Biologist will serve as a construction monitor during those periods when construction activities are to occur near active nest areas to avoid inadvertent impacts to these nests. The Project Biologist may adjust the 150 or 300-foot setback at his or her discretion depending on the species and the location of the nest (e.g., if the nest is well protected on a rocky outcrop or buffered by dense vegetation).

3.5.3 Grading and Construction Documents

The proposed Mitigation Project will require grading and contouring to create appropriate hydrologic conditions for the establishment of the target vegetation communities and to restore temporary disturbance areas to elevations appropriate for restoration. The grading work will result

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

in greater topographic heterogeneity than what is currently present in the lowland areas. In wetland establishment areas, grading to elevations just above the water table will occur to permit planting of salt marsh species and allow for tidal influence. In riparian areas, swales and channels will be formed with primary and secondary benches to establish proposed vegetation communities.

Once oil remediation removal activities are complete, soil samples will be collected from the lowland mitigation areas and analyzed for their chemical makeup. Test results will be used to determine if additional soil amendments are needed to improve the soils for appropriate native plant growth and establishment.

Following approval of this HCCMP, construction drawings and specifications will be prepared for construction of the Mitigation Project. Construction drawings and specifications will conform to all aspects of this HCCMP and permit conditions required by the Permitting Agencies. Construction documents will incorporate the most current site condition information available. Any significant changes to site conditions and final mitigation plans may be subject to review and comment by Permitting Agencies. The plan package will include a site plan showing proposed work areas and final site facilities, grading, construction details, irrigation, and planting plans.

As-built plans for the mitigation areas will only be required if the installation substantially deviates from this HCCMP and/or the permit conditions.

3.5.4 Initial Non-Native Invasive Plant Removal

Non-native invasive plant removal is a critical element of the HCCMP, and particularly the initial phases. Large patches of the proposed enhancement and establishment areas are infested with invasive non-native species, including giant reed, ice plant, and pampas grass.

Riparian mitigation in Drainages A, B, and C will involve removal of non-native vegetation, limited grading to reestablish appropriate channel morphology where needed, followed by plant and seed installation. Site preparation may include the use of heavy equipment to remove the areas of dense woody non-native invasive species, followed by grading to establish an appropriate low-flow channel, terraces, and positive drainage to the lowlands (especially in Drainage B).

In the lowland areas, oil remediation and subsequent grading will result in the initial removal of invasive species. Propagules of non-native species are likely to remain on site as a seed bank or root fragments. Therefore, tidal marsh and alkali meadow mitigation areas may require implementation of a grow-and-kill program to remove the monocultural stands of poison hemlock, ice plant, five-hook bassia, and other non-native species. Heavy equipment may be used to remove non-native trees such as myoporum. Restoration of the target habitat types will be implemented during the appropriate planting period in advance of or concurrently with grading of the establishment areas.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Weed control and removal work shall be performed in compliance with all applicable federal and state laws and regulations, safety precautions, and pesticide label directions. The Restoration Contractor shall possess a valid California Qualified Applicator Certificate or Qualified Applicator License, and Pest Control Business License or Maintenance Gardener Pest Control Business License, as appropriate for the situation.

The Restoration Contractor shall refer to the specific pesticide label for information on proper timing, application rates, and any use restrictions. The Restoration Contractor must follow all applicable label directions, laws, regulations, and safety precautions when performing weed control. Should the Restoration Contractor require a specific weed control recommendation for any control effort, he or she shall consult a licensed pest control adviser for a written recommendation.

3.5.5 Salvage and/or Collection of Native Species On Site

Cuttings will be harvested from existing mulefat and southern willow scrub areas within the NBR project area, and installed after appropriate preparation.

Harvesting methods will include:

- Harvesting live branches at the most dormant period feasible, i.e. while in a deciduous state;
- Selecting healthy, live, reasonably straight wood during harvest procedures;
- Collecting cuttings that are 0.75–1.5 inches in diameter and at least 36 inches long;
- Cutting stake butt ends cleanly and at a 45 degree angle without splits and splinters; and
- Removing all lower branches and leaves from the stake to increase the surface area available for rooting, minimize transpiration and drying, and to facilitate efficient installation.
- Pre-treating cuttings by soaking in water for 2-3 days until installation. Cuttings soaked longer than 3 days shall be discarded.

3.5.6 Erosion Control and Best Management Practices

Mature vegetation characterizes Drainages A, B and C, where enhancement is proposed, therefore extensive erosion is not expected to occur during mitigation installation activities. However, silt fences, fiber rolls, and construction fencing may be incorporated into the best management practices (BMPs) based on the construction documents and/or Project Biologist's recommendation.

To minimize the potential for loss of soils and vegetation from the establishment and enhancement areas, plant installation should start in the early spring after the likelihood of significant storm events has decreased. This will allow for an establishment period before the next fall rainy season. Given the interface of the wetland establishment areas in the southern lowland areas with the existing off-site tidal marsh habitat, grading and implementation of the Mitigation Project should

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

be minimized during the rainy season, if possible. In areas where temporary impacts will be restored in place, a similar stringent timing approach should also be taken.

3.6 Plant Installation for Riparian and Wetland Areas

Riparian and wetland vegetation and will be established within the candidate mitigation areas, as depicted in Figures 5–6c.

The plants selected for the plant palettes (Table 7–10) below were based on surveys conducted during various biological survey visits, including vegetation mapping (GLA 2009), jurisdictional delineation (GLA 2008), and subsequent site visits to further evaluate the mitigation and restoration sites for suitability. The riparian habitat components are conducive for supporting the least Bell's vireo. The lowland alkali meadow components are conducive for supporting a variety of foraging raptors and potentially the Belding's Savannah sparrow. No planting shall be done in any area until the area concerned has been prepared in accordance with the HCCMP and approved by the Project Biologist.

3.6.1 Recommended Plant Palettes for Establishment, Enhancement, and Restoration of Temporary Impact Areas

Table 7
Riparian Southern Willow Scrub Plant Palette for
Establishment, Enhancement and Restoration Areas

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Ambrosia psilostachya</i>	western ragweed	6	10
<i>Artemisia douglasiana</i>	mugwort	6	2
<i>Distichlis spicata</i>	salt grass	70	1
<i>Epilobium ciliatum</i>	willowherb	48	0.2
Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Frankenia salina</i>	alkali heath	4	4
<i>Heliotropium curassavicum</i>	salt heliotrope	12	4
<i>Isocoma menziesii</i>	coast goldenbush	15	4
<i>Iva hayesiana</i>	San Diego marsh-elder	20	4
<i>Juncus bufonius</i>	toad rush	60	0.2
<i>Malvella leprosa</i>	alkali sida	2	8
<i>Muhlenbergia rigens</i>	deerweed	60	0.5
<i>Pluchea odorata</i>	saltmarsh fleabane	15	0.5
<i>Verbena lasiostachys</i>	western verbena	2	2
Total Pounds per Acre			40.4

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 7
Riparian Southern Willow Scrub Plant Palette for
Establishment, Enhancement and Restoration Areas

Botanical Name	Common Name	Container Plants	Average Spacing (feet on center)	Percent of Planted Area
<i>Baccharis salicifolia</i>	mulefat	1 gallon	5	15%
<i>Baccharis salicifolia</i>	mulefat	live cuttings	3	10%
<i>Clematis pauciflora</i>	rope-vine clematis	1	5	4%
<i>Leymus triticoides</i>	creeping wild rye	1 gallon	4	12%
<i>Populus fremontii</i>	Fremont cottonwood	1 gallon	20	5%
<i>Salix goodingii</i>	black willow	1 gallon	8	15%
<i>Salix lasiolepis</i>	arroyo willow	1 gallon	8	5%
<i>Salix lasiolepis</i>	arroyo willow	live cuttings	3	10%
<i>Sambucus mexicana</i>	Mexican elderberry	1 gallon	10	5%
<i>Pluchea sericea</i>	arrowweed	1 gallon	15	10%

Note: All hydroseed mixes shall include seed mix indicated in pounds per acre and virgin wood cellulose fiber mulch at 2,500 pounds per acre.

Table 8
Riparian Mulefat Scrub Plant Palette for Restoration Areas

Botanical Name	Common Name	Minimum PLS	Pounds per Acre	
<i>Ambrosia psilostachya</i>	western ragweed	6	10	
<i>Atriplex canescens</i>	fourwing saltbush	35	2	
<i>Artemisia douglasiana</i>	mugwort	6	6	
<i>Distichlis spicata</i>	salt grass	70	4	
<i>Heliotropium curassavicum</i>	salt heliotrope	12	4	
<i>Iva hayesiana</i>	San Diego marsh-elder	20	9	
Total Pounds per Acre			35	
Botanical Name	Common Name	Container Plants	Average Spacing (feet on center)	Percent of Planted Area
<i>Baccharis salicifolia</i>	mulefat	1 gallon	5	30%
<i>Baccharis salicifolia</i>	mulefat	live cuttings	3	50%
<i>Pluchea sericea</i>	arrowweed	1 gallon	15	20%

Note: All hydroseed mixes shall include seed mix indicated in pounds per acre and virgin wood cellulose fiber mulch at 2,500 pounds per acre.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 9
Wetland Salt Marsh Container Plant Palette for Establishment and Restoration Areas

Botanical Name	Common Name	Container Plants	Average Spacing (feet on center)	Percent of Planted Area
<i>Jaumea carnosa</i>	salty susan	1 gallon	6	10%
<i>Batis maritima</i>	saltwort	1 gallon	5	5%
<i>Distichlis spicata</i>	saltgrass	1 gallon	4	10%
<i>Frankenia salina</i>	alkali heath	1 gallon	5	15%
<i>Juncus acutus</i>	spiny rush	1 gallon	6	5%
<i>Limonium californicum</i>	San Diego rosemary	1 gallon	3	2%
<i>Salicornia subterminalis</i>	Parish's glasswort	1 gallon	4	20%
<i>Salicornia virginica</i>	pickleweed	1 gallon	4	20%
<i>Sueda californica</i>	sea blight	1 gallon	3	13%

Table 10
Wetland Alkali Meadow Container Plant Palette for Restoration Areas

Botanical Name	Common Name	Minimum PLS	Pounds per Acre	
<i>Cressa truxillensis</i>	alkali weed	7	3	
<i>Epilobium ciliatum</i>	willowherb	48	0.5	
<i>Heliotropium curassivicum</i>	seaside heliotrope	12	4	
<i>Pluchea odorata</i>	saltmarsh fleabane	15	1	
<i>Spergularia marina</i>	saltmarsh sand spurrey	20	1	
Total Pounds per Acre			9.5	
Botanical Name	Common Name	Container Plants	Average Spacing (feet on center)	Percent of Planted Areas
<i>Distichlis spicata</i>	saltgrass	plugs	2	35%
<i>Frankenia salina</i>	alkali heath	1 gallon	6	20%
<i>Juncus mexicanus</i>	Mexican rush	1 gallon	5	10%
<i>Leymus triticoides</i>	alkali rye	1 gallon	4	5%

3.6.2 Live Cutting, Container Plant, and Hydroseed Installation

Planting design and container plant layout shall be randomly patterned (as opposed to rows), to create a natural patchiness that is typical within the target plant community. The installation contractor shall lay out container plants, and the Project Biologist shall inspect the locations, and adjust placement, if necessary.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Live Cuttings

Cutting installation methods will include:

- Installing a minimum of 18 inches of the butt-end in the soil so that the soil surface is flush with remaining branches and tamping the soil around butt-end;
- Use 4 inch diameter auger to create plant hole depth, backfilling planting hole with amended backfill.
- Soaking all cuttings in water for a minimum of 24 hours prior to planting so that they do not dry out, unless cuttings may receive immediate and sufficient irrigation upon planting;
- Discarding cuttings with damaged buds, stripped bark, or splits and replacing them with undamaged stakes; and
- Planting stakes throughout the SWS mitigation site as directed by the Project Biologist.

Modifications to these methods will occur in consultation with the Project Biologist.

Container Plant Installation

Implementation of this HCCMP must be coordinated with the Restoration Contractor, City, and the Project Biologist. All container plants will be checked for viability and general health upon arrival at the mitigation site by the Project Biologist. Plant materials not meeting acceptable standards will be rejected. Plant species and quantities will be confirmed after delivery by the Project Biologist. Container plants shall be laid out by the contractor, and their placement verified and adjusted by the Project Biologist.

Standard planting procedures will be employed for installing container plants. Holes approximately twice the width of the rootball of the plant and the same depth will be dug using a post hole digger or power auger. Holes will be filled with water and allowed to drain immediately prior to planting. Backfill soil containing amendments (per formal soils analysis recommendations and as directed by the Project Biologist) will be placed in every planting hole following soaking, and container plants will be installed so that the root ball is entirely below grade.

Hydroseed Installation

Individual mixes have been prescribed for the different vegetation communities. Labels for each seed delivered to the site will be inspected and approved by the Project Biologist prior to mixing and application. All mixes are to include the specified seed mix at the prescribed rates per acre; virgin wood cellulose fiber mulch at 2,500 pounds per acre; commercial fertilizer at the specified

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

rate, as directed by the Project Biologist during finish grading; and a commercial binder (Az-Tac or equivalent) at 150 pounds per acre.

All seeds will be clearly labeled showing type of seed, test date, the name of the supplier, and percentage of the following: pure seed, crop seed, inert matter, weed seed, noxious weeds, and total germination content. All material will be delivered to the site in original, unopened containers bearing the manufacturer's guaranteed analysis. All seed mixes will be stored in a dark, cool place and not be allowed to become damp.

Installation between the months of October to January are ideal for allowing establishment during the cooler and wetter time of the year. If necessary, however, with the presence of a temporary above ground irrigation system, installation at any time of the year is possible.

While the initial seed application is proposed to consist of hydroseeding, additional seed may be hand broadcast, should the seed not be available at the time of initial hydroseed installation. The contractor should consult the Project Biologist in the event that a given species on the plant palette will not be available for inclusion into the initial hydroseed mix.

3.6.3 Irrigation System Installation/Operation

A temporary above ground spray irrigation system will be installed to support native vegetation development until plants are self-sustaining, based on observed and predicted seasonal rainfall and effective plant rooting depth. Germination and seedling establishment will also progress much more rapidly than if left to seasonal rainfall patterns within the first few growing seasons. Irrigation is proposed to be installed in the riparian establishment, enhancement, and restoration areas, and in the wetland restoration areas. No irrigation is proposed to be installed in the wetland establishment areas.

In addition, the irrigation system may be used for site preparation prior to plant and seed installation to induce germination of non-native species for "grow and kill" cycles. This may consist of running the irrigation regularly until germination of seeds within the soil's seed bank occurs. Once seedlings are big enough to be positively identified, they may be controlled. Appropriate native species which have germinated may be left in place. This cycle of grow and kill may be repeated until the non-native seed bank within the sites has reached a desirable level.

All irrigation will be installed by the installation contractor under direction of the Project Biologist. The irrigation system should be designed with above ground components to facilitate removal once the system is decommissioned. Water sources and points of connection shall be from on-site locations. The goal of the restoration project is to create native, self-sustaining plant communities. Ideally, irrigation use would be discontinued at least 2 years before the end of the

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

maintenance and monitoring period to demonstrate the vegetation communities' ability to survive without supplemental water.

The irrigation system would use programmable valves that would operate independent irrigation circuits, minimizing irrigation maintenance requirements for the site. All irrigation on site would consist of UV resistant polyvinyl chloride (UV-PVC) pipe staked at grade, with 100% coverage from spray heads.

The Project Biologist would consult with the client and the restoration contractor regarding the watering schedule during the monitoring period and the timing for the cessation of irrigation. Irrigation should stop at the earliest possible date without risking significant loss of plantings.

3.7 Final Performance Standards for Riparian and Wetland Areas

Performance standards have been established based upon expected vegetative development within a properly functioning native habitat of the same type, and are listed below in Tables 11 and 12. These vegetation community based performance standards will be utilized to assess the annual progress of the Mitigation Project, and are regarded as interim project objectives designed to achieve the final mitigation goals. Fulfillment of these standards will indicate that the mitigation area is progressing toward the long-term goals of the plan. If mitigation efforts fail to meet the performance standards listed in any one year, the Project Biologist will recommend remedial actions to be implemented (e.g., supplemental planting, seeding, transplanting) that will enhance the vegetation communities to a level in conformance with these standards.

At the end of the 120-day establishment period after installation, all native container plantings will achieve 100% survival, and hydroseed will show signs of germination. Weeds will make up no more than the specified percentage of the entire cover, and the site will be free of invasive exotic plant species, per the California Invasive Plant Inventory (CAL IPC 2013).

Performance standards for the establishment, enhancement, and restoration activities that occur in the southern willow scrub and mulefat scrub communities are shown in Table 11. Performance standards for the establishment and restoration activities that occur in the salt marsh and alkali meadow communities are shown in Table 12.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 11
Performance Standards for Mulefat and Southern Willow Scrub Riparian Habitats

Year	Percent Survival	Percent Native Cover	Maximum Percent Non-Native Cover*	Average Willow Height (feet)**
1	100	20	15	--
2	80	30	15	--
3	80	75	15	8
4	80	80	10	12
5	80	90	5	16

Percent Survival = total percentage survival of all container plants.

Percent Cover = total percent cover of all native plant species, including trees, shrubs, and herbs.

* Non-native annual species only; perennial invasive exotic species shall not contribute to vegetative cover on the mitigation sites.

**Willow heights will be taken only in southern willow scrub establishment, enhancement, and restoration areas.

Table 12
Performance Standards for Salt Marsh Wetlands and Alkali Meadows

Year	Percent Survival	Percent Native Cover	Maximum Percent Non-Native Cover*
1	100	20	10
2	90	30	10
3	90	40	10
4	90	60	8
5	90	90	5

Percent Survival = total percentage survival of all container plants.

Percent Cover = total percent cover of all native plant species, including trees, shrubs, and herbs.

* Non-native annual species only; perennial invasive exotic species shall not contribute to vegetative cover on the mitigation sites.

3.7.1 CRAM Performance Standards

In the fifth year of the mitigation installation, the functions and services of the vegetation communities to be established and enhanced will be assessed using a second CRAM analysis. A successful project will demonstrate an increasing trend in the average CRAM score from the initial baseline CRAM assessment.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

4.0 MITIGATION IMPLEMENTATION PLAN FOR SEASONAL FEATURES AND VERNAL POOLS

4.1 Goals of the Proposed Mitigation

The proposed Project creates permanent impacts to portions of vernal pools and seasonal wetland depression features found on the mesa, totaling 0.23 acres. Of these permanent impacts, Feature E, a documented oil field sump, supports USFWS designated San Diego fairy shrimp, which connotes a higher 4:1 mitigation to impact ratio. Permanent impacts to seasonal features that do not support San Diego fairy shrimp are mitigated at a 1:1 mitigation to impact ratio for a total of 0.179 acres of required mitigation. Temporary impacts are proposed to occur in 2 vernal pools known as VP1 and VP2, and 14 additional seasonal features. Temporary impacts to vernal pools and seasonal features supporting San Diego fairy shrimp total 0.471 acres and will be mitigated for at a higher 2:1 mitigation to impact ratio. Temporary impacts to seasonal features which do not support San Diego fairy shrimp will be mitigated in-place and in-kind at a 1:1 ratio (Table 13). Temporary impacts may be less than proposed and, subsequently, restoration acreages would be reduced accordingly.

Seasonal feature and vernal pool (collectively referred to as Pools) mitigation will consist of several components, including:

- The establishment of 0.846 acres of pool surface area in approximately 6 to 8 vernal pool features on the mesa;
- The enhancement of 0.28 acre of vernal pools through the removal non-native vegetation, native vegetation uncharacteristic of vernal pools, trash and debris, and sediment;
- The restoration of 16 vernal pools that will be temporarily impacted (totaling 0.6 acres); and
- The addition of native grassland habitat in the watershed surrounding the established/enhanced pools, known herein as the vernal pool complexes.

To mitigate for Project impacts to the Pools, a vernal pool complex on the eastern portion of the Project site will be created and preserved through the enhancement of an existing vernal pool by removal of non-native species and native plants (that are not characteristic vernal pool species) and oil facilities, pipes, etc., and through the establishment of 6 to 8 additional vernal pools. The vernal pool complex will sustain buffer areas around the established and enhanced vernal pools through the establishment of purple needlegrass habitat in areas that are currently ruderal or disturbed. An additional vernal pool complex featuring one established pool will be constructed to the southwest, in an area which currently supports two seasonal features

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

(Features A and II) that will be preserved in place. In addition, an additional seasonal feature (Feature W) located on the southeast portion of the site will be protected within the Natural Open Space Preserve at the request of Permitting Agencies. The established and preserved Pools in the southwest vernal pool complex and preserved seasonal Feature W will also be surrounded with an annual grassland buffer.

4.1.1 Target Acreages for Mitigation

Table 13
Summary of Proposed Mitigation by Impact and Mitigation Types for
Temporary and Permanent Impacts to Seasonal Wetlands and Vernal Pools

Impact type	Impact Totals	Mitigation Ratio	Mitigation Required (acres)	Mitigation Type	Mitigation Proposed (acres)
Permanent; fairy shrimp occupied	0.049	4:1	0.196	Vernal pool establishment	0.196
				Vernal pool enhancement in VP 1	0.280
Permanent; unoccupied	0.179	1:1	0.179	Vernal pool establishment	0.179
Temporary; fairy shrimp occupied*	0.471	2:1	0.942	*In-place vernal pool restoration	0.471
				Vernal pool establishment	0.471
Temporary unoccupied*	0.129	1:1	0.129	*In-place vernal pool restoration	0.129
Total Impacts			1.446	Total Mitigation	1.726

*Temporary impacts to vernal pools will be restored at a 1:1 ratio in place, with additional mitigation required, as discussed in the table.

4.2 Functions and Services of Seasonal Features and Vernal Pools to Be Impacted

The Project site contains numerous Pools throughout the upland mesa area. These depressions are likely anthropogenic in nature resulting from over 75 years of active oil operations on the property and are located in low areas, roads, road ruts and shoulders, tire ruts, parking areas, oil sumps, and both abandoned and active oil well pads. Therefore, the existing pools currently provide limited habitat functions and services as they are disturbed by non-native grasses and native vegetation that is uncharacteristic of vernal pools, and sustain limited buffers between the ongoing oil operations.

Though the Pools themselves are for the most part in poor health, there is potential for long-term dispersal of sensitive plants and animals between Pools. The primary function of the existing Pools currently is to provide open habitats acting as foraging habitat for raptor species, including the northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*). One seasonal feature that will be

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

impacted by the project, Feature E, provides habitat for the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*), but is a documented oil sump requiring remediation.

4.2.1 CRAM Analysis of Functions and Services

A baseline assessment of the ecosystem condition for specifically the vernal pools impacted by the Project (features VP1 and VP2 only) shall be conducted prior to the onset of impacts using CRAM. Temporary impacts are proposed to occur in VP1 and VP2, therefore a CRAM assessment will be used to determine the condition of these vernal pools prior to impacts and post restoration efforts.

A second CRAM assessment will be performed in the fifth year of the long-term mitigation and monitoring period on the two vernal pools (VP1 and VP2) that will be temporarily impacted and restored, as well as on the proposed 0.84 acres of established vernal pools. The CRAM assessment in the fifth year will be conducted to assess the functions and services of the individual vernal pools once the mitigation installation is complete. A successful project will demonstrate an increasing trend from the baseline CRAM assessment.

The purpose of CRAM is to provide a rapid, standardized, and scientifically defensible assessment of the status of a wetland according to the most recent version of CRAM Version 6.1 (Collins et al. 2013). As part of that assessment using the CRAM Individual Vernal Pools Field Book 6.1, a variety of landscape context, hydrology, and structure attributes and associated metrics will be assessed and compared to CRAM scores demonstrated prior to the implementation of impacts. The CRAM will help assess the functions and services of the vernal pool system over time.

4.3 Site Selection and Proposed Mitigation Sites

The proposed vernal pool mitigation areas (the vernal pool complexes) are considered suitable for vernal pool establishment as a result of the presence of appropriate soils and topography, and the presence of adjacent existing vernal pools. The sites are flat to gently sloping, with less than a 9% grade. Soils within the sites are mapped as Myford Sandy Loam (USDA-NCRS 2013). The Myford series consists of moderately well drained soils on marine terraces. These soils formed in sandy sediments. Slopes ranged from nearly level to a moderately sloping 9%. A typical profile exhibits matrix colors of 10YR 4/3 from 0-1 inch when moist, 7.5YR 4/2 from 1-12 inches, and 7.5YR 3/2 from 12-28 inches (Dudek 2013). Myford Sandy Loam soils are known to be hydric.

The vernal pool complex areas support approximately 8 Pools in the eastern complex and 2 Pools in the southwestern complex (Dudek 2013). The proximity of the Pools in these areas and the concentration of the Pools within the vernal pool complexes indicate that the associated clay

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

layer needed to support vernal pools and seasonal features is present (discussions with Chris Medak). Further soil studies are necessary to determine the extent of the clay layer and to pinpoint more precisely where vernal pool establishment will occur within the vernal pool complex. Areas supporting special-status plant species were not considered suitable for vernal pool mitigation in order to avoid direct and indirect impacts to these resources. The vernal pool complexes will be thoroughly surveyed for special status plant species to ensure these species are avoided prior to mitigation implementation.

The vernal pool complex to the east has also been selected as the location for purple needlegrass grassland establishment, which shall provide buffer areas surrounding the established, enhanced, and restored vernal pools. The established vernal pool in the southwestern portion of the mesa will also be buffered by established annual grassland. Grassland establishment within the vernal pool complex will also enhance wintering habitat for burrowing owl that has periodically been observed on site.

4.4 Functions and Services of Mitigation Sites and Rationale for Expecting Success

Mitigation for permanent impacts to 0.049 acre of fairy shrimp occupied habitat and 0.179 acre of unoccupied fairy shrimp habitat, and temporary impacts to 0.471 acre of fairy shrimp occupied habitat and 0.129 acre unoccupied habitat will be accomplished through the enhancement of Feature VP1, the establishment of 0.84 acre of vernal pool habitat, and the restoration of those Pools that were temporarily impacted from oil remediation and abandonment activities.

The overall goal of this mitigation effort is to increase the functions and services of existing Pool habitats and establish self-sustaining vernal pools to an extent that would, at a minimum, replace the functions and services lost by Project implementation. Functions and services that shall be replaced and improved include providing habitat for the federally endangered San Diego fairy shrimp (*Branchinecta sandiegonensis*). Additional functions and services that will be improved by the implementation of the vernal pool mitigation effort includes the improvement and development of foraging habitat for raptor species, including the northern harrier (*Circus cyaneus*), white-tailed kite (*Elanus leucurus*), red-tailed hawk (*Buteo jamaicensis*), and American kestrel (*Falco sparverius*).

The established vernal pools are intended to support vernal pool plant indicator species and function as viable, self-sustaining vernal pool basins that could potentially create a hydrologically connected complex of vernal pools. The vernal pool complexes are expected to be successful because soils are suitable for vernal pool establishment (USDA-NRCS 2013), and the established pools are proposed to be constructed adjacent to existing vernal pools. Further soil

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

studies are necessary, however, to determine the extent of the clay layer within the vernal pool complex areas, which will determine more precisely where vernal pool establishment will occur. The establishment of vernal pools in each of the vernal pool complexes could potentially increase hydrological input to the existing Pools, which will promote longer-term ponding for San Diego fairy shrimp to complete its life cycle.

Furthermore, overall habitat improvements in the eastern complex will also occur with the implementation of enhancement in the existing larger vernal pool, VP1. Enhancement activities involve the removal of non-native and native species uncommon to vernal pools and the revegetation of bare areas with the appropriate native vernal pool species (see Section 4.6). Enhancement of VP1 by removing mulefat and non-native species will restore the vernal pool to characteristic vernal pool habitat, as vernal pools do not typically support woody vegetation such as mulefat. This enhancement will provide increased wildlife habitat function for migratory birds that use the Pools as a migration stopover and provide further improved foraging habitat.

Since the existing Pools in the vernal pool complex areas have persisted for many years adjacent to ongoing oil operations and other stressors, it is reasonable to expect that the mitigation efforts will be successful. Establishing buffers around the vernal pool complexes will assist in the development of seeded species that are specific to vernal pools. This will, in turn, assist in the establishment of the vernal pool inoculum and the development of San Diego fairy shrimp within the vernal pools. In the eastern complex, approximately 8.0 acres of upland habitat surrounding the established and enhanced vernal pools will be established and preserved. An additional 2.91 acres of annual grassland habitat will also be established as a buffer for vernal pool establishment occurring in the southwestern complex. Maintenance of these buffer areas would consist of the control of invasive non-native species, and supplemental seeding and planting to meet established performance standards (see Section 5.0).

Restoration efforts occurring in Pools where temporary impacts are proposed to occur will improve the existing Pools, which will increase biological productivity and provide replacement and created foraging habitat for raptor species.

4.5 Site Preparation

This section describes the mitigation pre-construction process that is intended to achieve the target acreages for vernal pool mitigation. In general, the preparation for construction of mitigation will include the following activities:

- Establishing limits around the existing Pools, the vernal pool establishment areas, and the vernal pool complex using temporary fencing to delimit areas to avoid

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

- Site preparation including the removal of all non-native vegetation
- Grading and re-contouring vernal pool establishment areas and restoration areas (as needed)
- Soil inoculum installations and weed control (as needed)
- Installing temporary irrigation systems

4.5.1 Site Access and Project Limits

The Project Biologist, Restoration Contractor, and resource agencies will be given access to the mitigation site for monitoring and maintenance. No public access will be provided to the vernal pool mitigation site.

The Project Biologist will delimit the areas where vernal pool establishment will occur. These areas will be clearly demarcated with temporary orange construction fencing and erosion control silt-fencing, and maintained through the first growing season. In addition, orange construction fencing and erosion control silt fencing will identify the limits of the eastern vernal pool complex. Fencing around the entire vernal pool complex will remain in place and be maintained by the Restoration Contractor throughout the long-term mitigation and monitoring period or until a permanent fence can be constructed. Permanent barrier fencing and signage will be installed on proposed public areas that are adjacent to any of the vernal pool mitigation sites, which will provide the southwestern complex with protections against public intrusions. If the construction fencing is damaged by storm flows, it will be recommended for replacement based on the Project Biologist's discretion.

The boundaries of Pools that are proposed to be temporarily impacted through oil facility abandonment activities shall be determined in the field by collecting data using a handheld Global Positioning System (GPS) unit with sub-meter accuracy. This data will be kept to ensure that the Pools be restored in approximately the same areas as they were before temporary impacts occurred.

4.5.2 Existing Resource Impact Avoidance

For any questions or concerns relating to the environmental impacts to the site or surrounding vegetation communities during implementation of the vernal pool mitigation, the Restoration Contractor (or involved party) should consult the Project Biologist. Pools that exist within the vernal pool complex will be demarcated by the Project Biologist with orange construction fencing and avoided.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

4.5.3 Weed Removal

The vernal pool complexes shall be extensively weeded before any mitigation activities occur. Removed plant material shall be raked up by hand and disposed of in a legal manner off site. All species in the vernal pool not listed in Table 14 below will be targeted for removal. Initial and ongoing weed removal in the established, enhanced and restored Pools will be accomplished through hand removal. Weeds in the adjacent upland areas will be removed by hand whenever possible, but weed-whips may be used as needed. No herbicide will be used within or adjacent to any Pools. Focused herbicide application, however, may be used to control weeds in the upland area. Herbicides should not be used during wet or windy conditions. Care should be taken not to saturate the soils with herbicide. Weed species of major concern within the Pools and vernal pool complexes include, but are not limited to, filaree (*Erodium cicutarium*), star thistle (*Centaurea melitensis*), Italian ryegrass (*Lolium perenne* ssp. *multiflorum*), rabbitsfoot grass (*Polypogon monspeliensis*), and curly dock (*Rumex crispus*).

4.5.4 Topsoil and Inoculum Salvage

Prior to the onset of impacts to VP1 and VP2, which support San Diego fairy shrimp and hydrophytic vegetation, and Feature MM, which supports hydrophytic vegetation (Dudek 2013), topsoil salvage shall occur. Topsoil in vernal pools, or inoculum, includes plant litter and the top 1-2 mm of soil salvaged from a natural vernal pool area (Black and Zedler 1998). The inoculum contains seeds and propagules of vernal pool plant species, and eggs and resting structures of vernal pool fauna.

The vernal pool inoculum collected from four donor Pools (e.g., Feature MM, and vernal pools VP1 and VP2) will be temporarily stored under the direct supervision of the Project Biologist/Restoration Specialist. The soil will be kept in a dry location until it is deposited into the mitigation basins. This soil will contain fairy shrimp cysts, as well as seed from plants that existed in the impacted basins. Hand tools (i.e., shovels and trowels) will be used to remove the first 1–2 inches of soil from the donor pools.

Inoculum will be placed in each of the established vernal pools, as well as in all Pools that will be temporarily disturbed and restored, with each of the Pools receiving a share of the total collected inoculum material proportionate to its surface area. The collected soils will be spread out and raked into the bottoms of the established, enhanced and restored Pools under the direct supervision of the Project Biologist/Restoration Specialist.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

4.5.5 Grading and Construction Documents

The construction of the established pools will involve minor grading using a small skid steer to follow the existing topographic contours to deepen those areas to ensure inundation during wet years. Minimal grading will shape the new Pools. It is important that the clay layer not be damaged during vernal pool establishment. Further soil studies are necessary to determine the extent of the clay layer within the vernal pool complexes, which will determine more precisely where vernal pool establishment will occur and how grading will be accomplished. The grading specifics will be described in the associated construction drawings. Furthermore, the Project Biologist/Restoration Specialist will direct all grading of the established vernal pools in the field.

The following conditions shall be created prior to grading to establish the vernal pools:

- Grading will occur only when the soil is dry to the touch, both at the surface and one inch below.
- After a rain of greater than 0.2 inch, grading will occur only after the soil surface has dried sufficiently as described above and no sooner than 2 days (48 hours) after the rain event ends.
- Grading would commence only when no rain is forecast during the anticipated grading period.
- To prevent erosion and siltation from stormwater runoff due to unexpected rains, BMPs (i.e., silt fences and fiber rolls) would be implemented, as needed, during grading.
- If rain occurs during grading, work would stop and only resume after soils are dry, as described above.

Following approval of this HCCMP, construction drawings and specifications will be prepared for construction of the Mitigation Project purposes. Construction drawings and specifications will conform to all aspects of this HCCMP and permit conditions required by the Permitting Agencies. Construction documents will incorporate the most current site condition information available, as well as any additional soil sampling assessments that will be performed prior to the implementation of the vernal pool mitigation. Any significant changes to site conditions and final mitigation plans may be subject to review and comment by Permitting Agencies. The plan package will include a site plan showing proposed work areas and final site facilities, any additional grading, construction details, irrigation, and planting plans.

As-built plans for the mitigation areas will only be required if the installation substantially deviates from this HCCMP and/or the permit conditions.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

4.5.6 Erosion Control and Best Management Practices

Within the mitigation area, silt fences, fiber rolls, and construction fencing may be incorporated into the BMPs based on the construction documents and Project Biologist recommendation. Replacement of project fencing and BMPs affected/lost due to precipitation or other events will be replaced, modified, or not replaced at the discretion of the Project Biologist.

4.6 Plant Installation for Vernal Pool Areas

Grading to implement the vernal pool mitigation will occur in advance or concurrently with grading associated with the development and road construction. Shaping of the establishment areas and removal of mulefat and non-native species within the enhancement areas will occur concurrently with or immediately following grading of the establishment areas. Inoculum will then be placed in each of the established vernal pools, as well as in all Pools that will be temporarily disturbed and restored. The collected soils will be spread out and raked into the bottoms of the established and restored Pools. Following inoculum installation, hydroseed installation will occur in all vernal pool mitigation sites.

The composition of the proposed installed revegetation species is listed below in the plant palettes in Table 14. The intent of the plant palettes is to create a diverse assemblage of native plant species that are typical for these vernal pools and seasonal features, and to replace the functions and services of the impacted Pools with higher quality vernal pool habitat. Plant materials shall be from nursery-grown seed, depending on availability. Some seed may need to be collected on or near the mitigation site. Further material specifications shall be included in the construction documents.

4.6.1 Recommended Plant Palette for Vernal Pool Mitigation Areas

Table 14
Vernal Pool Mitigation Areas Plant Palette

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Cressa truxillensis</i>	alkali weed	7	0.5
<i>Deinandra fasciculata</i>	clustered tarweed	20	1.0
<i>Eleocharis macrostachya</i>	creeping spikerush	60	1.0
<i>Frankenia salina</i>	alkali heath	4	1.0
<i>Euthamia occidentalis</i>	western goldentop	7	1.0
<i>Heliotropium curassivicum</i>	seaside heliotrope	12	1.0
<i>Lasthenia californica</i>	California goldfields	50	1.0
<i>Malvella leprosa</i>	alkali sida	2	1.0

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 14
Vernal Pool Mitigation Areas Plant Palette

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Plantago erecta</i>	Western plantain	85	2.0
<i>Spergularia marina</i>	saltmarsh sand spurrey	20	0.5
Total Pounds per Acre			10

4.6.2 Hydroseed Installation

The hydroseed mixes have been prescribed for the established, enhanced and restored Pools. Labels for the seed mixes delivered to the site will be inspected and approved by the Project Biologist prior to mixing and application. All mixes are to include the specified seed mix at the prescribed rates per acre; virgin wood cellulose fiber mulch at 2,500 pounds per acre; commercial fertilizer at the specified rate, as directed by the Project Biologist during finish grading; and a commercial binder (Az-Tac or equivalent) at 150 pounds per acre.

All seeds will be clearly labeled showing type of seed, test date, the name of the supplier, and percentage of the following: pure seed, crop seed, inert matter, weed seed, noxious weeds, and total germination content. All material will be delivered to the site in original, unopened containers bearing the manufacturer's guaranteed analysis. All seed mixes will be stored in a dark, cool place and not be allowed to become damp.

Installation between the months of October to December are ideal for allowing establishment during the cooler and wetter time of the year. However, with the presence of a temporary above ground irrigation system, installation at any time of the year is possible if necessary.

While the initial seed application is proposed to consist of hydroseeding, additional seed may be hand broadcast, should the seed not be available at the time of initial hydroseed installation. The contractor should consult the Project Biologist in the event that a given species on the plant palette in Table 14 will not be available for inclusion into the initial hydroseed mix.

4.6.3 Irrigation System Installation

The primary goal of this vernal pool mitigation is to establish vernal pool habitats that are self-sustaining as a biological system and to create San Diego fairy shrimp habitat, as mitigation for Project impacts. In order to establish native seedmix and inoculum, irrigation is recommended to be used in the first few growing seasons, especially during summer months. A temporary aboveground spray irrigation system will be installed to support the seeded species and spread

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

inoculum until an effective plant rooting depth is achieved that can promote survival based solely on seasonal rainfall and overland flow.

All irrigation will be installed by the Restoration Contractor per construction documents and specifications. The irrigation system will be designed with aboveground components to facilitate removal once the system is decommissioned.. All irrigation will be used only for plant establishment. Irrigation use will be discontinued at least 2 years before the end of the 5-year maintenance period to demonstrate the vegetation community's ability to survive without supplemental water. Irrigation design and layout will be provided with the final construction documents.

The irrigation system may utilize a solar-operated controller that operates independent irrigation circuits, minimizing irrigation maintenance requirements for the site. Irrigation on site will likely consist of PVC or HDPE pipe staked at grade, with coverage provided by spray heads. Should portions of the irrigation system become damaged or lost, they will be replaced, and the design modified based on the individual circumstances per the Project Biologist's recommendations.

4.7 Final Performance Standards for Vernal Pool Areas

4.7.1 Quantitative Vernal Pool Hydrology Success Criteria

Quantitative seasonal basin hydrology monitoring will be conducted within the vernal pool complex as well as reference sites within the Natural Open Space Preserve. Features A and W, located south of the vernal pool complex, will be maintained intact with a surrounding grassland buffer making them suitable reference sites for hydrology monitoring. Approximately 24 Pools will be monitored as part of this success criteria, which includes established, enhanced and restored Pools.

Monitoring methods, data collection, and reporting protocols will be the same for mitigation and reference site locations. A site visit shall be conducted 1 week after any precipitation event of 0.10 inch or greater. Pools that are holding water will be recorded and the maximum depth of water recorded. Maximum depth should be measured from the location visually determined to be the deepest location. Two weeks after the precipitation event, the site will be revisited and the maximum water depth for pools with standing water will be recorded again. Monitoring will continue once every 2 weeks until basins are dry. Monitoring will be reinitiated following drying of the Pools, if a precipitation event of 0.10 inch or greater is recorded.

In addition to manually collected data, automated data collection devices will be installed in the vernal pool establishment areas and two within the reference site basins (between 8 – 9 devices total). The devices will collect data which will be downloaded during the monitoring visits and

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

will mainly be used to verify that basins did not dry between monitoring visits. The device will also record how quickly basins fill and dry. These devices will provide continuous monitoring of basin hydrology.

Hydrology for established, enhanced, and restored Pools will be monitored and compared to the hydrology monitoring results of the reference sites. At the end of the monitoring period, the monitored Pools would demonstrate hydrologic patterns similar to those of the reference sites. The monitoring period will be extended if a drought period prevents the Pools from demonstrating the desired hydrologic patterns.

For established and enhanced vernal pools, hydrology will be one aspect of the overall performance standards assessed. Hydrology directly affects the suitability of the established and enhanced vernal pools to support San Diego fairy shrimp habitat. Therefore, hydrologic data will be recorded for comparison with presence/absence of San Diego fairy shrimp and duration of ponding during the 5-year monitoring period. This will record the progress of the vernal pools towards being suitable San Diego fairy shrimp habitat. Further San Diego fairy shrimp success criteria is outlined below in Section 4.8.2.

4.7.2 San Diego Fairy Shrimp Success Criteria

For established and enhanced vernal pools, bi-weekly observations of the depth and duration of ponding, if present, will occur through each winter season. Observations of the presence or absence of San Diego fairy shrimp will also be made during hydrologic monitoring. When fairy shrimp are mature, a single sampling in each vernal pool will be conducted each season. The population of shrimp present would be estimated by order of magnitude. The number of gravid females also would be estimated.

In order for the San Diego fairy shrimp portion of the project to be considered successful, the shrimp should occur in each year that there is enough rainfall to produce, in at least two of the 6-8 established vernal pools and in the enhanced vernal pool (VP1). The populations in each year in the established vernal pools should either be stable or show an increasing trend over the monitoring period to be considered successful. If the established vernal pools exhibit appropriate hydrology but do not have sufficient presence of fairy shrimp, additional inoculum will be added.

4.7.3 Quantitative Vegetation Performance Standards

Vegetative performance standards will be utilized to help assess the annual progress of all of the established vernal pools, as well as certain enhanced and restored vernal pools, and will contain interim project objectives designed to achieve the final mitigation goals (Table 15). Specifically,

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

hydrophytic vegetation is expected to be present, and therefore will be quantitatively monitored, in the established vernal pools, the enhanced vernal pool (VP1), and in the restored vernal pool (VP2) and seasonal feature (MM) that sustained hydrophytic vegetation prior to impacts. Quadrat sampling will be used to measure the cover and composition of plant species within the established, enhanced and restored Pools. One meter square will be placed at random within each Pool. Percent cover of species present within the quadrat will be visually assessed and recorded. In addition, a cumulative plant species list shall be recorded once annually during the data collection site visit.

Fulfillment of these standards will indicate that the mitigation areas are progressing toward the long-term mitigation goals. If mitigation efforts fail to meet the performance standards listed in any one year, the Project Biologist will recommend remedial actions to be implemented (e.g., supplemental planting, inoculum additions) that will enhance the Pools to a level of conformance with these standards.

Table 15
Performance Standards for Established, Enhanced (VP1), and Restored Pools (VP2, MM)*

Year	Percent Native Cover**	Percent Bare Ground or Inorganic Cover	Maximum Percent Non-Native Cover
1	10	60	30
2	20	55	25
3	30	50	20
4	40	45	15
5	50	40	10

* Restored pools that are considered seasonal features that do not support hydrophytic vegetation shall not be quantitatively monitored and are not subject to vegetative performance standards.

** Vegetation cover is cumulative for shrubs and herbs.

Performance standards for development of suitable San Diego fairy shrimp habitat need to account for yearly variation in rainfall patterns. San Diego fairy shrimp are highly adapted to widely fluctuating patterns of inundation, and, therefore, an adequate inundation period need only be recorded periodically as afforded by natural precipitation and weather patterns. Monitoring of the Pools should reveal a similar pattern of inundation as recorded at the reference site. This data will help determine any remedial measures that may be necessary during the 5-year monitoring and maintenance period. Basin hydrology will be monitored in accordance with Section 4.8.1.

4.7.4 CRAM Performance Standards

In the fifth year of the long-term maintenance and monitoring period, the functions and services of the two vernal pools (VP1 and VP2) that will be temporarily impacted and restored, as well as

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

the individual established vernal pools will be assessed using a comparative CRAM analysis. The CRAM assessment in the fifth year will be conducted to assess the functions and services of the individual vernal pools once the mitigation installation is complete. A successful project will demonstrate an increasing trend from the baseline CRAM assessment.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

5.0 MITIGATION IMPLEMENTATION PLAN FOR GRASSLAND AND SCRUB AREAS

5.1 Goals of the Proposed Mitigation

Grassland and scrub area establishment and restoration efforts aim to increase biological productivity within the Natural Open Space Preserve, and provide enhanced wildlife habitat in areas on site that are currently ruderal, developed, historically maintained, or disturbed habitats. Areas supporting special-status plant species were not considered suitable for grassland or scrub mitigation in order to avoid direct and indirect impacts to these resources.

Impacts to purple needlegrass habitat through implementation of the Project will be mitigated through the establishment of purple needlegrass grassland (PNGG) in the eastern vernal pool complex area, acting as a buffer to the established, enhanced, restored, and existing Pools, and intermixed throughout existing and establishment/enhancement scrub areas on the mesa (Figures 5-6c). Approximately 4.74 acres of established PNGG mitigation will be installed in areas that are currently ruderal or developed, non-functional habitats. The established PNGG habitat will provide wildlife habitat for a variety of small mammal species that will in turn provide forage for a variety of potential raptors, such as white-tailed kite (*Elanus leucurus*), Cooper's hawk, red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), Loggerhead shrike (*Lanius ludovicianus*), long-eared owl (*Asio otus*), American kestrel (*Falco sparverius*), ferruginous hawk (*Buteo regalis*), American peregrine falcon (*Falco peregrinus anatum*), and merlin (*Falco columbarius*). In addition, portions of the upland grassland will provide wintering habitat for burrowing owl (*Athene cunicularia*).

To mitigate for impacts to non-native and annual grassland impacts on site, restoration in ruderal, disturbed or developed habitats (some of which occur in areas that will be temporarily impacted through oil remediation activities) will occur. Two types of restoration are proposed: salt-tolerant transitional grassland establishment in the lowlands, and annual grassland buffer establishment around existing and established vernal pools and water quality basins in the mesa area. The lowland areas were chosen for grassland mitigation to broaden the foraging habitat for raptors and avian species with the intent of creating a comprehensive restored watershed area. In addition, the lowland salt tolerant grasslands will provide nesting and foraging habitat for short-eared owl (*Asio flammeus*). Suitable habitat for short-eared owl has become rare in Orange County, therefore, the proposed grassland establishment in the lowlands represents a significantly important mitigation measure. Annual grassland surrounding the southwestern vernal pool establishment and water quality basin areas in the mesa will similarly provide a continuous corridor of open space preserved areas, and provide foraging habitat for additional target wildlife species, such as the California gnatcatcher.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

For impacts to ESHA and coastal sage scrub habitat types, coastal sage scrub (CSS) and maritime succulent scrub (MSS) establishment, enhancement and restoration is proposed. An additional 35.08 acres of CSS revegetation is proposed to occur in areas slated to be preserved as Natural Open Space. Scrub mitigation areas aim to provide suitable habitat for a variety of avian species such as California towhee (*Pipilo crissalis*), Bewick's wren (*Thryomanes bewickii*), coastal California gnatcatcher, coastal cactus wren (*Campylorhynchus brunneicapillus*), bushtit (*Psaltiriparus minimus*), black phoebe (*Sayornis nigricans*), white-crowned sparrow (*Zonotrichia leucophrys*), wren tit (*Chamaea fasciata*), and yellow-rumped warbler (*Dendroica coronata*).

5.1.1 Target Acreages for Grassland Mitigation

A total of 42.2 acres of potentially suitable raptor foraging habitat, most of which (33.0 acres) is maintained non-native grassland, will be permanently impacted by the Project (Table 16). An additional 1.15 acres of potentially suitable raptor foraging habitat will be temporarily impacted. Temporary impacts may be less than proposed and, subsequently, restoration acreages would be reduced accordingly. In accordance with recommendations by the resource agencies, which typically require a mitigation ratio of 0.5:1 for impacts to non-native annual grassland, the permanently and temporarily impacted foraging habitat will be mitigated through a total of 22.07 acres of mitigation. Approximately 4.74 acres of PNGG will be established in areas that are currently ruderal or disturbed, with an additional 0.35 acre of PNGG being temporarily impacted and 0.18 acre restored. Approximately 9.16 acres of salt-tolerant transitional grassland habitat will be restored in the lowland areas to mitigate for impacts to undisturbed non-native grassland. An additional, 7.58 acres of annual grassland establishment in ruderal or disturbed areas in the mesa will also be established, with 0.41 acres of annual grassland restoration to mitigate for temporary impacts.

Table 16
Summary of Proposed Mitigation by Impact and Mitigation Types for
Temporary and Permanent Impacts to Grassland Habitats

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation Type	Mitigation (Acres)
Permanent Purple Needlegrass Grassland Habitat	9.19	0.5:1	Establishment, purple needlegrass	4.74
Permanent Undisturbed Non-Native Grassland Habitat	32.99	0.5:1	Transitional salt-tolerant grassland establishment in lowlands (9.16 acre); and annual grassland establishment in mesa (7.35 acre)	16.51
Permanent Disturbed Annual Brome Grassland Habitat	0.06	0.5:1	Annual grassland establishment in mesa	0.03
Temporary Purple Needlegrass Grassland Habitat	0.35	1:1	In-place restoration, purple needlegrass	0.18

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 16
Summary of Proposed Mitigation by Impact and Mitigation Types for
Temporary and Permanent Impacts to Grassland Habitats

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation Type	Mitigation (Acres)
Temporary Undisturbed Non-Native Grassland Habitat	0.71	0.5:1	In-place restoration, annual grassland restoration	0.36
Temporary Disturbed Non-Native Grassland Habitat	0.09	0.5:1	In-place restoration, annual grassland restoration	0.05
Total Grassland Impacts	44.17		Total Grassland Mitigation	26.49

5.1.2 Target Acreages for Scrub Mitigation

The proposed Project will result in permanent impacts to 11.85 acres of undisturbed and disturbed scrub habitats, which include the habitat types of maritime succulent scrub (MSS), southern coastal bluff scrub (SCBS), and coastal sage scrub (CSS) (Table 17). Impacts to the 2.86 acres of undisturbed scrub habitats will be mitigated on site at a 3:1 ratio, while impacts to disturbed scrub habitats will be mitigated at a 1:1 ratio. Altogether, 17.57 acres of scrub mitigation are required; the proposed mitigation exceeds these requirements. Approximately 3.18 acres of scrub establishment in ruderal or disturbed habitats and 16.46 acres of scrub enhancement in areas that are disturbed MSS, SCBS, or CSS is proposed, totaling 19.64 acres of scrub mitigation.

In addition to the required scrub mitigation, revegetation with CSS species in disturbed, ruderal, and/or developed areas will occur. The CSS revegetation areas occur in areas that are currently highly disturbed with limited functions and services to wildlife; therefore the installation of native species in these areas will provide supplementary habitat for wildlife foraging and nesting. Once revegetated, these areas will be preserved within the Natural Open Space Preserve on site. Furthermore, the CSS revegetation areas will serve to connect currently disjointed native landscapes that will be preserved in place, increasing the overall value of the existing native communities on site. Approximately 35.08 acres of CSS revegetation is proposed to occur in areas that will be preserved on site as Natural Open Space.

The project will also result in temporary impacts to 9.76 acres of undisturbed and disturbed scrub habitats, both of which will be mitigated at a 1:1 ratio. Temporary impacts to scrub habitat, except temporary impacts occurring to scrub habitat in the lowlands, will be restored in place at a 1:1 ratio. Temporary impacts to scrub habitat in the lowlands will be mitigated as scrub establishment areas in ruderal or disturbed habitats in the mesa. Temporary impacts may be less than proposed and, subsequently, restoration acreages would be reduced accordingly.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 17
Summary of Proposed Mitigation by Impact and Mitigation Types for
Temporary and Permanent Impacts to Scrub Habitats

Impact Type	Impact (Acres)	Mitigation Ratio	Mitigation Type	Mitigation (Acres)
Permanent - Scrub Habitat	2.86	3:1	Establishment scrub habitat	3.18
			Enhancement scrub habitat	7.47
Permanent - Disturbed Scrub Habitat	8.99	1:1	Enhancement scrub habitat	8.99
Temporary - Scrub Habitat	4.23	1:1	In-place restoration, scrub habitat*	4.23
Temporary - Disturbed Scrub Habitat	5.53	1:1	In-place restoration, scrub habitat	5.53
Total Scrub Impacts	21.61		Total Scrub Mitigation	29.40

* Temporary impacts to 0.00 acres of scrub habitat in the lowlands will be mitigated at a 1:1 ratio through establishment.

5.2 Site Selection and Type(s) of Habitat to be Established/Restored for Mitigation

5.2.1 Grassland Mitigation

Impacts to PNGG will be mitigated for in the eastern vernal pool complex area, which will act as a buffer to the established, enhanced, restored, and existing Pools, and in ruderal or disturbed habitats adjacent to existing and establishment/enhancement scrub areas on the mesa. These selected areas had appropriate soils for native grassland establishment, as evidenced through soil maps (USDA-NRCS 2013) and adjacent existing PNGG habitat. Altogether, approximately 4.74 acre of established PNGG mitigation will be installed in areas that are currently ruderal or developed, non-functional habitats.

PNGG habitat occurs along the entire coast of California. It includes the perennial bunchgrass purple needlegrass (*Stipa pulchra*) as a dominant or co-dominant grass. These communities are mid-height grasslands, typically up to 2 feet tall. According to Holland (1986), native and introduced annuals grow between bunches of purple needlegrass and often exceed it in cover. Trees or shrubs may also be present within the grassland. PNGG occurs on deep soils that have high clay content. Sites that are moist or waterlogged during winter and very dry during summer were considered more favorable.

In the mesa area adjacent to preserved and established Pools and a water quality basin, 7.38 acres of annual grassland with native species emphasized in the plant palette (see Section 5.4.1), will be established in areas that are currently disturbed or ruderal to mitigate for impacts to non-native disturbed and undisturbed grasslands. The intent in this mitigation approach is to create grassland habitats in ways that mimic what could have been present on site prior to the

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

disturbance from oil production activities. Furthermore, the grasslands will act as buffers to preserved and established Pools and to the water quality basin in the east that will support native freshwater marsh species.

The lowland areas were chosen for grassland mitigation to broaden the foraging habitat for raptors and avian species, with the overall intent of creating a comprehensive restored watershed area. Salt-tolerant transitional grassland is not a vegetation community specifically described by Holland or others, but is being established in replacement for non-native grassland vegetation impacted by the Project with the specific aim of replacing foraging habitat for raptors. Salt-tolerant grassland species have been chosen for revegetating to accommodate the slightly saline condition of the southeastern portion of the lowlands. For further details regarding the species composition of the salt-tolerant transitional grassland habitat, refer to Section 5.4.

5.2.2 Scrub Mitigation

The scrub habitats to be established as mitigation for permanent impacts shall provide similar or better functions and services than they currently do. Currently, native scrub on site is either largely disturbed or disjointed by developed areas and ongoing oil extraction activities and related oil field maintenance practices. Impacts to these sometimes disturbed areas are being mitigated for with scrub establishment, enhancement, and restoration when impacts are temporary in nature.

In addition to the required scrub mitigation, revegetation with CSS species in disturbed, ruderal, and developed areas will occur. The CSS revegetation areas occur in areas that are currently highly disturbed with limited functions and services to wildlife; therefore the installation of native species in these areas will provide supplementary habitat for wildlife foraging and nesting. Once revegetated, these areas will be preserved within the Natural Open Space Preserve on site. Furthermore, the CSS revegetation areas will serve to connect currently disjointed native landscapes that will be preserved in place, increasing the overall value of the existing native communities on site and connect with other adjacent open space lands.

5.3 Proposed Site Preparation

5.3.1 Initial Non-Native Invasive Plant Removal and Soil Preparation

In the upland mitigation and revegetation areas, all perennial and annual weeds and/or exotic species (e.g., black mustard, fennel and hotentot fig) shall be treated and controlled with a systemic herbicide prior to planting/seeding. All native species existing in the mitigation and revegetation areas shall be avoided to the maximum extent practicable. Dead weed/exotic organic matter shall

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

be physically removed from the area once the root systems are dead, unless used as a mulch base. Anthropogenic trash and debris shall be removed from the sites prior to implementation.

Upon completion of the non-native weed removals in the upland mitigation and revegetation areas, soils analysis shall also be completed. Soils shall be amended as recommended by the soil laboratory analysis, to ensure suitable soil is present for healthy native plant growth. Prior to planting and/or seeding, mitigation and revegetation areas shall be cleared of any dead plant material and/or other debris to expose bare mineral soil and shall be tilled to provide a friable soil surface. Soil shall be de-compacted (if necessary), as determined by the Project Biologist, by ripping to an 8-inch depth in opposing directions. The Project Biologist shall approve all soil preparation and amending prior to planting and/or seeding.

5.4 Plant Installation

The composition of the proposed grassland mitigation is listed below in the plant palettes in Tables 18 to 20. The composition of the proposed scrub mitigation is listed below in the plant palettes in Tables 21 to 22. The composition of the proposed CSS revegetation is listed below in Table 23. The intent of the plant palettes is to create a diverse assemblage of native plant species that are typical for purple needlegrass grassland areas (Table 18), grassland areas adjacent to alkali meadows (Table 19), for annual grassland areas interspersed through scrub habitats (Table 20), and for CSS (Table 21; Table 23) and MSS (Table 22) scrub areas with aim to create specifically gnatcatcher suitable scrub habitat. Plant materials shall be from nursery-grown container plants or seed, depending on availability. Some seed may need to be collected on or near the mitigation site. Further material specifications shall be included in the construction documents.

5.4.1 Recommended Plant Palettes for Grassland Areas

Table 18
Purple Needlegrass Grassland Plant Palette

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Castilleja exserta</i>	purple owl's clover	25	1
<i>Lasthenia californica</i>	California goldfields	70	1
<i>Lupinus bicolor</i>	annual lupine	90	12
<i>Melica imperfect</i>	coast Range melica	4	4
<i>Stipa lepida</i>	foothill needlegrass	85	8
<i>Stipa pulchra</i>	purple needlegrass	35	15
Total Pounds per Acre			41

Note: All hydroseed mixes shall include seed mix indicated in pounds per acre and virgin wood cellulose fiber mulch at 2,500 pounds per acre.*To be collected and hand broadcast.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 19
Salt-Tolerant Transitional Grassland Plant Palette

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Amsinckia menziesii</i>	fiddleneck	25	4
<i>Bromus carinatus</i>	California brome	85	3
<i>Camissonia bistorta</i>	California suncup	60	1
<i>Cressa truxillensis</i>	alkali weed	7	3
<i>Distichlis spicata</i>	salt grass	70	3
<i>Frankenia salina</i>	alkali heath	4	2
<i>Grindelia camporum</i>	gumplant	70	1
<i>Heliotropium curassavicum</i>	salt heliotrope	12	2
<i>Lasthenia glabrata</i>	yellowray goldfields	85	1
<i>Leymus triticoides</i>	beardless wildrye	75	8
<i>Limonium californicum</i>	California sea lavender	20	1
<i>Melica imperfect</i>	coast range melica	70	4
Total Pounds per Acre			33

Note: All hydroseed mixes shall include seed mix indicated in pounds per acre and virgin wood cellulose fiber mulch at 2,500 pounds per acre.

*To be collected and hand broadcast.

Table 20
Annual Grassland Plant Palette

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Bromus carinatus</i>	California brome	85	2
<i>Dichelostemma capitatum</i>	blue dicks	80	4
<i>Lotus purshianus</i>	Spanish clover	75	5
<i>Lupinus bicolor</i>	annual lupine	90	8
<i>Lupinus succulentus</i>	arroyo lupine	90	3
<i>Melica imperfect</i>	coast range melica	4	4
<i>Sisyrinchium bellum</i>	blue-eyed grass	80	2
<i>Stipa lepida</i>	foothill needlegrass	85	8
<i>Stipa pulchra</i>	purple needlegrass	35	10
<i>Vulpia microstachys</i>	small fescue	85	8
Total Pounds per Acre			54

Note: All hydroseed mixes shall include seed mix indicated in pounds per acre and virgin wood cellulose fiber mulch at 2,500 pounds per acre.

*To be collected and hand broadcast.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

5.4.2 Recommended Plant Palettes for Scrub Areas

Table 21
CSS Plant Palette for Establishment, Enhancement and Restoration Areas

Botanical Name	Common Name	Container Plants	Average Spacing (feet on center)	Percent of Planted Area
<i>Artemisia californica</i>	California sagebrush	1 gallon	5	45%
<i>Baccharis pilularis</i>	coyote bush	1 gallon	3	5%
<i>Encelia californica</i>	California brittlebush	1 gallon	5	2%
<i>Eriogonum fasciculatum</i>	flat-topped buckwheat	1 gallon	5	15%
<i>Isocoma menziesii</i>	Menzies' goldenbush	1 gallon	4	2%
<i>Isomeris arborea</i>	Bladderpod	1 gallon	5	5%
<i>Opuntia littoralis</i>	Coast Prickly Pear	1 gallon	5	8%
<i>Rhus integrifolia</i>	lemonade berry	1 gallon	8	5%
<i>Salvia apiana</i>	White sage	1 gallon	5	5%
<i>Salvia melifera</i>	Black sage	1 gallon	5	8%
Botanical Name	Common Name	Minimum PLS	Pounds per Acre	
<i>Artemisia californica</i>	California sagebrush	10	3	
<i>Encelia californica</i>	California sunflower	25	4	
<i>Eriogonum fasciculatum</i>	California buckwheat	10	15	
<i>Eriophyllum confertiflorum</i> var. <i>confer.</i>	golden yarrow	25	1	
<i>Pseudognaphalium bicolor</i>	cudweed	2	2	
<i>Isocoma menziesii</i>	coast goldenbush	15	3	
<i>Lotus scoparius</i>	deerweed	85	2	
<i>Mimulus aurantiacus</i>	bush monkeyflower	2	1	
<i>Scrophularia californica</i> var. <i>floribunda</i>	California figwort	60	1	
<i>Stipa pulchra</i>	Purple needlegrass	75	10	
Total Pounds per Acre			42	

Table 22
MSS Plant Palette for Establishment, Enhancement and Restoration Areas

Botanical Name	Common Name	Container Plants	Average Spacing (feet on center)	Percent Composition
<i>Artemisia californica</i>	California sagebrush	1 gallon	5	40%
<i>Baccharis pilularis</i>	coyote bush	1 gallon	3	10%
<i>Encelia californica</i>	California brittlebush	1 gallon	5	4%
<i>Eriogonum fasciculatum</i>	flat-topped buckwheat	1 gallon	5	10%
<i>Isomeris arborea</i>	Bladderpod	1 gallon	5	10%
<i>Opuntia prolifera</i>	coastal cholla	1 gallon	5	10%
<i>Opuntia littoralis</i>	coast prickly pear	1 gallon	5	10%
<i>Rhus integrifolia</i>	lemonade berry	1 gallon	8	6%

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 21
CSS Plant Palette for Establishment, Enhancement and Restoration Areas

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Artemisia californica</i>	California sagebrush	10	6
<i>Encelia californica</i>	California sunflower	25	4
<i>Eriogonum fasciculatum</i>	California buckwheat	10	20
<i>Eriophyllum confertiflorum</i> var. <i>confer.</i>	golden yarrow	25	2
<i>Stipa lepida</i>	foothill needlegrass	65	2
Total Pounds per Acre			34

Table 23
CSS Revegetation

Botanical Name	Common Name	Minimum PLS	Pounds per Acre
<i>Artemisia californica</i>	California sagebrush	10	10
<i>Bromus carinatus</i>	California brome	85	4
<i>Eriogonum fasciculatum</i>	buckwheat	10	15
<i>Eriophyllum confertiflorum</i> var. <i>confer.</i>	Golden yarrow	25	1
<i>Eschscholzia californica</i>	California poppy	85	1
<i>Lotus scoparius</i>	deerweed	85	3
<i>Salvia mellifera</i>	black sage	40	5
<i>Stipa pulchra</i>	purple needlegrass	75	5
<i>Vulpia microstachys</i>	small fescue	85	5
Total Pounds per Acre			49

The CSS revegetation areas occur in areas that are currently ruderal, developed, or disturbed habitats. Once revegetated, these areas will be preserved within the Natural Open Space Preserve on site. CSS revegetation areas will be seeded consecutively in Years One, Two and Three with the above seedmix to spur growth and establishment of CSS native species in areas that are currently highly disturbed.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

5.4.3 Container Plant Installation

All container plants will be checked for viability and general health upon arrival at the mitigation site by the Project Biologist. Plant materials not meeting acceptable standards will be rejected. Plant species and quantities will be confirmed after delivery by the Project Biologist. Container plants shall be laid out by the contractor, and their placement verified and adjusted by the Project Biologist.

Standard planting procedures will be employed for installing container plants. Holes approximately twice the width of the rootball of the plant and the same depth will be dug using a post hole digger or power auger. Holes will be filled with water and allowed to drain immediately prior to planting. Backfill soil containing amendments (per formal soils analysis recommendations and as directed by the Project Biologist) will be placed in every planting hole following soaking, and container plants will be installed so that the root ball is entirely below grade.

5.4.4 Hydroseed

Individual mixes have been prescribed for the different vegetation communities. Labels for each seed delivered to the site will be inspected and approved by the Project Biologist prior to mixing and application. All mixes are to include the specified seed mix at the prescribed rates per acre; virgin wood cellulose fiber mulch at 2,500 pounds per acre; commercial fertilizer at the specified rate, as directed by the Project Biologist during finish grading; and a commercial binder (Az-Tac or equivalent) at 150 pounds per acre.

All seeds will be clearly labeled showing type of seed, test date, the name of the supplier, and percentage of the following: pure seed, crop seed, inert matter, weed seed, noxious weeds, and total germination content. All material will be delivered to the site in original, unopened containers bearing the manufacturer's guaranteed analysis. All seed mixes will be stored in a dark, cool place and not be allowed to become damp.

Installation between the months of October to January are ideal for allowing establishment during the cooler and wetter time of the year. However, with the presence of a temporary above ground irrigation system, installation at any time of the year is possible if necessary.

While the initial seed application is proposed to consist of hydroseeding, additional seed may be hand broadcast, should the seed not be available at the time of initial hydroseed installation. The contractor should consult the Project Biologist in the event that a given species on the plant palette will not be available for inclusion into the initial hydroseed mix.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

5.4.5 Irrigation System Installation

A temporary above ground spray irrigation system will be installed to support PNGG, salt-tolerant grassland, and scrub establishment, enhancement, and restoration areas. Irrigation is intended to support vegetation development until plants are self-sustaining, based on observed and predicted seasonal rainfall and effective plant rooting depth. Germination and seedling establishment will also progress much more rapidly than if left to seasonal rainfall patterns within the first few growing seasons. Irrigation systems in the CSS revegetation areas will only be installed in areas where the natural grade of the area was disturbed (i.e. fill slope) through earth moving activity. CSS revegetation areas will be seeded consecutively in Years One, Two and Three to spur growth and establishment of CSS native species in areas that are currently highly disturbed.

In addition to species establishment, the irrigation system may be used for site preparation prior to plant and seed installation to induce germination of non-native species for “grow and kill” cycles. This may consist of running the irrigation regularly until germination of seeds within the soil’s seed bank occurs. Once seedlings are big enough to be positively identified, they may be controlled. Appropriate native species which have germinated may be left in place. This cycle of grow and kill may be repeated until the non-native seed bank within the sites has reached a desirable level. Grow and kill cycles are not recommended for the PNGG or annual grassland areas within the vernal pool complexes.

All irrigation will be installed by the installation contractor under direction of the Project Biologist. The irrigation system should be designed with above ground components to facilitate removal once the system is decommissioned. The irrigation system would use programmable valves that would operate independent irrigation circuits, minimizing irrigation maintenance requirements for the site. All irrigation on site would consist of UV resistant polyvinyl chloride (UV-PVC) pipe staked at grade, with 100% coverage from spray heads.

The goal of the restoration project is to create native, self-sustaining plant communities. Ideally, irrigation use would be discontinued at least 2 years before the end of the maintenance and monitoring period to demonstrate the vegetation communities’ ability to survive without supplemental water. The Project Biologist will consult with the client and the Restoration Contractor regarding the watering schedule during the monitoring period and the timing for the cessation of irrigation. Irrigation should stop at the earliest possible date without risking significant loss of plantings.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

5.5 Final Performance Standards

PNGG establishment areas on the mesa will include areas within the eastern vernal pool complex and ruderal and/or disturbed habitats adjacent to existing and establishment/enhancement scrub areas. PNGG restoration areas are typically located throughout the mesa scrub area in and around Drainage C. PNGG typically includes the perennial bunchgrass purple needlegrass (*Stipa pulchra*) as a dominant or co-dominant grass. The performance criteria listed in Table 24 aim to achieve the establishment of PNGG dominant habitat in the various PNGG mitigation areas.

Table 24
Performance Standards for PNGG Mitigation Areas

Year	Percent Survival of Container Plants	Percent Native Cover*	Percent Non-Native Cover ¹	Height Grasses (inches) ²
1	90%	30%	15%	6.
2	90%	40%	12%	12
3	90%	50%	10%	18
4	90%	60%	8%	18
5	90%	70%	5%	24

Notes:

Percent Survival = total percentage survival of all container plants.

1 = this is an annual maximum value (note that no invasive/exotic species cover is allowed in any year)

2 = this is an average grass species height in inches based on visual estimate

* Percentage value based on visual estimates in years 1 and 2 and quantitative transect data in years 3 through 5.

Performance standards for salt-tolerant transitional grasslands and annual grasslands are listed in Table 25. These standards are based upon expected vegetative development for the specific vegetative community and are derived from current on-site conditions of similar vegetative communities found on site.

Table 25
Performance Standards for Salt-Tolerant Transitional Grasslands and Annual Grasslands

Year	Maximum Percent Non-Native Plant Cover ¹	Percent Native Plant Cover*
1	50	10
3	30	25
5	25	50

* Percentage value based on visual estimates.

¹ This is an annual maximum value (note that no invasive/exotic species cover is allowed in any year)

In the CSS and MSS mitigation areas, which consist of the establishment, enhancement, and temporary impact restoration areas, native cover interim performance standards are aimed at achieving 80% cover of native scrub species by the fifth year (Table 26) or use by CAGN . This

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

is a high level of cover, however, the adjacent areas selected for scrub mitigation already support CSS and MSS species, therefore a high degree of cover success is expected. The plant palette for the CSS and MSS mitigation areas was designed to provide an appropriate mix of native scrub species with a specific focus on increasing California sagebrush to provide improved habitat for the California gnatcatcher.

Table 26
Performance Criteria for CSS and MSS Mitigation Areas

Year	Percent Survival of Container Plants	Percent Native Cover*	Percent Non-Native Cover ¹
1	100%	40%	15%
2	90%	50%	12%
3	90%	60%	10%
4	90%	70%	8%
5	90%	80%	5%

Notes:

Percent Survival = total percentage survival of all container plants.

Percent Cover = total percent cover of all native plant species, including trees, shrubs, and herbs.

¹ This is an annual maximum value (note that no invasive/exotic species cover is allowed in any year)

* Percentage value based on visual estimates in years 1 and 2 and quantitative transect data in years 3 through 5.

The performance standards for the CSS revegetation areas are shown in Table 27. In the CSS revegetation areas, the intent is to establish CSS scrub species that will serve to connect existing native habitats and create a contiguous habitat supportive of native wildlife species to be preserved within the Natural Open Space Preserve. Because these revegetation areas are in addition to the required mitigation being met on site, the CSS revegetation areas are not subject to the same performance standards as the establishment, enhancement, and temporary impact restoration areas. Due to the lack of irrigation that will be installed in the CSS revegetation areas (except in manufactured slope revegetation areas), these areas will be monitored and managed with an adaptive approach. If in Year Three, the areas are not meeting the Year Three performance criteria, remedial seeding or the installation of an irrigation system may be required on the recommendation of the Project Biologist/Restoration Specialist.

Table 27
Performance Criteria for CSS Revegetation Areas

Year	Grassland Establishment and Restoration Areas	
	Percent Native Scrub Cover*	Percent Non-Native Cover ¹
3	20-30%	25%
5	50-70%	15%

Notes:

Percent Cover = total percentage of cover from designated criteria. Bare ground is assumed to cover remaining areas.

¹ = This is an annual maximum value (note that no invasive/exotic species cover is allowed in any year).

* Percentage value based on visual estimates.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

6.0 MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD

Because the goal of the maintenance and monitoring period is to establish natural vegetation communities that can be sustained with little or no maintenance, the primary effort of the maintenance proposed is concentrated in the first few seasons of plant growth. This period is crucial to prevent weeds from out-competing native plants. The intensity of the maintenance activity is expected to subside each year as the native plant materials become more established. As native plants in the mitigation and revegetation areas mature, local competition from non-native plants for resources in the mitigation and revegetation areas will be minimized through ongoing control of non-native plants.

6.1 Maintenance Activities

Maintenance activities will be conducted concurrently with the installation of the mulch, container plants, and hydroseed materials in all mitigation and revegetation areas. Maintenance activities will continue throughout the initial 120-day establishment period and the long-term maintenance and monitoring period, concluding once plant installation performance standards have been met. Contractor maintenance activities at all mitigation areas will be conducted monthly during the 120-day establishment period and Year 1, every other month for Year 2, and quarterly for Years 3 through 5. Contractor maintenance activities in the revegetation areas will be conducted monthly during the 120-day establishment period and Year 1, quarterly in Year 2, and biannually in Years 3 through 5.

6.2 Weed Control

Ongoing weed control activities will occur within the mitigation areas throughout the 5-year long-term maintenance period. Weed eradication will consist of the complete removal of selected non-native vegetation (i.e., seed heads, stems, roots), with all debris and slash generated from weed removal activities disposed of off site in a legally acceptable manner.

Target weed species include those on the California Invasive Plant Inventory (CAL-IPC 2013). Specific focus will be on those species that pose a risk to the development of the proposed vegetation communities. Appropriate measures for control will be determined based on current literature and known methods of control.

Weed control measures may include direct physical or mechanical removal (e.g., cutting with weed whip machines, mowing) and herbicide application. Weeding will be performed as recommended by the Project Biologist to keep weeds establishing on the mitigation site at manageable levels. Specified weed species will be controlled before seed-set (other species that appear may be added to this list if deemed necessary by the Project Biologist).

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Non-native grasses in the mitigation areas will be controlled within the project boundaries during the long-term monitoring period, but complete eradication may not be possible due to the ubiquitous nature of their distribution within the area. Non-native grasses will be minimally controlled in the annual grassland mitigation areas. Herbicidal control in all mitigation and revegetation areas (excluding vernal pool/seasonal wetland mitigation areas) will be used for persistent plant species as specified by the Project Biologist, as well as any additional perennial species that are low growing and are difficult to control by other methods. The maintenance contractor should coordinate with the Project Biologist and the client to identify specific sites where chemical herbicide may be used. Any herbicide treatment must be specified by a licensed pest control advisor and applied by a licensed pest control applicator.

6.3 Trash Removal

Trash will be removed from all mitigation and revegetation areas during maintenance visits. Trash consists of all man-made materials, equipment, or debris dumped, thrown, washed, blown, or left within the mitigation areas. Trash and inorganic debris washed or blown onto the mitigation site will be removed regularly. Deadwood and leaf litter of native trees and shrubs will not be removed. Downed logs and leaf litter provide valuable micro-habitats for invertebrates, reptiles, small mammals, and birds. In addition, the decomposition of deadwood and leaf litter is essential for the replenishment of soil nutrients and minerals.

6.4 Irrigation Maintenance

Specified mitigation areas will be irrigated to promote plant survival during the drier parts of the year, primarily the summer months. Irrigation may be used in winter months to simulate an average or above-average rain season if natural precipitation is lacking. Irrigation will last for a maximum of 3 years, with the exception of adaptive management needs. Irrigation volume will be gradually reduced over time to acclimate plants to a non-irrigated condition prior to complete cessation of irrigation. Irrigation from June to November may be minimized to allow plants to experience normal drought cycles and to promote appropriate root growth. The Restoration/Maintenance Contractor will maintain the irrigation system at the optimum level of operation.

Consultation with the Project Biologist will be necessary to determine the timing for the cessation of irrigation. Irrigation should stop at the earliest possible date without risking significant loss of plantings. It is expected that the irrigation system will be abandoned no earlier than the end of Year Two. Irrigation will be discontinued no later than the end of Year Three of the 5-year monitoring and maintenance period. Irrigation components, such as valves and sprinkler heads, may be salvaged for re-use elsewhere at the end of the long-term maintenance period. If irrigation is deemed necessary beyond Year Three, adaptive management methods will be necessary to bring the project into conformance with performance standards.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

7.0 MONITORING PERIOD

7.1 Construction and Installation Monitoring

The Project Biologist will make regular site visits during the Mitigation Project installation. The Project Biologist also will review activities for conformance to the HCCMP, environmental permit conditions, and the requirements of contract plans and specifications. Each site observation visit will be documented in an observation report. Photo-documentation of site conditions will be conducted, as needed, during construction and installation monitoring.

7.2 120-Day Plant Establishment Period

Upon successful completion of project installation as determined by the Project Biologist, the 5-year long-term monitoring phase will begin at the terminus of the 120-day plant establishment period. During the first 120 days of the long-term monitoring period, container plants in all the mitigation areas will be monitored for health and vigor. Should any of the container plants die during the 120-day plant establishment period, they will be replaced in-kind at the expense of the Restoration Contractor to 100% the original quantities, at the recommendation of the Project Biologist. Should hydroseed fail to germinate within the 120-day plant establishment period in the mitigation and revegetation areas, it will be reapplied at the expense of the Restoration Contractor, at the recommendation of the Project Biologist. Monitoring will occur monthly (every 30 days) during the 120-day plant establishment period by the Project Biologist, who will make recommendations to the Restoration Contractor to ensure conformance with the 120-day plant establishment requirements.

7.3 Monitoring Methods

After each site visit, a site observation report will be prepared. The site observation report will include a description of the project status, site conditions, and any maintenance recommendations or remedial actions.

Monitoring of the mitigation and revegetation areas will be performed by the Project Biologist during the 120-day establishment period and regularly throughout the duration of the project. Both horticultural (qualitative) monitoring and biological (quantitative) monitoring will be conducted in the mitigation areas only. On an annual basis, the Project Biologist will provide a complete summary of results of the monitoring activities completed in the prior year period. The first annual monitoring report and all subsequent annual reports will be submitted on the anniversary of the month following completion of mitigation construction and installation. A preliminary monitoring schedule is shown in Table 28.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

Table 28
Mitigation Area Monitoring Site Visit Schedule

Year	Monitoring Frequency	Annual Report Submittal Schedule
1	Monthly	Submitted within 2 months following the anniversary of the completion of mitigation construction and installation.
2	Every other month	Same as above
3	Quarterly	Same as above
4	Quarterly	Same as above
5	Quarterly	Same as above

In the CSS revegetation areas, monitoring will be conducted monthly within the 120-day Plant Establishment Period and Year One, quarterly in Year Two and Three, and biannually in Years 4-5 (Table 29).

Table 29
CSS Revegetation Area Monitoring Site Visit Schedule

Year	Monitoring Frequency	Annual Report Submittal Schedule
1	Monthly	Submitted within 2 months following the anniversary of the completion of mitigation construction and installation.
2	Quarterly	Same as above
3	Quarterly	Same as above
4	Biannually	Same as above
5	Biannually	Same as above

7.4 Qualitative Monitoring

Data regarding native vegetation coverage, weed presence, maintenance activities and erosion, wildlife use, and site progress will be collected during monitoring visits to be used in the annual monitoring report. Qualitative monitoring will be conducted to assess native container plant vigor and development, seedling recruitment from native hydroseed and natural sources, soil moisture content, presence/absence of plant pests or diseases, erosion and/or drainage conditions, presence/absence of non-native or invasive plant species, trash or debris accumulation, wildlife presence/absence, project fencing, and general site conditions. All qualitative monitoring visits to the mitigation and revegetation areas will be documented with a monitoring report, which will be forwarded to the client. Any project deficiencies will be noted in the monitoring report, with accompanying recommendations for maintenance or remedial actions.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

7.5 Quantitative Monitoring

Quantitative monitoring will be conducted in the mitigation areas only to determine container plant survivorship/mortality, total native species cover and composition, total non-native species cover and composition, and height of vegetation (in the PNGG establishment and restoration areas). These data will be used to determine the percentage for native cover, species diversity, and non-native cover and will help determine the status of the mitigation areas with regard to their respective performance standards.

Quantitative monitoring will be conducted by establishing permanent vegetation transects within the mitigation areas at random locations at the end of Year One. These transects will be utilized to help determine achievement of the yearly performance standards and compliance with agency standards, and a permanent photo-documentation station will be established along each transect to record the progress of the mitigation site and graphically record plant establishment over the 5-year period.

Transects will be sampled using the point-intercept method (Canfield 1941, adapted by California Native Plant Society (CNPS) 2001). A transect tape will be run between two posts, and a vegetative intercept line will be visually projected above and below the tape at every 0.5-meter mark. Transects will be 25 meters long or the maximum length possible in areas with less than 25 linear meters available. Transect locations will be established by the Project Biologist. Each herb, shrub, or tree that intercepts the projected line will be recorded by species. In addition, all plant species present within the 5-meter-wide “species richness” zone will be recorded. All data will be utilized to determine total percent plant cover, percent native cover, percent non-native cover, overall species richness and diversity, and target species growth. Quantitative monitoring will be conducted once annually in the summer or fall beginning in Year Three and extending through Year Five of the Mitigation Project.

In the vernal pool/seasonal wetlands mitigation areas, quadrat sampling will be used to measure the cover and composition of plant species within the established, enhanced and restored vernal pools. One meter square will be placed at random within each pool. Percent cover of species present within the quadrat will be visually assessed and recorded. In addition, a cumulative plant species list shall be recorded once annually from each basin during the data collection site visit.

7.6 Wildlife Monitoring

A general wildlife survey will be conducted in the spring of each year of the monitoring period, concentrating on the wetland, riparian and scrub mitigation areas. These general wildlife surveys

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

should take approximately two days each year. Additionally, USFWS requires that eight weekly surveys for the flycatcher and vireo be conducted in the mitigation areas during the breeding season using consistent methodology from year to year. Although no performance criteria for wildlife use are specified for any of the habitat types, the results of the wildlife surveys (including species observed, number of individuals, and breeding status where appropriate) will be documented in the annual reports and used to assess trends in the mitigation areas. Avian or other special status wildlife species using the mitigation areas can be taken as a sign that the habitats are ecologically functional and this may supersede the vegetative performance standards, with agreement by USFWS, CCC, ACOE, RWQCB, and CDFW.

7.7 Adaptive Management

Adaptive management will be implemented during the 5-year monitoring period to respond to unforeseen or probable but unpredictable circumstances. Adaptive management is defined, for the purposes of the HCCMP, as a flexible, iterative approach to the long-term management of biological resources that is directed over time by the results of ongoing monitoring activities and direct observation of environmental stressors that are producing adverse results within the mitigation and revegetation areas. Adaptive management will include the utilization of regular qualitative assessments data gathered in the field prior to and during the Mitigation Project to assess the health and vigor of vegetation communities within the mitigation and revegetation sites. Following an event that causes damage to all or parts of these areas, the data will be used in part to drive management considerations for repair of the damaged areas. Achieving the key goals of mitigation completion and establishment of self-sustaining native vegetation communities will be the focus of all adaptive management decisions. Individual environmental stressors are discussed below along with an anticipated range of management responses to correct any damage that may occur to the mitigation sites.

7.7.1 Flooding

Flooding is an integral component of riparian, wetland and potentially vernal pool/seasonal wetland communities and is required to prevent conversion to a less desirable plant community. However, if flooding is excessive within these mitigation areas, an overall reduction in plant cover may occur. An increase or decrease in the size and frequency of flooding events is not expected to occur as a result of implementing the Mitigation Project. However, if monitoring of the riparian, wetland and vernal pool/seasonal wetlands mitigation sites indicates that cover is being reduced below tolerable levels by flooding, remedial planting or seeding using species that are adapted to weather conditions may be required. Additional cuttings or container plants may be placed in strategic areas to address these issues.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

7.7.2 Drought

Seasonal drought is a normal annual cycle in Orange County, and all plant palettes have been designed with drought-tolerant plant species that are capable of withstanding seasonal fluctuations in available moisture. However, an extended drought could potentially occur including low seasonal rainfall and prolonged high temperatures that may negatively affect the mitigation and revegetation areas (e.g., lower native cover, higher plant mortality, increased potential for pest infestations on site). Irrigation will reduce or eliminate the effects of drought on container plants and seedlings during the first three years of the Mitigation Project. Any remedial options that may be necessary after three years from the installation date will likely require an additional period of site irrigation to relieve plants from drought stress and/or provide for new seed growth. Irrigation components will be left in place after Year Three in case remedial seeding and/or container planting are required at a later date. If the irrigation system is required at a later date, it should be used only as necessary (i.e., periodic watering versus regular daily watering).

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

8.0 REPORTING

8.1 Annual Monitoring Reports

Annual monitoring reports will be submitted to the Permitting Agencies during the 5-year maintenance and monitoring period of the project. Annual reports outlining the results of the vegetation community monitoring will be submitted within two months of the anniversary of the conclusion of construction. The monitoring reports will describe the existing conditions of the project areas derived from qualitative field observations and quantitative vegetation data collection, if applicable. The reports will provide a comparison of annual performance standards with field conditions, identify all shortcomings of the project and project implementation, and recommend remedial measures necessary for the successful completion of the Mitigation Project. Each yearly report will provide a summary of the accumulated data. Annual reports also will include the following:

- Prints of biological monitoring photographs
- Maps identifying monitoring areas, planting zones, and weed removal areas, as appropriate
- Quantitative data from transect measurements in Years Three through Five of the Mitigation Project.

8.2 Agency Notification at End of Monitoring Period

The client will notify the Permitting Agencies upon submitting the annual report for the final year that the final performance standards have been met at the end of the 5-year monitoring period and request acceptance of the site and release from the permit conditions. Removal of the irrigation system, temporary fencing, and signage would occur prior to final sign-off.

8.3 Regulatory Agency Conformation

Following receipt of the notification of completion, the Permitting Agencies may visit the site to confirm the completion of the Mitigation Project and will issue formal letters of success prior to acceptance.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

9.0 CONTINGENCY MEASURES

If performance standards are not met for any portion of the Mitigation Project or if the final performance standards are not met, the Project Biologist will prepare an analysis of the cause(s) of failure within the appropriate annual report and, if determined necessary by Permitting Agencies, propose remedial action for agency approval. If mitigation sites do not meet performance standards by the end of the 5-year long-term maintenance and monitoring period, NBR's maintenance and monitoring obligations will continue until contingency measures are negotiated and implemented to bring the mitigation sites into compliance with the established standards or until the Permitting Agencies grant final mitigation project permit compliance/approval.

Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

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Habitat Conservation and Conceptual Mitigation Plan for the Newport Banning Ranch Property

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