

SECTION 1. OVERVIEW OF RESTORATION PROGRAM

PROJECT DESCRIPTION and SUMMARY

The Project Site is currently, and has historically been, used for oil extraction. The project consists of a phased development including at least 50-percent of the site preserved as open space, a residential village, commercial development, a coastal inn, and local and community park uses on an approximately 400-acre site. In total, approximately 130 acres are proposed for residential and commercial development. The project will also provide approximately 270 acres of open space uses including habitat preservation and restoration, public access trails around preserved wetland habitat and the vernal pool complex, and a community park.

A. Location of Project

The Newport Banning Ranch property covers approximately 400 acres and is located in unincorporated Orange County and the City of Newport Beach (City) [Exhibit 1]. The Site is 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 [Exhibit 2]. No blue-line drainages occur on site; however, one tidal channel occurs near the southwest corner of the site as depicted on the U.S. Geological Survey (USGS) topographic map Newport Beach, California [dated 1965 and photorevised in 1981]. The Site is situated within un-sectioned areas of Township 6 South and Range 10 West. The project footprint and open spaces are depicted on Exhibit 3.

B. Responsible Parties

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C. Overview of Habitat Restoration Program

The proposed project will result in significant impacts to wetlands, riparian habitat, raptor foraging habitat, and very limited areas of maritime succulent scrub (MSS) and alkali meadow

Environmentally Sensitive Habitat Area (ESHA) that will require mitigation in the form of on-site restoration and enhancement in conjunction with preservation/dedication of substantial areas of open space.

Compensatory mitigation for impacts to areas of ephemeral streambed and/or riparian habitat within Drainages B and C, subject to the jurisdiction of the U.S. Army Corps of Engineers (Corps), the California Department of Fish and Game (CDFG), and/or the California Coastal Commission (CCC) (see Section E-1 immediately below for breakdown by agency jurisdiction) includes restoration of 2.62² acres of ephemeral streambed/riparian habitat. Compensatory mitigation for impacts to 68.08 acres of non-native grassland that represent potentially suitable habitat for foraging raptors includes 13.65 acres of alkali meadow and 32.32 acres of native grassland. The proposed project will also result in impacts to 0.20 acre of alkali meadow adjacent to PCH subject to the jurisdiction of the Corps and CCC, which will be mitigated through the creation of 0.20 acres of alkali meadow immediately adjacent to the impact area and 0.40 acre of alkali meadow in the lowlands. Also included is an additional 2.87 acres of alkali mitigation in the lowlands to satisfy a deferred restoration obligation with the Regional Water Quality Control Board – Santa Ana Region.

The proposed project will also result in impacts to 4.13 acres of fragments of highly disturbed maritime succulent scrub, southern coastal bluff scrub (SCBS), and/or encelia scrub (ES) located throughout the site, as well as 0.06 acre of MSS ESHA associated with road construction adjacent to Drainage C. With the exception of the 0.06 acre of MSS ESHA associated with road construction, these scattered fragments of scrub are not part of ESHA on site, therefore mitigation is required for only the 0.06 acre ESHA scrub patch. Mitigation for impacts to 0.06 acre of MSS ESHA will consist of restoration of 0.18 acre of MSS. In addition, 7.42 acres of MSS and 4.75 of SCBS will be restored on-site as a Project Design Feature (PDF). Both of these vegetation associations provide suitable breeding habitat for coastal California gnatcatcher.

As a component of the proposed project, the vernal pool watershed will be enlarged and the entire pool complex will be restored. A portion of the eastern edge of the watershed area within San Diego fairy shrimp critical habitat as designated by US Fish and Wildlife Service (USFWS) will be impacted by the project, but the western edge of the existing watershed will be expanded with the watershed having a net gain of 0.68 acre. The entire watershed will be restored to alkali meadow habitat, and the vernal pools will be enhanced by removal of non-native species and native plants that are not characteristic vernal pool species. The watershed enhancement acreage will also provide mitigation for raptor foraging and is included in the 45.97 acres of raptor foraging mitigation.

Finally, the proposed project will include water quality basins planted with native emergent marsh and riparian species, and native buffer trees on the perimeter of the oil consolidation areas.

This plan includes four sections that address habitat restoration in lowland areas, habitat restoration in upland areas, and habitat restoration of the vernal pool complex on site. Through

² The 2.62-acre total consists of the areas in Drainages B and C that are currently vegetated with non-native invasive species such as Sydney golden wattle, pampas grass, myoporum, and giant reed.

implementation of this plan, the Project will be consistent with the City’s CLUP. Table 1-1 below provides an overview of mitigation and PDF acreage.

Table 1-1. Summary of Mitigation Habitat Types Proposed

TABLE 1-1 SUMMARY OF PROPOSED MITIGATION AND PROJECT DESIGN FEATURES		
Habitat	Type	Acres
Riparian/Wetland Drainages	Mitigation (Restoration)	2.62
Alkali Meadow for Wetland Impacts	Mitigation (Creation/Restoration)	0.60
Alkali meadow for raptor foraging (includes vernal pool complex)	Mitigation (Creation/Restoration)	13.65
Upland grassland for raptor foraging	Mitigation (Creation/Restoration)	32.32
Maritime succulent scrub	Mitigation (Restoration)	0.18
Maritime succulent scrub	PDF (Restoration)	7.42
Coastal bluff scrub	PDF (Restoration)	4.75
Total		61.49

D. Overview of Open Space Dedication Program and Future Mitigation Banking Opportunities³

Following receipt of all required agency permits and approvals required for the project, Irrevocable Offers of Dedication shall be recorded to the City of Newport Beach, County of Orange, State or Federal agency/entity, or qualified non-profit organization for up to 278 acres of Lowland and Upland Open Space, some of which is to be restored as set forth by this Habitat Restoration Plan, and the remainder of which would be available for future restoration and mitigation banking. In addition, approximately 19 acres of land designated for consolidated oil facilities operations will be deed restricted for open space use at the cessation of oil operations, and could potentially be available for future mitigation banking.

The Landowner/Master Developer has also included, within the Project, the reservation of approximately 76 acres exclusive of public interpretive trails within the Lowland that could be owned by a public agency or qualified non-profit organization and either restored with Local, State, and/or Federal Funds, and/or operated as a third-party mitigation bank.

³ For a more detailed discussion of the open space dedication please refer to the Technical Appendix entitled *Open Space Clean-up, Improvement, and Dedication Program*.

E. Impacts and Areas to be Restored for Mitigation by Habitat Type

1. Corps, CDFG, and CCC Wetlands/Riparian to be Restored

Corps Jurisdiction

The Project will impact a total of 0.33 acre of Corps jurisdictional waters, of which 0.20 acre consists of jurisdictional wetlands. Compensatory mitigation for impacts to jurisdictional waters, including 0.10 acre of temporary impacts in Drainage B and 0.03 acre of permanent impacts in Drainage C, will consist of restoration within Drainages B and C, and will total 2.62 acres (ratio of 30:1). Compensatory mitigation for 0.20 acre of permanent impacts to the alkali meadow at PCH will consist of the creation of 0.20 acre of alkali meadow contiguous with the impact area, and 0.40 acre of alkali meadow in the lowlands (contiguous with the alkali meadow raptor foraging mitigation area). The locations of proposed mitigation areas are depicted on Exhibit 4.

CDFG Jurisdiction

The Project will impact a total of 1.61 acres of CDFG jurisdiction, of which 1.53 acre consists of vegetated riparian habitat, including temporary impacts to 1.10 acre within Drainage B for restoration, 0.33-acre of permanent impacts within Drainage C, and 0.18 acre of permanent impacts to Feature D. Compensatory mitigation for impacts to jurisdictional riparian areas will consist of riparian restoration within Drainages B and C and will total 2.62 acres (ratio of 1.1:1). The location of proposed mitigation areas is depicted on Exhibit 4.

CCC Jurisdiction

The Project will impact a total of 1.10 acres of wetland and riparian habitat areas as defined by the Coastal Act, of which 0.51 acres consist of temporary impacts for restoration of Drainage B, 0.05 acre is SWS ESHA to be impacted for construction of an access road, 0.34 acre is non-ESHA SWS associated with Drainage C to be impacted for an access road and water quality basins, and 0.20 acre of alkali meadow at PCH. Compensatory mitigation for impacts to riparian areas on the site, including 0.05-acre of SWS ESHA, will be created within Drainages B and C and will total 2.62 acres. Compensatory mitigation for 0.20 acre of permanent impacts to the alkali meadow at PCH will consist of the creation of 0.20 acre of alkali meadow adjacent to the impact area and 0.40 acre of alkali meadow in the lowlands (contiguous with the alkali meadow raptor foraging mitigation area). The locations of proposed mitigation areas on site are depicted on Exhibit 4.

2. Raptor Foraging Habitat

A total of 68.08 acres of potentially suitable raptor foraging habitat will be impacted by the project. In accordance with recommendations by CDFG and the CCC, which typically require a mitigation ratio of 0.5:1 for impacts to non-native grassland, the impacted foraging habitat will be mitigated through restoration of 45.97 acres (ratio of 0.7:1) of grassland and alkali meadow foraging habitat within both the upland and lowland portions of the site. The locations of the mitigation areas on site were specifically chosen in order to enhance habitat value and connectivity at both the local and regional scale. Exhibit 4 depicts the location of raptor foraging habitat proposed for mitigation.

3. Maritime Succulent Scrub (MSS) and Southern Coastal Bluff Scrub (SCBS)

No direct impacts to occupied coastal California gnatcatcher habitat or those areas of MSS/ES/CSS that have been designated as potential ESHA are proposed for the project with the exception of 0.06 acre associated with road construction adjacent to Drainage C. Mitigation for impacts to 0.06 acre of ESHA MSS will consist of the restoration of 0.18 acre of MSS. In addition, the project will restore 7.42 acres of MSS and 4.75 acres of SCBS in select areas throughout the property as a Project Design Feature (PDF), resulting in a net gain of scrub cover types suitable for breeding coastal California gnatcatchers on site. Exhibit 4 depicts the location of proposed MSS and SCBS restoration.

4. Vernal Pool Complex

As a component of the proposed project, the vernal pool watershed will be enlarged and the entire pool complex will be restored. A 0.32-acre portion of the eastern edge of the watershed area within San Diego fairy shrimp critical habitat as designated by US Fish and Wildlife Service (USFWS) will be impacted by the project, but the western edge of the existing watershed will be expanded by 1.03 acres, with the watershed having a net gain of 0.68 acre. The expanded 2.91-acre watershed will be restored to alkali meadow habitat, and the vernal pools will be enhanced by removal of non-native species and native plants that are not characteristic vernal pool species. The watershed enhancement acreage will also provide mitigation for raptor foraging and is included in the 45.97 acres of raptor foraging mitigation. Exhibit 4 depicts the location of proposed vernal pool complex restoration.

F. Type(s), Functions, and Values of the Areas to be Restored

All of the areas that are to be restored currently support either all non-native species or a mixture of predominantly non-native species and some natives with limited value to native wildlife. Some areas are completely dominated by non-native invasive species. For example, the riparian restoration site within the Middle Arroyo/Drainage B, which is to be preserved and restored, supports a significant amount of pampas grass (*Cortaderia selloana*), giant reed (*Arundo donax*), Brazilian pepper (*Schinus molle*), and Sydney golden wattle (*Acacia longifolia*). These species are detrimental to native habitats as they can easily outcompete native vegetation, creating large areas that have little if any value to native wildlife. The lowland areas on site that represent suitable foraging habitat for raptors and are to be restored and preserved include ruderal areas that are dominated by poison hemlock (*Conium maculatum*) and five-hook bassia (*Bassia hyssopifolia*). The upland areas on site that represent suitable foraging habitat for raptors and are to be restored and preserved are substantially disturbed and support a mixture of native and non-native vegetation.

G. Implementation Schedule

The mitigation and restoration program will be implemented concurrent with the construction of the development portions of the project. Site preparation will occur during grading of the development areas, and planting will be implemented during the appropriate planting period. The Project Biologist will supervise and provide biological monitoring during project construction, site preparation, installation of plant materials, and maintenance.

SECTION 2. RIPARIAN & ALKALI MEADOW RAPTOR FORAGING

I. GOAL of RESTORATION: Riparian and Lowland Alkali Meadow

As noted in Section 1, the project will have limited albeit significant impacts to areas subject to the jurisdiction of the Corps, CDFG, and CCC, which are associated with restoration of Drainage B (Middle Arroyo) that is highly degraded by woody non-native invasive species including Sydney golden wattle, Brazilian pepper, giant reed, and pampas grass. Additionally, the project will impact Drainage C for an access road (totaling 0.05 acre of SWS ESHA) and water quality features (totaling 0.34 acre of non-ESHA SWS), as well as the alkali meadow wetland at Pacific Coast Highway for a major access road. A total of 2.62 acres of riparian habitat dominated by southern willow scrub will be restored in Drainages B and C, 0.20 acre of alkali meadow will be created adjacent to the PCH impact area, and 0.40 acre of alkali meadow will be restored in the lowlands to mitigate for impacts to the PCH alkali meadow.

Impacts to 68.08 acres of non-native grassland that represents suitable raptor foraging habitat will be partially mitigated through creation of 13.65 acres of alkali meadow in the vernal pool complex and lowland portions of the site that are currently occupied by roads, pads, or non-native invasive plants including poison hemlock and five-hook bassia (additional raptor foraging habitat mitigation addressed in Section 3 will ensure full mitigation for grassland/raptor foraging impacts). During focused biological surveys on the site, raptor foraging was generally concentrated in the lowlands, making restoration of the lowlands particularly important in compensating for losses in the upland portions of the site.

This section (i.e., Section 2) addresses restoration of 2.62 acres of riparian habitat for mitigation, creation of 0.60 acre of lowland alkali meadow to mitigate for wetland impacts, and restoration of 13.65 acres of alkali meadow for raptor foraging mitigation. The vernal pool restoration acreage is included in the 13.65 acres of alkali meadow restoration for raptor foraging but is addressed in detail in Section 4, as the plant palette and restoration methodology differs from the lowland alkali meadow restoration.

A. Type(s) of Habitat to be Restored for Mitigation

As noted above, the riparian restoration within Drainages B and C will consist of southern willow scrub, and the lowland meadow restoration areas will consist of alkali meadow dominated by saltgrass (*Distichlis spicata*), alkali rye (*Leymus triticoides*), and alkali sacaton (*Sporobolus airoides*).

B. Time Lapse

Grading in Drainages B and C necessary to remove the non-native invasive species will occur in advance of or concurrently with grading associated with development areas. Shaping and planting of the channel will occur immediately following removal of the non-native invasive species.

Implementation of the lowland alkali meadow restoration will begin concurrent with project grading associated with the development component of the project.

II. FINAL SUCCESS CRITERIA

A. Target Functions and Values

Restoration efforts will increase biological productivity of the preserved open space and provide enhanced habitat for wildlife in the riparian and lowland alkali meadow habitats.

Specifically, restoration of southern willow scrub in Drainages B and C will provide habitat for a variety of common riparian-dependent avian species and special-status species such as least Bell's vireo (*Vireo bellii pusillus*), yellow warbler (*Dendroica petechia*), and yellow-breasted chat (*Icteria virens*). The riparian wetland will also provide nesting habitat for raptors such as Cooper's hawk (*Accipiter cooperi*), which currently nests in riparian habitat in the lowland.

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 (*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, 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.

B. Target Acreages for Riparian and Alkali Meadow

A total of 2.62 acres of riparian habitat will be restored for mitigation within preserved open space areas, 0.60 acre of alkali meadow will be restored as mitigation for impacts to the PCH alkali meadow, and 13.65 acres of lowland alkali meadow will be restored as mitigation for raptor foraging habitat within preserved open space areas.

III. PROPOSED RESTORATION SITES

A. Location and Size of Mitigation Areas

The 2.62 acres of riparian habitat will be restored for mitigation in Drainages B and C to provide native riparian habitat and a connected riparian corridor.

The 0.40 acre of lowland alkali meadow mitigation for wetland impacts will be restored on the north end of the property surrounding areas of existing alkali meadow to provide a continuous patch of alkali meadow habitat. This habitat will be connected to upland needlegrass grassland habitat in

the north-east corner of the property and to open space areas north of the property, including Talbert Regional Park. The remaining 0.20 acre of lowland alkali meadow mitigation for impacts to the PCH alkali meadow will be created adjacent to the impact area.

The alkali meadow and riparian restoration areas are depicted on Exhibit 4.

B. Ownership Status

The property is currently owned by Newport Banning Ranch LLC, who is also the Applicant.

C. Present and Proposed Uses of Mitigation Areas

The restoration sites are presently subject to oil field operations, providing limited value to wildlife. If left undisturbed, the proposed riparian and lowland alkali meadow restoration areas would continue to function as limited wildlife habitat. Upon completion of the riparian and lowland alkali meadow restoration program, the mitigation areas will provide enhanced wildlife habitat functions to riparian-dependent birds and foraging raptors, including nesting and foraging short-eared owls.

To ensure permanent protection of the restoration areas, the applicant will record a restrictive covenant in the form of a conservation easement and/or deed restriction that will prevent development of the areas proposed for restoration.

D. Present and Proposed Uses of All Adjacent Areas

The surrounding land uses for the riparian areas associated with the Middle Arroyo and Large Arroyo are open space with the exception of existing residential development at the eastern boundary. The lowland restoration area is and will be completely surrounded by open space.

IV. IMPLEMENTATION PLAN

A. Rationale for Expecting Implementation Success

The mitigation program will be implemented in advance of or concurrently with impacts to riparian and alkali meadow habitats. The specific rationale for expecting success in the implementation of the components of the mitigation program is provided below.

Riparian Habitat

The proposed riparian habitat mitigation sites are a good candidate for habitat establishment and will result in an increase in habitat function within the open space for several reasons. First, native riparian vegetation in the three arroyos including Drainages B and C indicate that the hydrological conditions are conducive to establishing riparian wetland species in Drainages B and C. Second, the proposed plant palettes consist of species that occur on site and are known to perform well in local riparian habitat restoration programs. Third, the mitigation site is in close

proximity to existing riparian habitat in the lowlands that has been occupied by riparian-dependent avian species including least Bell's vireo, yellow warbler, and yellow-breasted chat over the survey period. Finally, a qualified habitat restoration specialist or other individual knowledgeable in native plant revegetation, hereinafter referred to as the Project Biologist, will supervise the implementation, maintenance, and five-year monitoring of the mitigation plan.

Lowland Alkali Meadow Mitigation for PCH Alkali Meadow

The proposed alkali meadow mitigation sites are good candidates for habitat establishment and will result in an increase in habitat function within the open space for several reasons. First, native alkali meadow habitat is present in adjacent areas on site, indicating that the environmental conditions, including hydrology, are conducive to establishing alkali meadow species in the lowland mitigation areas. Second, the proposed plant palettes consist of species that occur on-site and are known to perform well in habitat restoration programs. Third, a qualified habitat restoration specialist or other individual knowledgeable in native plant revegetation, hereinafter referred to as the Project Biologist, will supervise the implementation, maintenance, and five-year monitoring of the mitigation plan.

Lowland Alkali Meadow Raptor Foraging Habitat

The proposed alkali meadow mitigation sites are good candidates for habitat establishment and will result in an increase in habitat function within the open space for several reasons. First, native alkali meadow habitat is present in adjacent areas on site, indicating that the environmental conditions, including hydrology, are conducive to establishing alkali meadow species in the lowland mitigation areas. Second, the proposed plant palettes consist of species that occur on-site and are known to perform well in habitat restoration programs. Third, raptors have been observed during biological surveys foraging over the existing alkali meadow in the lowland that is adjacent to the mitigation sites. Finally, a qualified habitat restoration specialist or other individual knowledgeable in native plant revegetation, hereinafter referred to as the Project Biologist, will supervise the implementation, maintenance, and five-year monitoring of the mitigation plan.

B. Responsible Parties

The Applicant will be responsible for the implementation of the mitigation project.

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C. Site Preparation

Site preparation for Drainages B and C shall 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. To implement the riparian habitat restoration, Drainages B and C will be subject to removal of the high densities of non-native vegetation and then will be re-contoured, followed by planting.

Preparation of the alkali meadow areas will primarily be implementation of a grow-and-kill program to remove the monocultural stands of poison hemlock and other non-native species. Preparation may also include the use of heavy equipment to remove non-native trees such as myoporum. Restoration of these habitat types will be implemented during the appropriate planting period and will be performed in advance of or concurrently with grading of the development areas.

Ongoing Exotic Vegetation Control

The predominance of non-native, invasive weed species throughout California has presented a challenge to most native revegetation projects. Weedy species are opportunistic, rapidly colonizing disturbed sites such as revegetation sites. This can lead to the displacement of native species if the weedy species are not properly treated. Several of these invasive species are capable of out-competing most native understory and herbaceous plants; Pampas grass and giant reed can out-compete and even displace existing native vegetation as is evidenced by the dominance of these species in all of the arroyos and large portions of the lowland areas on the site.

One of the largest obstacles to the successful revegetation of a site is the exotic seed bank residing in the soil. This seed bank can persist for several years or even decades and poses one of the major threats to restoration programs. Undesirable exotic plants will be eradicated either during initial site grading or prior to site preparation. If grading precedes planting by more than a few months, it will be necessary to eradicate undesirable exotic plants that have become established prior to planting and seeding of the mitigation sites. If deemed necessary, a "grow-and-kill" cycle will be established during that period. "Grow and kill" is a cycle of applying water, germinating the non-native, invasive species, and spraying with the appropriate chemical. This allows a large portion of the seed bank currently present in the soil to be removed. Eliminating or substantially reducing the competition from non-native exotics early in the life cycle of native plants helps to ensure more rapid growth and cover by the native species.

When necessary, the initial eradication of pest plants shall be performed by hand, by the use of pesticides, or by other methods approved by the Project Biologist. Weed control will be

maintained throughout the monitoring period. Weeds will be controlled before their setting of seed. Ongoing weed control will be accomplished manually by the use of a hoe or other tool to uproot the entire plant, a mower or weed whip to cut plants, or by herbicide application. The type, quantity, and method of herbicide application will be determined by a California licensed Pest Control Advisor (PCA) who will inspect the site and write project recommendations and submit the recommendations to the Project Biologist for approval. Pesticide recommendations shall include, but are not limited to, the pesticides to be used, rates of application, methods of application, and areas to which pesticides are to be applied. A licensed Pest Control Operator (PCO) may work under the supervision of the PCA who will employ best management practices regarding the timing, quantity, and type of herbicide for each species. The PCA will determine both immediate and follow-up herbicide application for each species.

Weed species identified as invasive, particularly tenacious, or those with wind-borne seed will be subject to the earliest control efforts. The Project Biologist will direct the contractor regarding the selection of target weed species, their location, and the timing of weed control operations to ensure that native plants are avoided to the extent possible. A summary of weed removal methods are provided in Table 2-1.

**TABLE 2-1
ERADICATION METHODS FOR INVASIVE PLANTS**

Method	Application Method	Time	Equipment	Advantage	Disadvantage
Manual	-Best on isolated individual patches	-Remove late summer to early fall	-Shovel -Weed wacker -Loppers -Brush cutters	-No herbicide use -Low soil disturbance	-Low effectiveness -Resprouting likely to occur
Foliar Spray	-Small or moderate stands of pure invasive	-Spray late summer to early fall	-Sprayer (backpack or mounted) -Glyphosate Herbicide	-Low soil disturbance -Relatively effective	-Use of herbicide -Drift spray on non-target plants -Leave above ground biomass
Cut Stem/Stump Spray	-Large pure stands of invasive stands near or mixed with native vegetation	-Cut & Spray late summer to early fall	-Weed wacker -Loppers -Brush cutters -Wand applicator -Glyphosate Herbicide	-Reduction of overspray on non-target -Can remove above ground biomass	-Resprouting likely to occur -Cost of removing biomass off site if necessary
Cut, Resprout, & Spray	-Large pure stands of invasive	-Cut in spring - Spray resprouts late summer to early fall	-Weed wacker -Loppers -brush cutters -Sprayer (backpack or mounted) -Glyphosate Herbicide	-Reduction of overspray on non-target -Can remove above ground biomass	-Resprouting likely to occur -Cost of removing biomass off site if necessary
Mechanical	-Large pure stands of invasive	-Cut or mow canes outside of nesting season -Excavate in dry season	-Specialized excavator	-Root/ rhizome removal	-High soil disturbance -Some resprouting likely to occur if all roots are not removed

Contractor Education

All aspects of the Mitigation Plan concerning permit requirements, site protection, maintenance inspections, landscape procedures, and monitoring will be reviewed with the appropriate contractors prior to the commencement of grading or any construction work.

All contractors, subcontractors, and project supervisors will be notified of the Corps Authorization, CDFG Streambed Alteration Agreement, Regional Board Water Quality Certification, and Coastal Development Permit. Copies of the permits shall be kept on-site at all times during periods of active work and must be presented to any agency personnel upon demand.

D. Planting Plan

Riparian vegetation and lowland alkali meadow will be established within the proposed mitigation areas depicted on Exhibit 4.

The habitat components were selected based on surveys conducted during various biological survey visits including vegetation mapping, jurisdictional delineation, 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, and potentially, the southwestern willow flycatcher. The lowland alkali meadow components are conducive for supporting a variety of foraging raptors. No planting shall be done in any area until the area concerned has been prepared in accordance with the plans and presents an appearance satisfactory to the Project Biologist.

Plant Palette

The mitigation sites will be vegetated with plant species native to the Orange County coast including southern willow scrub and alkali or alkali meadow as described by the former Orange County Environmental Management Agency⁴, with additions from the associations described by Sawyer and Keeler-Wolf⁵ and modifications based on site-specific conditions. The proposed plant palettes for the mitigation and restoration habitat types are designated below in Tables 2-2 and 2-3. The plant palette includes recommendations for plant species composition based on other restoration programs. Plant quantities, spacing, stock type, and distribution shall be determined in consultation with the CDFG.

⁴ County of Orange Environmental Management Agency, Department of Planning. 1992. Habitat Classification System, Natural Resources Geographic Information System (GIS) project. By John Gray, Ph.D. and David Bramlet. Santa Ana, California

⁵ Sawyer, J. O., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, California; the approximately equivalent vegetation series for maritime succulent scrub is coast prickly-pear series in this manual, and the approximately equivalent vegetation series for southern coastal bluff scrub is California encelia series in this manual.

TABLE 2-2 RIPARIAN HABITAT PLANT PALETTE 2.62 ACRES	
Botanic Name	Common Name
Canopy and Shrub Species	
<i>Salix exigua</i>	Sandbar Willow
<i>Salix lasiolepis</i>	Arroyo Willow
<i>Salix laevigeta</i>	Red Willow
<i>Baccharis salicifolia</i>	Mulefat
<i>Baccharis douglasii</i>	Douglas' Baccharis
<i>Baccharis emoryi</i>	Emory's Baccharis
<i>Artemisia douglasiana</i>	Mugwort
<i>Rubus ursinus</i>	California blackberry
<i>Rosa Californica</i>	California rose
Herbaceous Understory	
<i>Frankenia salina</i>	Alkali Heath
<i>Distichlis spicata</i>	Saltgrass
<i>Heliotropum curassivicum</i>	Seaside Heliotrope
<i>Malvella leprosa</i>	Alkali sida
<i>Pluchea odorata</i>	Saltmarsh fleabane
<i>Epilobium ciliatum</i>	Willowherb
<i>Ambrosia psilostachya</i>	Western Ragweed

TABLE 2-3 LOWLAND ALKALI MEADOW PLANT PALETTE 13.65 ACRES RAPTOR FORAGING MITIGATION 0.60 ACRES WETLAND MITIGATION	
Botanic Name	Common Name
<i>Frankenia salina</i>	Alkali Heath
<i>Distichlis spicata</i>	Saltgrass
<i>Heliotropum curassivicum</i>	Seaside Heliotrope
<i>Juncus mexicanus</i>	Mexican Rush
<i>Pluchea odorata</i>	Saltmarsh fleabane
<i>Epilobium ciliatum</i>	Willowherb
<i>Sporobolus airoides</i>	Alkali Sacaton
<i>Leymus triticoides</i>	Alkali rye
<i>Cressa truxillensis</i>	Alkali weed
<i>Spergularia marina</i>	Saltmarsh sand spurrey

Source of Plant Materials

It is preferred that the source of all propagules and seed used at the mitigation and restoration sites be from the site or adjacent areas. If not available, the remainder of propagules and seed required will be from wild sources within Central Orange County and collected as close to the mitigation site as possible to preserve regional genetic integrity.

Contract Growing

Contract growing of all container plants shall be by a local experienced native plant nursery. Substitution of plant material at the time of planting depends solely upon the discretion of the Project Biologist. Any substitutions that are approved will be documented in the As-Built Plans.

Container Plants

One-gallon container stock, rosepots, and liners shall be utilized for container stock production in order to develop vertical heterogeneity (strata). All plant materials will be inspected by the Project Biologist and approved as healthy, disease free, and of proper size prior to planting. Overgrown, root-bound container stock will be rejected.

Mycorrhizal Fungi

Mycorrhizae are specialized fungi found on plant roots. A symbiotic relationship exists between plant roots and mycorrhizae wherein the plants benefit from the increased ability to take up nutrients and withstand drought when mycorrhizae are present. This relationship is essential to the growth rate, well-being, and longevity of native plant communities. Plant utilization of mycorrhizal fungi markedly increases the success of revegetation on disturbed or degraded lands. All appropriate container-grown plants, except those known to be non-host species, shall be inoculated with mycorrhizal fungi prior to delivery to the job site.

Plant Placement

Container stock will be laid out in such a manner that mimics natural plant distribution (i.e., in clusters and islands) to emulate regional reference sites. The Project Biologist will monitor and confirm that trees and shrubs have been placed at the designed elevation relative to the water source supporting them, such as ground water.

Planting Method for Rose Pot and/or Liner Plant Stock

Rose pot and/or liner plant stock will be placed in a hole measuring at least twice the diameter and depth of the container. The root structure will be examined and excess root material removed. The top of the rootball will be set slightly above finish grade. The planting hole will be backfilled with native soil. Fertilizer, watering basins, and mulch are not required for this planting method.

Planting Method for Container Stock

One-gallon container stock will be planted in a hole measuring at least twice the diameter of the container and twice the depth. Container stock will be thoroughly watered the day before planting. One teaspoon (0.3 oz.) of Osmocote 14-14-14 (or equal) will be placed one inch below the root zone and backfilled with native soil to proper planting depth. The container will be upended into the palm of the hand to avoid damage to the root structure and placed in the planting hole. The top of the root ball will be set one inch above finish grade. The planting hole will be backfilled with native soil.

A three-inch high, hand-compacted earth berm, approximately 36 inches in diameter, will then be constructed around each container plant. This watering basin will be maintained until the plants are no longer irrigated. Mulch will be applied as a top dressing, 2 to 3 inches thick, but must not

come in contact with the stem of the plant. Container stock will be watered immediately after installation.

Pruning and Staking

There will be no pruning or staking of any vegetation. Diseased or insect-damaged foliage, if sufficient to require pruning, will serve as a benchmark for rejection of plant material.

E. Irrigation Plan

Supplemental irrigation may be used solely for the purpose of establishing the plants at the mitigation and restoration sites and is of a temporary nature. The goal of the irrigation program is to obtain germination and growth with the least amount of irrigation. Frequent irrigation encourages weed invasion and leaches nutrients from the soil.

The mitigation and restoration sites will be initially supported by a short-term automatic irrigation system as well as from existing water sources. Drip irrigation may be provided for trees and shrubs planted on the slopes. The container stock will be irrigated as long as necessary to establish the root systems in the native soils, as directed by the Project Biologist. The main line will be installed below-grade. All lateral lines will be installed above-grade for ease of removal and inspection. Alternatively, lateral lines may be installed below-grade and abandoned in place after project conclusion.

The critical period for irrigation is during the first winter and early spring following planting. During this time, roots are not well established and an unseasonable drought can cause high mortality. During dry periods after plant installation, the Project Biologist and the maintenance contractor will regularly inspect soil moisture. Watering during the summer dry season will occur as frequently as required.

After the initial plant establishment period, water will be applied infrequently and only as required to prevent the mortality of plants and seedlings. The irrigation methods employed will attempt to mimic wet rainfall years by incorporating evenly spaced, infrequent, deep applications of water.

When the plantings are sufficiently established and no longer require supplemental irrigation, the Project Biologist shall notify the landscape contractor to remove all above-grade irrigation system components from the mitigation and restoration sites.

F. As-Built Conditions

Once the implementation of the mitigation and restoration sites has been completed, the Applicant will submit "As-Built" drawings to the City, Corps, CDFG, CCC and U.S. Fish and Wildlife Service (USFWS) within 45 days after completion of construction. The drawings will identify the date installation was completed and if there were any deviations from the approved mitigation plan.

V. MAINTENANCE DURING THE MONITORING PERIOD

A. Maintenance Activities

The purpose of this program is to ensure the success of the mitigation and restoration plantings. Maintenance will occur over the Monitoring Period. The Project Biologist will monitor all aspects of the revegetation in an effort to detect any problems at an early state. Potential problems could arise from irrigation failure, erosion, vandalism, competition from weeds and invasive species, and unacceptable levels of disease and predation.

These maintenance guidelines are specifically tailored for native plant establishment. The maintenance personnel will be fully informed regarding the habitat establishment program so they understand the goals of the effort and the maintenance requirements. A landscape contractor with experience and knowledge in native plant habitat restoration will supervise all maintenance personnel.

For a period of 120 days following completion of the planting installation, the initial landscape contractor will be responsible for the care of the plantings. The purpose of the 120-day establishment period is to ensure continuity between the installation of the plant material and its short-term maintenance. The contractor's presence during this period is proven to increase project success. The contractor will control the spread of weed species and identify any efforts necessary to ensure the health and survival of the plantings.

Following the 120-day establishment period the project will be evaluated for health of plant material, and if judged satisfactory by the Project Biologist, the establishment period will be considered concluded and the long-term habitat maintenance program will begin. A different landscape contractor may implement this period of maintenance; however, the Project Biologist will continue to review the project's success.

Damage to plants, irrigation systems, and other facilities occurring as a result of unusual weather or vandalism will be repaired or replaced as soon as practicable.

General Maintenance

The Contractor will perform the following tasks as general maintenance duties:

- Plant Inspection
- Weed control
- Irrigation water volume and frequency
- General maintenance of irrigation system
- Trash and debris removal
- Pest control
- Plant replacement

Plant Inspection

After initial planting, the Project Biologist will check the mitigation site on a monthly basis through the 18th month. The plants shall be inspected on a quarterly basis thereafter.

Weed Control

The mitigation site shall be maintained free of weeds during the monitoring period. Weed eradication will minimize competition that could prevent the establishment of native species. All maintenance personnel will be trained to distinguish weed species from native vegetation to ensure only weedy species are removed or sprayed with herbicide.

As weeds become evident, they should be immediately removed by hand or controlled with an appropriate herbicide as determined by a licensed Pest Control Advisor (PCA). Weed debris shall be removed from the project area as accumulated and disposed of as permitted by law.

Weeds shall be manually removed before they can attain a height of three-inches (3") at intervals of not more than 30 days for the first two years of the project. All portions of the plant will be removed, including the roots. The Project Biologist shall direct the contractor regarding the selection of target weed species, their location, and the timing of weed control operations to ensure that native plants are avoided to the extent possible. Pulled weeds will be placed on a "mantilla" or other type of tarp to prevent the seeds from coming in contact with the ground.

A cleared space, 18 inches from the base of the plant, will be maintained around each container plant to minimize competition from other plant species. Mulch, two-inches thick within the watering basin, will be maintained throughout the monitoring period. Leaf and branch drop, and organic debris of native species, shall be left in place.

Irrigation Water Volume and Frequency

The contractor shall be responsible for applying sufficient irrigation water to adequately establish new plant materials and germinate and establish the applied seed. Irrigation water shall be applied in such a way as to encourage deep root growth (periodic deep irrigation versus frequent light irrigation). The contractor will allow soil to dry down to approximately 50- to 60-percent of field capacity (in the top six or ten inches after germination and during seedling establishment) before the next irrigation cycle. Wetting of the full root zone and drying of the soil between irrigation events is essential to the maintenance of the plants and the promotion of a deep root zone that will support the vegetation in the years after establishment. Systems may need to be on for as long as six to eight hours at a time in order to get complete water penetration to the lower soil horizons to encourage deep root growth. A soil probe or shovel shall be used to directly examine soil moisture and rooting depth.

General Maintenance of Irrigation System

The contractor will be responsible for the regular maintenance and repair of all aspects of the irrigation system. Poorly functioning or non-functioning parts shall be replaced immediately so as to not endanger the plantings.

General system checks shall be conducted no less than weekly for the first month after installation to ensure the system is functioning correctly and monthly thereafter, except during periods when the irrigation system is not in operation as recommended by the Project Biologist.

Any erosion or slippage of soil caused by the contractor's inadequate maintenance or operation of irrigation facilities shall be repaired by the contractor at his/her expense.

Trash and Debris Removal

The mitigation site shall be well maintained in order to deter vandalism and dumping of trash. The contractor is responsible for avoiding impacts to plantings during trash removal activities. Contractor shall, during daily routine maintenance, manually remove weeds, litter, trash, and debris from the mitigation site and dispose of off-site as permitted by law. Dead limbs and tree fall shall be left in place in the revegetation areas.

Pest Control

Young trees and shrubs will be monitored for signs of disease, insect and/or predator damage, and treated as necessary. Badly damaged plants will be pruned to prevent spreading of the pestilence or replaced in kind if removed. Excessive foraging by predators may necessitate protective screening around plants and/or poison baiting of the predators. The Project Biologist will be consulted on any pest control measures to be implemented.

The contractor shall be responsible for maintaining a rodent-free project. All measures to eradicate rodents must be as directed by a licensed pest control consultant.

Plant Replacement

The installation contractor will be responsible for replacing all container stock plants terminally diseased or dead for 120 days after plant installation. The long-term maintenance contractor will thereafter replace all dead and/or declining plants in the winter months as recommended by the Project Biologist. Replacement plants shall be furnished and planted by the contractor at his/her expense.

Replacement plants shall conform to the species, size requirements, and spacing as specified for the plants being replaced. The replacement plants shall be purchased from inventory at the same native plant nursery as were the contract-grown plant stock.

Fertilization

If nutrient deficiencies are observed during site monitoring, the Project Biologist may specify applications of slow-release pellet fertilizer or soil amendments to speed initial growth or as a remedial measure. These applications shall occur at the onset of the rainy season following the manufacturer's recommendations. Fertilizer will not be applied other than under the direction of the Project Biologist.

Pruning

No pruning is necessary unless otherwise specified by the Project Biologist. Dead wood shall be left on trees or where it has fallen as it plays an important role in habitat creation and soil formation.

Staking of Trees

Staking of trees is to be avoided unless determined necessary by the Project Biologist. All stakes shall be removed at the completion of the five-year monitoring period, or earlier as determined by the Project Biologist. All stakes shall be removed by the contractor and disposed of off-site in a legal manner.

B. Responsible Parties

The Applicant will be responsible for financing and carrying out maintenance activities.

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C. Maintenance Schedule

The mitigation and restoration maintenance and monitoring program will begin with the construction process and continue during the Monitoring Period. Table 2-4 below indicates the schedule of maintenance inspections.

TABLE 2-4 MAINTENANCE SCHEDULE					
Maintenance Task	Year				
	1	2	3	4	5
Plant Inspection	Monthly first 12 months	Monthly through 18th month; quarterly thereafter	Quarterly	Quarterly	Quarterly
Irrigation System Inspection	Monthly or more frequently if required	Monthly	As Required	N/A	N/A
Trash and Debris Removal	Monthly	Quarterly	Quarterly	Quarterly	Quarterly
Weed Control	Minimum of Monthly	Monthly	Quarterly	Quarterly	Quarterly
Pest Control	Monthly	Bi-monthly	Quarterly	Quarterly	Quarterly
Plant Replacement	Annually	Annually	Annually	Annually	Annually
Fertilization (if necessary)	Annually	Annually	N/A	N/A	N/A

VI. MONITORING PLAN

A. Initial Monitoring Effort

The mitigation and restoration sites will be monitored immediately following establishment and 30 days thereafter. The initial biological and ecological status of the mitigation and restoration sites will be established and the as-built condition of the site will be documented. Long-term monitoring of the mitigation and restoration sites will begin following this initial assessment.

B. Performance Criteria

The success of habitat restoration is defined as the restoration of a functional ecosystem. Success is usually measured by percent coverage by target species. Natural habitats rarely exhibit 100-percent coverage but rather include a considerable proportion of open spaces. While this monitoring program uses percent coverage criteria, it is noted that determination of successful coverage is expected to be relative to other similar native habitats typical of the region. Undisturbed riparian wetland habitat and relatively undisturbed alkali meadow habitat is available on-site and will be used as references on site.

The means of determining successful enhancement for this site will be through series of measurements for species composition, exotic species cover, and cover by native species. All of these, except non-native species cover, should increase over time. Cover by non-native species should be the opposite; it should decrease with time, particularly because one of the primary goals of the project is to substantially reduce or eliminate non-native species from the restoration site. After the initial non-native species eradication and associated planting effort has been completed, the restoration site will be monitored by the project monitor on a monthly basis for the 12 months and quarterly for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization, will be completed during each monitoring visit. General observations, such as fitness and health of the planted species, pest problems, weed persistence/establishment, mortality, and drought stress, will be noted in each site walkover. The Project Monitor will determine remedial measures necessary to facilitate compliance with performance standards.

Data regarding wildlife usage will be collected during each visit.

Quantitative vegetation data will be collected annually using accepted vegetative sampling methods in order to evaluate survivorship, species coverage, and species composition.

In the event that plantings should fail to meet the specified requirements, compliance will be ensured by the performance of either or both of the following remedial procedures by the contractor on an as-needed basis as directed by the Project Monitor: (1) replacing unsuccessful plantings with appropriate-sized stock or seed mixes to meet stated cover or survival requirements and /or (2) performing maintenance procedures to ensure the site conditions are appropriate (e.g., non-native species removal). Remedial actions in planting areas shall be based on detailed investigations (such

as soil tests and excavations of failed plantings to examine root development) to determine causes of failure.

Standard Vegetation Monitoring procedures will be as follows:

First-Year Monitoring

Success Standard: 40-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 10-percent coverage by non-native shrubs species; and
No more than 20-percent coverage by non-native annual species

Second-Year Monitoring

Success Standard: 50-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 5-percent coverage by non-native shrubs species; and
No more than 15-percent coverage by non-native annual species

Third-Year Monitoring

Success Standard: 65-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrubs species; and
No more than 15-percent coverage by non-native annual species

Fourth-Year Monitoring

Success Standard: 75-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrub species; and
No more than 10-percent coverage by non-native annual species

Fifth-Year Monitoring

Success Standard: 80-percent coverage of native species, relative to the reference site (<5-percent deviation allowed); or utilized by nesting California gnatcatchers
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrub species; and

No more than 10-percent coverage by non-native annual species

C. Monitoring Methods

Monitoring will assess the attainment of annual and final success criteria and identify the need to implement contingency measures in the event of failure. Monitoring methods include an annual tally of dead and/or declining plant stock and visual estimates of cover as well as field sampling techniques that are based in accordance with the methodology developed by the California Native Plant Society (CNPS).⁶ Please refer to *A Manual of California Vegetation* for further details on this sampling method.

Sampling Techniques

Quantitative sampling within the restoration site will be performed using one-meter quadrats that will be placed randomly throughout the site. Placement of quadrats will be determined using random numbers tables to provide two coordinates – one that indicates the distance along a longitudinal centerline bisecting the site and one that determines the distance from the line. Plots will be placed on alternating sides of the centerline and perpendicular to the centerline.

Vegetative cover will be visually estimated within the quadrat for each species present and recorded on a data sheet. Any species observed during the sampling that does not fall within a quadrat will be recorded and included on the list of species for the restoration site. At least 30 replicates will be initially sampled. Sample variance from data collection in years one through three will be used to determine if 30 samples is adequate. If a power analysis indicates that more than 30 samples are required, additional transects or quadrats will be added. If power analysis indicates that fewer than 30 samples are required, the number of quadrats will be reduced. Sampling will be conducted with sufficient replication to detect a 10% difference in absolute ground cover between the mean of the restoration and the success standard with 90% power at an alpha level of 0.10. The mean native cover for the restoration site will be compared to the performance criteria at the end of five years using an appropriate inferential test such as a single-sample t-test. The mean cover for the restoration site will be considered to meet the performance criteria if the resulting alpha level is greater than 0.10.

Photo-Documentation

Permanent stations for photo-documentation will be established during the first annual monitoring event. Photos shall be taken each monitoring period from the same vantage point and in the same direction each year and shall reflect material discussed in the annual monitoring report.

Qualified habitat restoration specialists, biologists, or horticulturists with appropriate credentials and experience in native habitat restoration shall perform monitoring. Continuity within the personnel and methodology of monitoring shall be maintained insofar as possible to ensure comparable assessments.

⁶ Sawyer, John O. and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

Monitoring Period

The Monitoring Period shall last until whichever of the following occurs first: (a) five years from the installation of a mitigation site or (b) until the Project Biologist has determined, with resource agency concurrence, that the fifth-year success standard has been achieved for specific mitigation areas and, additionally, that such areas are self-sustaining in the absence of irrigation for a minimum of three years.

Qualitative Monitoring

The Project Biologist will conduct qualitative monitoring surveys on a monthly basis for the first 18 months and quarterly thereafter for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization, will be completed during each monitoring visit. General observations, such as fitness and health of the planted species, pest problems, weed establishment, mortality, and drought stress, will be noted in each site walkover. The Project Biologist will also note observations on wildlife use and native plant recruitment for the purpose of later discussion in the annual reports. Records will be kept of mortality and other problems such as insect damage, weed infestation, and soil loss. The Project Biologist will determine remedial measures necessary to facilitate compliance with performance standards.

D. Annual Reports

At the end of each of the growing seasons during the Monitoring Period an annual report will be prepared. These reports will be “cumulative” including the results from previous annual reports and will assess both attainment of yearly target criteria and progress toward final success criteria. These reports will include the following:

- a list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities for that year;
- an analysis of all qualitative monitoring data;
- copies of monitoring photographs;
- maps identifying monitoring areas, transects, and planting zones; and
- copies of previous reports

E. Schedule

Annual Reports will be submitted to the appropriate agencies by December 31 of each year for the year in which quantitative sampling was performed.

VII. COMPLETION OF MITIGATION

Upon completion of the Monitoring Period for the mitigation sites, the Applicant will notify the City, Corps, CDFG, CCC, and USFWS by submitting a Final Monitoring Report that documents this completion. Following receipt of the final report, the Applicant will, at the request of the City, Corps, CDFG, CCC, and USFWS, provide access and guidance through the mitigation and restoration sites to confirm the adequate completion of the mitigation.

VIII. CONTINGENCY MEASURES

A. Initiating Procedures

If a performance standard is not met for any mitigation site or sites in any year or if the approved success criteria are not met, the Project Biologist will prepare an analysis of the cause(s) of failure and, if determined necessary by the City, Corps, CDFG, CCC, and USFWS, propose remedial actions for approval. If any mitigation site has not met one or more of the success criteria or performance standards by the end of the Monitoring Period, the responsible party's maintenance and monitoring obligations shall continue until the above-referenced agencies each gives final approval that the mitigation obligations have been satisfied. It is therefore incumbent upon the Project Biologist to foresee project deficiencies as part of the monitoring program and take appropriate steps to address the situation.

B. Funding Mechanism

The Applicant will fund planning, implementation, maintenance, and monitoring of any contingency measures that may be required to achieve mitigation goals.

C. Responsible Parties

The Applicant will be responsible for implementing, maintaining, and monitoring any contingency procedures.

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SECTION 3. GRASSLAND RAPTOR FORAGING & SCRUB

I. GOAL of RESTORATION: Upland Grassland and MSS & SCBS

As noted in Section 1, impacts to non-native grassland that represents suitable raptor foraging habitat will be mitigated through creation of upland native needlegrass grasslands in portions of the site that are currently occupied by roads, pads, or non-native invasive plants (in conjunction with the alkali restoration described in Section 3). During focused biological surveys on the site, some raptor foraging was observed and two wintering burrowing owls (*Athene cunicularia*) were observed in upland non-native grassland areas⁷. No burrowing owls were observed during subsequent breeding season surveys.

As a Project Design Feature (PDF), restoration of 12.17 acres of MSS and SCBS will take place in upland areas that are currently disturbed and support non-native invasive plants including expansive areas of Hottentot fig (*Carpobrotus edulis*). An additional 0.18 acre of MSS will be restored in conjunction with the 12.17 acres to address impacts to 0.06 acre of MSS ESHA adjacent to the Large Arroyo/Drainage C, resulting in a combined 12.35 acres of MSS and SCBS.

This section addresses restoration of 32.32 acres of upland grassland for mitigation and restoration of 7.60 acres of MSS and 4.75 acres of SCBS.

A. Type(s) of Habitat to be Restored

As noted above, restoration of the upland grassland habitat mitigation within preserved areas will consist of native needlegrasses such as purple needlegrass (*Nassella pulchra*), foothill needlegrass (*Nassella lepida*) and Coast Range Melica (*Melica imperfecta*). In addition, upland grassland habitat will be created within a 50-foot wide buffer that is set back from the proposed development by a native fuel modification zone that is also predominately native grassland.

For the PDF, restored MSS habitat will consist of MSS dominated by California sunflower (*Encelia californica*) and bladderpod (*Isomeris arborea*) with intermittent large patches of cactus species (*Opuntia* spp.). Similarly, the proposed restoration of SCBS habitat as a PDF will be located on the west facing bluff depicted on Exhibit 4 and will consist of SCBS including California sunflower and the special status California box-thorn (*Lycium californicum*), cliff spurge (*Euphorbia misera*), woolly seablite (*Suaeda californica*), and wishbone bush (*Mirabilis californica*). This location is particularly suitable for these species because the topography and soils are similar to another bluff location immediately south that currently supports these same special status plant species (Exhibit 5).

⁷ An additional burrowing owl was also observed on an adjacent property during wintering owl surveys.

B. Time Lapse

Implementation of the upland grassland mitigation and MSS and SCBS restoration as a PDF will begin in advance of or concurrent with project grading associated with the development component of the project.

II. FINAL SUCCESS CRITERIA

A. Target Functions and Values

Restoration efforts will increase biological productivity of the preserved open space and provide enhanced habitat for wildlife in the upland needlegrass grassland and MSS and SCBS habitats.

The upland needlegrass grassland will provide foraging 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, Cooper's hawk, red-tailed hawk, northern harrier, Loggerhead shrike, Long-eared owl, American kestrel, ferruginous hawk, American peregrine falcon, and merlin. In addition, portions of the upland grassland will provide wintering habitat for burrowing owl (*Athene cunicularia*).

The MSS and SCBS will provide suitable habitat for a variety of avian species such as California towhee (*Pipilo crissalis*), Bewick's wren (*Thryomanes bewickii*), coastal California gnatcatcher (*Poliophtila californica*), coastal cactus wren (*Campylorhynchus brunneicapillus*), bushtit (*Psaltriparus minimus*), black phoebe (*Sayornis nigricans*), white-crowned sparrow (*Zonotrichia leucophrys*), wrentit (*Chamaea fasciata*), and yellow-rumped warbler (*Dendroica coronata*). The MSS will also provide cover for mammal species such as cottontail rabbit (*Sylvilagus auduboni*).

B. Target Acreages for Upland Needlegrass Grassland and MSS & SCBS

Upland grassland restoration for raptor foraging will total 32.32 acres and will be restored within preserved open space and areas of the 50-foot buffer zone adjacent to open space areas. A total of 0.18 acre of MSS will be created for mitigation of 0.06 acre of MSS ESHA in conjunction with 7.42 acres of MSS and 4.75 acres of SCBS that will be restored within open space areas as a PDF.

III. PROPOSED RESTORATION SITES

A. Location and Size of Mitigation and Project Design Feature Areas

The locations of the onsite habitat restoration areas were specifically chosen in order to enhance habitat value and connectivity at both the local and regional scale. The 32.32 acres of upland grassland habitat will be created and restored at various locations including the northeast corner of the property, select locations near Drainage C, and within the 50-foot buffer zone. The patch in the northeast corner of the property will provide a continuous patch of that will be connected to the

alkali meadow restoration areas and open space areas north of the property, including Talbert Regional Park.

The 7.60 acres of MSS habitat will be restored as a combination of mitigation (0.18 acre) and PDF (7.42 acres) within the north-central portion of the mesa with additional limited areas along the edge of Drainage C (the large arroyo) as indicated on Exhibit 4. In addition, 4.75 acres along the west-facing bluff overlooking Newport Shores will be restored as SCBS. All of the restored MSS and SCBS habitat will provide potential nesting and foraging habitat for the CAGN, as well as local and regional connectivity, which is critical for dispersal of CAGN.

B. Ownership Status

The property is currently owned by Newport Banning Ranch LLC, who is also the Applicant.

C. Present and Proposed Uses Mitigation and Project Design Feature Areas

The restoration sites are presently subject to oil field operations, providing limited value to wildlife. If left undisturbed, the proposed grassland and MSS and SCBS restoration areas would continue to function as limited wildlife habitat. Upon completion of the grassland restoration program, the mitigation areas and the PDF areas will provide enhanced wildlife habitat functions to scrub-associated birds including the coastal cactus wren and the coastal California gnatcatcher.

To ensure permanent protection of the restoration areas, the Applicant will record a restrictive covenant in the form of a conservation easement and/or deed restriction that will prevent development of the areas proposed for restoration.

D. Present and Proposed Uses of All Adjacent Areas

The surrounding land use includes developed areas. The restoration areas will generally be separated from developed land uses by a buffer of at least 100 feet that will include native fuel modification areas. Within this 100-foot buffer, a 50-foot “no-touch” buffer will extend from open space areas to the beginning of the 50-foot fuel modification zone and will include native needlegrass vegetation that is included in the raptor foraging habitat mitigation acreage. For those portions of the grassland within the 50-foot buffer, there will be a 50-foot setback from development from the fuel modification zone.

IV. IMPLEMENTATION PLAN

A. Rationale for Expecting Implementation Success

Compensatory mitigation will be implemented in advance of or concurrent with impacts to upland grassland habitats. Similarly, restoration as a PDF will be implemented in advance of or concurrently with impacts to non-ESHA MSS/ES vegetation. The specific rationale for expecting

success in the implementation of the various components of the mitigation program is provided below.

Upland Needlegrass Grassland Raptor Foraging Habitat

The proposed grassland mitigation sites are good candidates for habitat establishment and will result in an increase in habitat function within the open space for several reasons. First, native grassland vegetation in very limited areas and is presumed to have been more common on the site prior to disturbance indicating that the environmental conditions are conducive to establishing upland needlegrass grassland species in the mitigation sites. Second, the proposed plant palettes consist of species that occur on-site and are known to perform well in local needlegrass grassland habitat restoration programs. Finally, qualified habitat restoration specialist or other individual knowledgeable in native plant revegetation, hereinafter referred to as the Project Biologist, will supervise the implementation, maintenance, and five-year monitoring of the mitigation plan.

MSS and SCBS Habitat as a Project Design Feature

The MSS and SCBS PDF sites are good candidates for habitat establishment. First, existing patches of native MSS and SCBS near the proposed PDF sites indicate that the environmental conditions are conducive to establishing scrub species. Second, the proposed plant palettes consist of species that occur on-site and are known to perform well in nearby MSS and SCBS habitat restoration programs. Third, the PDF sites are in close proximity to existing MSS and SCBS habitat in the vicinity of Drainage C that has been consistently occupied by scrub birds including the coastal California gnatcatcher and coastal cactus wren over the survey period. Finally, a qualified habitat restoration specialist or other individual knowledgeable in native plant revegetation, hereinafter referred to as the Project Biologist, will supervise the implementation, maintenance, and five-year monitoring of the restoration plan.

B. Responsible Parties

The Applicant will be responsible for the implementation of the mitigation project.

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Plan Prepared by: Glenn Lukos Associates, Inc.
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29 Orchard
Lake Forest, California 92630-8300
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C. Site Preparation

Site preparation shall consist of excavation and grading, clearing and controlling exotic plants, trenching and installation of underground irrigation components, removing trash and debris, preparing planting holes, and doing any other work necessary to make ready the area for planting. In order to ensure that salvage of cactus occurs, prior to clearing, the project biologist will map and flag areas of cactus suitable for salvage. These areas will be preserved in place until salvage activities occur. Once salvage is begun, the salvaged cactus will be stored in protected areas on clean soil.

Exotic Vegetation Control

The predominance of non-native, invasive weed species throughout California has presented a challenge to most native revegetation projects. Weedy species are opportunistic, rapidly colonizing disturbed sites such as revegetation sites. This can lead to the displacement of native species if the weedy species are not properly treated. Several of these invasive species are capable of out-competing most native understory and herbaceous plants; Pampas grass and giant reed can out-compete and even displace existing native vegetation as is evidenced by the dominance of these species in all of the arroyos and large portions of the lowland areas on the site.

One of the largest obstacles to the successful revegetation of a site is the exotic seed bank residing in the soil. This seed bank can persist for several years or even decades and poses one of the major threats to restoration programs. Undesirable exotic plants will be eradicated either during initial site grading or prior to site preparation. If grading precedes planting by more than a few months, it will be necessary to eradicate undesirable exotic plants that have become established prior to planting and seeding of the mitigation sites. If deemed necessary, a "grow-and-kill" cycle will be established during that period. "Grow and kill" is a cycle of applying water, germinating the non-native, invasive species, and spraying with the appropriate chemical. This allows a large portion of the seed bank currently present in the soil to be removed. Eliminating or substantially reducing the competition from non-native exotics early in the life cycle of native plants helps to ensure more rapid growth and cover by the native species.

When necessary, the initial eradication of pest plants shall be performed by hand, by the use of pesticides, or by other methods approved by the Project Biologist. Weed control will be maintained throughout the monitoring period. Weeds will be controlled before their setting of seed. Ongoing weed control will be accomplished manually by the use of a hoe or other tool to uproot the entire plant, a mower or weed whip to cut plants, or by herbicide application.

The type, quantity, and method of herbicide application will be determined by a California-licensed Pest Control Advisor (PCA) who will inspect the site, write project recommendations, and submit same to the Project Biologist for approval. Pesticide recommendations shall include, but are not limited to, the pesticides to be used, rates of application, methods of application, and areas to which pesticides are to be applied.

A licensed Pest Control Operator (PCO) may work under the supervision of the PCA who will employ best management practices regarding the timing, quantity, and type of herbicide for each species. The PCA will determine both immediate and follow-up herbicide application for each species.

Weed species identified as invasive, particularly tenacious, or those with wind-borne seed will be subject to the earliest control efforts. The Project Biologist will direct the contractor regarding the selection of target weed species, their location, and the timing of weed control operations to ensure that native plants are avoided to the extent possible. A summary of weed removal methods are provided in Table 3-1.

**TABLE 3-1
ERADICATION METHODS FOR INVASIVE PLANTS**

Method	Application Method	Time	Equipment	Advantage	Disadvantage
Manual	-Best on isolated individual patches	-Remove late summer to early fall	-Shovel -Weed wacker -Loppers -Brush cutters	-No herbicide use -Low soil disturbance	-Low effectiveness -Resprouting likely to occur
Foliar Spray	-Small or moderate stands of pure invasive	-Spray late summer to early fall	-Sprayer (backpack or mounted) -Glyphosate herbicide	-Low soil disturbance -Relatively effective	-Use of herbicide -Drift spray on non-target plants -Leave above ground biomass
Cut Stem/Stump Spray	-Large pure stands of invasive stands near or mixed with native vegetation	-Cut & Spray late summer to early fall	-Weed wacker -Loppers -Brush cutters -Wand applicator -Glyphosate herbicide	-Reduction of overspray on non-target -Can remove above ground biomass	-Resprouting likely to occur -Cost of removing biomass off site if necessary
Cut, Resprout, & Spray	-Large pure stands of invasive	-Cut in spring -Spray resprouts late summer to early fall	-Weed wacker -Loppers -Brush cutters -Sprayer (backpack or mounted) -Glyphosate herbicide	-Reduction of overspray on non-target -Can remove above ground biomass	-Resprouting likely to occur -Cost of removing biomass off site if necessary
Mechanical	-Large pure stands of invasive	-Cut or mow canes outside of nesting season -Excavate in dry season	-Specialized excavator	-Root/rhizome removal	-High soil disturbance -Some resprouting likely to occur if all roots are not removed

Contractor Education

All aspects of the Mitigation Plan concerning permit requirements, site protection, maintenance inspections, landscape procedures, and monitoring will be reviewed with the appropriate contractors prior to the commencement of grading or any construction work.

All contractors, subcontractors, and project supervisors will be notified of the Corps Authorization, the CDFG Streambed Alteration Agreement, and the CCC Coastal Development Permit. Copies of the permits shall be kept on site at all times during periods of active work and must be presented to any agency personnel upon demand.

D. Planting Plan

Upland grassland will be established within the proposed mitigation areas, and MSS and SCBS will be established as a PDF within the proposed restoration areas.

The habitat components were selected based on surveys conducted during various biological survey visits including vegetation mapping, jurisdictional delineation, and subsequent site visits to further evaluate the mitigation and PDF sites for suitability. The upland grassland components are conducive for supporting foraging raptors, and the MSS and SCBS is conducive to supporting the coastal California gnatcatcher and coastal cactus wren. No planting shall be done in any area until the area concerned has been prepared in accordance with the plans and presents an appearance satisfactory to the Project Biologist.

Plant Palette

The mitigation sites will be vegetated with plant species native to the Orange County coast including maritime succulent scrub, and southern coastal bluff scrub as described by the Orange County Environmental Management Agency⁸, with additions from the associations described by Sawyer and Keeler-Wolf⁹. The proposed plant palettes for the mitigation and PDF habitat types are designated below in Tables 3-2 through 3-4. The plant palette includes recommendations for plant species composition based on other restoration programs. Plant quantities, spacing, stock type, and distribution shall be determined in consultation with the CDFG and CCC prior to planting.

TABLE 3-2 UPLAND GRASSLAND PLANT PALETTE 32.32 ACRES	
Botanic Name	Common Name
<i>Melica imperfecta</i>	Coast Range Melica
<i>Nassella pulchra</i>	Purple needlegrass
<i>Nassella lepida</i>	Foothill Needlegrass
<i>Bothriochloa barbinodis</i>	Beardgrass
<i>Distichlis spicata</i>	Saltgrass
<i>Lasthenia californica</i>	California goldfields

⁸ County of Orange Environmental Management Agency, Department of Planning. 1992. Habitat Classification System, Natural Resources Geographic Information System (GIS) project. By John Gray, Ph.D. and David Bramlet. Santa Ana, California

⁹ Sawyer, J. O., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, California; the approximately equivalent vegetation series for maritime succulent scrub is coast prickly-pear series in this manual, and the approximately equivalent vegetation series for southern coastal bluff scrub is California encelia series in this manual.

TABLE 3-3 MARITIME SUCCULENT SCRUB PLANT PALETTE 0.18 ACRE MITIGATION 7.42 ACRES PDF	
Botanic Name	Common Name
Canopy Layer	
<i>Encelia californica</i>	California sunflower
<i>Isomeris arborea</i>	Bladderpod
<i>Opuntia prolifera</i>	Coastal Cholla
<i>Opuntia littoralis</i>	Coast Prickly Pear
<i>Eriophyllum confertiflorum</i>	Golden Yarrow
<i>Euphorbia misera</i>	Cliff Spurge
<i>Atriplex lentiformis breweri</i>	Brewer's saltbush
<i>Lycium californicum</i>	California box-thorn
Ground Cover/Herbaceous Layer	
<i>Dudleya lanceolata</i>	Lance-leaved Dudleya
<i>Melica imperfecta</i>	Coast Range Melica
<i>Nassella pulchra</i>	Purple needlegrass
<i>Nassella lepida</i>	Foothill Needlegrass
<i>Bothriochloa barbinodis</i>	Beardgrass
<i>Distichlis spicata</i>	Saltgrass
<i>Corethrogyne filaginifolia</i>	Common sand aster

TABLE 3-4 COASTAL BLUFF SCRUB PLANT PALETTE 4.75 ACRES	
Botanic Name	Common Name
Canopy Layer	
<i>Encelia californica</i>	California sunflower
<i>Isomeris arborea</i>	Bladderpod
<i>Lycium californicum</i>	California box-thorn
<i>Mirabilis californica</i>	Wishbone bush
<i>Eriophyllum confertiflorum</i>	Golden Yarrow
<i>Euphorbia misera</i>	Cliff Spurge
<i>Atriplex lentiformis breweri</i>	Brewer's saltbush
<i>Suaeda californica</i>	Woolly Seablite
Ground Cover/Herbaceous Layer	
<i>Dudleya lanceolata</i>	Lance-leaved Dudleya
<i>Bothriochloa barbinodis</i>	Beardgrass
<i>Distichlis spicata</i>	Saltgrass
<i>Corethrogyne filaginifolia</i>	Common sand aster

Source of Plant Materials

It is preferred that the source of all propagules and seed used at the mitigation and PDF sites be from the site or adjacent areas. If not available, the remainder of propagules and seed required

will be from wild sources within Central Orange County and collected as close to the mitigation site as possible to preserve regional genetic integrity.

Contract Growing

Contract growing of all container plants shall be by a local experienced native plant nursery. Substitution of plant material at the time of planting depends solely upon the discretion of the Project Biologist. Any substitutions that are approved will be documented in the As-Built Plans.

Container Plants

One-gallon container stock, rosepots, and liners shall be utilized for container stock production in order to develop vertical heterogeneity (strata). All plant materials will be inspected by the Project Biologist and approved as healthy, disease free, and of proper size prior to planting. Overgrown, root-bound container stock will be rejected.

Mycorrhizal Fungi

Mycorrhizae are specialized fungi found on plant roots. A symbiotic relationship exists between plant roots and mycorrhizae wherein the plants benefit from the increased ability to take up nutrients and withstand drought when mycorrhizae are present. This relationship is essential to the growth rate, well-being, and longevity of native plant communities. Plant utilization of mycorrhizal fungi markedly increases the success of revegetation on disturbed or degraded lands. All appropriate container-grown plants, except those known to be non-host species, shall be inoculated with mycorrhizal fungi prior to delivery to the job site.

Plant Placement

Container stock will be laid out in such a manner that mimics natural plant distribution (i.e., in clusters and islands) to emulate regional reference sites. The Project Biologist will monitor and confirm that trees and shrubs have been placed at the designed elevation relative to the water source supporting them, such as ground water.

Planting Method for Rose Pot and/or Liner Plant Stock

Rose pot and/or liner plant stock will be placed in a hole measuring at least twice the diameter and depth of the container. The root structure will be examined and excess root material removed. The top of the rootball will be set slightly above finish grade. The planting hole will be backfilled with native soil. Fertilizer, watering basins, and mulch are not required for this planting method.

Planting Method for Container Stock

One-gallon container stock will be planted in a hole measuring at least twice the diameter of the container and twice the depth. Container stock will be thoroughly watered the day before planting. One teaspoon (0.3 oz.) of Osmocote 14-14-14 (or equal) will be placed one inch below the root zone and backfilled with native soil to proper planting depth. The container will be upended into the palm of the hand to avoid damage to the root structure and placed in the planting hole. The top of the root ball will be set one inch above finish grade. The planting hole will be backfilled with native soil.

A three-inch high, hand-compacted earth berm, approximately 36 inches in diameter, will then be constructed around each container plant. This watering basin will be maintained until the plants are no longer irrigated. Mulch will be applied as a top dressing, two to three inches thick but must not come in contact with the stem of the plant. Container stock will be watered immediately after installation.

Pruning and Staking

There will be no pruning or staking of any vegetation. Diseased or insect-damaged foliage, if sufficient to require pruning, will serve as a benchmark for rejection of plant material.

E. Irrigation Plan

Supplemental irrigation may be used solely for the purpose of establishing the plants at the mitigation and PDF sites and is of a temporary nature. The goal of the irrigation program is to obtain germination and growth with the least amount of irrigation. Frequent irrigation encourages weed invasion and leaches nutrients from the soil.

The mitigation and PDF sites will be initially supported by a short-term automatic irrigation system as well as from existing water sources. Drip irrigation may be provided for trees and shrubs planted on the slopes. The container stock will be irrigated as long as necessary to establish the root systems in the native soils, as directed by the Project Biologist. The main line will be installed below-grade. All lateral lines will be installed above-grade for ease of removal and inspection. Alternatively, lateral lines may be installed below-grade and abandoned in place after project conclusion.

The critical period for irrigation is during the first winter and early spring following planting. During this time, roots are not well established and an unseasonable drought can cause high mortality. During dry periods after plant installation, the Project Biologist and the maintenance contractor will regularly inspect soil moisture. Watering during the summer dry season will occur as frequently as required.

After the initial plant establishment period, water will be applied infrequently and only as required to prevent the mortality of plants and seedlings. The irrigation methods employed will attempt to mimic wet rainfall years by incorporating evenly spaced, infrequent, deep applications of water.

When the plantings are sufficiently established and no longer require supplemental irrigation, the Project Biologist shall notify the landscape contractor to remove all above-grade irrigation system components from the mitigation and PDF sites.

F. As-Built Conditions

Once the implementation of the mitigation and PDF has been completed, the Applicant will submit "As-Built" drawings to the USFWS within 45 days after completion of construction. The

drawings will identify the date installation was completed and if there were any deviations from the approved mitigation plan.

V. MAINTENANCE ACTIVITIES DURING THE MONITORING PERIOD

A. Maintenance Activities

The purpose of this program is to ensure the success of the mitigation and PDF plantings. Maintenance will occur over the Monitoring Period. The Project Biologist will monitor all aspects of the revegetation in an effort to detect any problems at an early state. Potential problems could arise from irrigation failure, erosion, vandalism, competition from weeds and invasive species, and unacceptable levels of disease and predation.

These maintenance guidelines are specifically tailored for native plant establishment. The maintenance personnel will be fully informed regarding the habitat establishment program so they understand the goals of the effort and the maintenance requirements. A landscape contractor with experience and knowledge in native plant habitat restoration will supervise all maintenance personnel.

For a period of 120 days following completion of the planting installation, the initial landscape contractor will be responsible for the care of the plantings. The purpose of the 120-day establishment period is to ensure continuity between the installation of the plant material and its short-term maintenance. The contractor's presence during this period is proven to increase project success. The contractor will control the spread of weed species and identify any efforts necessary to ensure the health and survival of the plantings.

Following the 120-day establishment period the project will be evaluated for health of plant material, and if judged satisfactory by the Project Biologist, the establishment period will be considered concluded and the long-term habitat maintenance program will begin. A different landscape contractor may implement this period of maintenance; however, the Project Biologist will continue to review the project's success.

Damage to plants, irrigation systems, and other facilities occurring as a result of unusual weather or vandalism will be repaired or replaced as soon as practicable.

General Maintenance

The Contractor will perform the following tasks as general maintenance duties:

- Plant Inspection
- Weed control
- Irrigation water volume and frequency
- General maintenance of irrigation system
- Trash and debris removal
- Pest control
- Plant replacement

Plant Inspection

After initial planting, the Project Biologist will check the mitigation site on a monthly basis through the 18th month. The plants shall be inspected on a quarterly basis thereafter.

Weed Control

The mitigation site shall be maintained free of weeds during the monitoring period. Weed eradication will minimize competition that could prevent the establishment of native species. All maintenance personnel will be trained to distinguish weed species from native vegetation to ensure only weedy species are removed or sprayed with herbicide.

As weeds become evident, they should be immediately removed by hand or controlled with an appropriate herbicide as determined by a licensed Pest Control Advisor (PCA). Weed debris shall be removed from the project area as accumulated and disposed of as permitted by law.

Weeds shall be manually removed before they can attain a height of three-inches (3") at intervals of not more than 30 days for the first two years of the project. All portions of the plant will be removed, including the roots. The Project Biologist shall direct the contractor regarding the selection of target weed species, their location, and the timing of weed control operations to ensure that native plants are avoided to the extent possible. Pulled weeds will be placed on a "mantilla" or other type of tarp to prevent the seeds from coming in contact with the ground.

A cleared space, 18 inches from the base of the plant, will be maintained around each container plant to minimize competition from other plant species. Mulch, two-inches thick within the watering basin, will be maintained throughout the monitoring period. Leaf and branch drop and organic debris of native species shall be left in place.

Irrigation Water Volume and Frequency

The contractor shall be responsible for applying sufficient irrigation water to adequately establish new plant materials, and germinate and establish the applied seed. Irrigation water shall be applied in such a way as to encourage deep root growth (periodic deep irrigation versus frequent light irrigation). The contractor will allow soil to dry down to approximately 50- to 60-percent of field capacity (in the top six or ten inches after germination and during seedling establishment) before the next irrigation cycle. Wetting of the full root zone and drying of the soil between irrigation events is essential to the maintenance of the plants and the promotion of a deep root zone that will support the vegetation in the years after establishment. Systems may need to be on for as long as six to eight hours at a time in order to get complete water penetration to the lower soil horizons to encourage deep root growth. A soil probe or shovel shall be used to directly examine soil moisture and rooting depth.

General Maintenance of Irrigation System

The contractor will be responsible for the regular maintenance and repair of all aspects of the irrigation system. Poorly functioning or non-functioning parts shall be replaced immediately so as to not endanger the plantings.

General system checks shall be conducted no less than weekly for the first month after installation to ensure the system is functioning correctly and monthly thereafter, except during periods when the irrigation system is not in operation as recommended by the Project Biologist.

Any erosion or slippage of soil caused by the contractor's inadequate maintenance or operation of irrigation facilities, shall be repaired by the contractor at his/her expense.

Trash and Debris Removal

The mitigation site shall be well maintained in order to deter vandalism and dumping of trash. The contractor is responsible for avoiding impacts to plantings during trash removal activities. Contractor shall, during daily routine maintenance, manually remove weeds, litter, trash, and debris from the mitigation site and dispose of off site as permitted by law. Dead limbs and tree fall shall be left in place in the revegetation areas.

Pest Control

Young trees and shrubs will be monitored for signs of disease, insect and/or predator damage, and treated as necessary. Badly damaged plants will be pruned to prevent spreading of the pestilence or replaced in kind if removed. Excessive foraging by predators may necessitate protective screening around plants and/or poison baiting of the predators. The Project Biologist will be consulted on any pest control measures to be implemented.

The contractor shall be responsible for maintaining a rodent-free project. All measures to eradicate rodents must be as directed by a licensed pest control consultant.

Plant Replacement

The installation contractor will be responsible for replacing all container stock plants terminally diseased or dead for 120 days after plant installation. The long-term maintenance contractor will thereafter replace all dead and/or declining plants in the winter months as recommended by the Project Biologist. Replacement plants shall be furnished and planted by the contractor at his/her expense.

Replacement plants shall conform to the species, size requirements, and spacing as specified for the plants being replaced. The replacement plants shall be purchased from inventory at the same native plant nursery as were the contract-grown plant stock.

Fertilization

If nutrient deficiencies are observed during site monitoring, the Project Biologist may specify applications of slow-release pellet fertilizer or soil amendments to speed initial growth or as a remedial measure. These applications shall occur at the onset of the rainy season following the manufacturer's recommendations. Fertilizer will not be applied other than under the direction of the Project Biologist.

Pruning

No pruning is necessary unless otherwise specified by the Project Biologist. Dead wood shall be left on trees or where it has fallen as it plays an important role in habitat creation and soil formation.

Staking of Trees

Staking of trees is to be avoided unless determined necessary by the Project Biologist. All stakes shall be removed at the completion of the five-year monitoring period, or earlier as determined by the Project Biologist. All stakes shall be removed by the contractor and disposed of off-site in a legal manner.

B. Responsible Parties

The Applicant will be responsible for financing and carrying out maintenance activities.

Newport Banning Ranch LLC
1300 Quail Street, Suite 100
Newport Beach, CA 92660
Contact: Mike Mohler
Telephone: (949) 833-0222
Fax: (949) 833-1960

C. Maintenance Schedule

The mitigation and restoration maintenance and monitoring program will begin with the construction process and continue during the Monitoring Period. Table 3-5 below indicates the schedule of maintenance inspections.

TABLE 3- 5 MAINTENANCE SCHEDULE					
Maintenance Task	Year				
	1	2	3	4	5
Plant Inspection	Monthly first 12 months	Monthly through 18th month; quarterly thereafter	Quarterly	Quarterly	Quarterly
Irrigation System Inspection	Monthly, or more frequently if required	Monthly	As Required	N/A	N/A
Trash and Debris Removal	Monthly	Quarterly	Quarterly	Quarterly	Quarterly

Weed Control	Minimum of Monthly	Monthly	Quarterly	Quarterly	Quarterly
Pest Control	Monthly	Bi-monthly	Quarterly	Quarterly	Quarterly
Plant Replacement	Annually	Annually	Annually	Annually	Annually
Fertilization (if necessary)	Annually	Annually	N/A	N/A	N/A

VI. MONITORING PLAN

A. Initial Monitoring Effort

The mitigation and PDF sites will be monitored immediately following establishment and 30 days thereafter. The initial biological and ecological status of the mitigation and PDF sites will be established and the as-built condition of the site will be documented. Long-term monitoring of the mitigation and PDF sites will begin following this initial assessment.

B. Performance Criteria

The success of habitat restoration is defined as the restoration of a functional ecosystem. Success is usually measured by percent coverage by target species. Natural habitats rarely exhibit 100-percent coverage, but rather include a considerable proportion of open spaces. While this monitoring program uses percent coverage criteria, it is noted that determination of successful coverage is expected to be relative to other similar native habitats typical of the region. Since no undisturbed coastal sage scrub habitat is available on site to act as a reference, a publicly accessible off site relatively undisturbed reference site will be identified prior to the beginning of installation of the coastal sage scrub.

The means of determining successful enhancement for this site will be through series of measurements for species composition, exotic species cover, and cover by native species. All of these, except non-native species cover, should increase over time. Cover by non-native species should be the opposite; it should decrease with time, particularly because one of the primary goals of the project is to substantially reduce or eliminate non-native species from the restoration site. After the initial non-native species eradication and associated planting effort has been completed, the restoration site will be monitored by the project monitor on a monthly basis for the 12 months and quarterly for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization, will be completed during each monitoring visit. General observations, such as fitness and health of the planted species, pest problems, weed persistence/establishment, mortality, and drought stress, will be noted in each site walkover. The Project Monitor will determine remedial measures necessary to facilitate compliance with performance standards.

Data regarding wildlife usage will be collected during each visit.

Quantitative vegetation data will be collected annually using accepted vegetative sampling methods in order to evaluate survivorship, species coverage, and species composition.

In the event that plantings should fail to meet the specified requirements, compliance will be ensured by the performance of either or both of the following remedial procedures by the contractor on an as-needed basis as directed by the Project Monitor: (1) replacing unsuccessful plantings with appropriate-sized stock or seed mixes to meet stated cover or survival requirements and /or (2) performing maintenance procedures to ensure the site conditions are appropriate (e.g., non-native species removal). Remedial actions in planting areas shall be based on detailed investigations (such as soil tests and excavations of failed plantings to examine root development) to determine causes of failure.

Standard Vegetation Monitoring procedures will be as follows:

First-Year Monitoring

Success Standard: 40-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 10-percent coverage by non-native shrubs species; and
No more than 20-percent coverage by non-native annual species

Second-Year Monitoring

Success Standard: 50-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 5-percent coverage by non-native shrubs species; and
No more than 15-percent coverage by non-native annual species

Third-Year Monitoring

Success Standard: 65-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrubs species; and
No more than 15-percent coverage by non-native annual species

Fourth-Year Monitoring

Success Standard: 75-percent coverage of native species, relative to the reference site (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrub species; and
No more than 10-percent coverage by non-native annual species

Fifth-Year Monitoring

Success Standard: 80-percent coverage of native species, relative to the reference site (<5-percent deviation allowed); or utilized by nesting California gnatcatchers;
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrub species; and
No more than 10-percent coverage by non-native annual species

C. Monitoring Methods

Monitoring will assess the attainment of annual and final success criteria and identify the need to implement contingency measures in the event of failure. Monitoring methods include an annual tally of dead and/or declining plant stock and visual estimates of cover as well as field sampling techniques that are based in accordance with the methodology developed by the California Native Plant Society (CNPS).¹⁰ Please refer to *A Manual of California Vegetation* for further details on this sampling method.

Sampling Techniques

Quantitative sampling within the restoration site will be performed using one-meter quadrats that will be placed randomly throughout the site. Placement of quadrats will be determined using random numbers tables to provide two coordinates one that indicates the distance along a longitudinal centerline bisecting the site and one that determines the distance from the line. Plots will be placed on alternating sides of the centerline and perpendicular to the centerline. Vegetative cover will be visually estimated within the quadrat for each species present and recorded on a data sheet. Any species observed during the sampling that does not fall within a quadrat will be recorded and included on the list of species for the restoration site. At least 30 replicates will be initially sampled. Sample variance from data collection in years one through three will be used to determine if 30 samples is adequate. If a power analysis indicates that more than 30 samples are required, additional transects or quadrats will be added. If power analysis indicates that fewer than 30 samples are required, the number of quadrats will be reduced. Sampling will be conducted with sufficient replication to detect a 10% difference in absolute ground cover between the mean of the restoration and the success standard with 90% power at an alpha level of 0.10. The mean native cover for the restoration site will be compared to the performance criteria at the end of five years using an appropriate inferential test such as a single-sample t-test. The mean cover for the restoration site will be considered to meet the performance criteria if the resulting alpha level is greater than 0.10.

Photo-Documentation

Permanent stations for photo-documentation will be established during the first annual monitoring event. Photos shall be taken each monitoring period from the same vantage point and in the same direction each year and shall reflect material discussed in the annual monitoring report.

¹⁰ Sawyer, John O. and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

Qualified habitat restoration specialists, biologists, or horticulturists with appropriate credentials and experience in native habitat restoration shall perform monitoring. Continuity within the personnel and methodology of monitoring shall be maintained insofar as possible to ensure comparable assessments.

Monitoring Period

The Monitoring Period shall last until whichever of the following occurs first: (a) five years from the installation of a mitigation site or (b) until the Project Biologist has determined, with resource agency concurrence, that the fourth-year success standard has been met as to a mitigation site and, additionally, that such site (i) is self-sustaining in the absence of irrigation, (ii) is occupied by nesting gnatcatchers and/or cactus wrens, as appropriate, and (iii) has the structure, composition, and functionality of naturally occurring coastal sage scrub or southern cactus scrub, as appropriate.

Qualitative Monitoring

The Project Biologist will conduct qualitative monitoring surveys on a monthly basis for the first 18 months and quarterly thereafter for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization will be completed during each monitoring visit. General observations such as fitness and health of the planted species, pest problems, weed establishment, mortality, and drought stress, will be noted in each site walkover. The Project Biologist will also note observations on wildlife use and native plant recruitment for the purpose of later discussion in the annual reports. Records will be kept of mortality and other problems such as insect damage, weed infestation, and soil loss. The Project Biologist will determine remedial measures necessary to facilitate compliance with performance standards.

D. Annual Reports

At the end of each of the growing seasons during the Monitoring Period, an annual report will be prepared. These reports will be “cumulative” including the results from previous annual reports and will assess both attainment of yearly target criteria and progress toward final success criteria. These reports will include the following:

- a list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities for that year;
- an analysis of all qualitative monitoring data;
- copies of monitoring photographs;
- maps identifying monitoring areas, transects, and planting zones; and
- copies of previous reports.

E. Schedule

Annual Reports will be submitted to the appropriate agencies by December 31 of each year for the year in which quantitative sampling was performed.

VII. COMPLETION of MITIGATION and PROJECT DESIGN FEATURE

Upon completion of the Monitoring Period for the mitigation and PDF sites, the Applicant will notify the City, Corps, CDFG, CCC, and USFWS by submitting a Final Monitoring Report that documents this completion. Following receipt of the final report, the Applicant will, at the request of the City, Corps, CDFG, CCC, and USFWS, provide access and guidance through the mitigation and PDF sites to confirm the adequate completion of the mitigation and PDF.

VIII. CONTINGENCY MEASURES

A. Initiating Procedures

If a performance standard is not met for any mitigation or PDF site or sites in any year or if the approved success criteria are not met, the Project Biologist will prepare an analysis of the cause(s) of failure and, if determined necessary by the City, Corps, CDFG, CCC and USFWS, propose remedial actions for approval. If any mitigation or PDF site has not met one or more of the success criteria or performance standards by the end of the Monitoring Period, the responsible party's maintenance and monitoring obligations shall continue until the above-referenced agencies each gives final approval that the mitigation obligations have been satisfied. It is therefore incumbent upon the Project Biologist to foresee project deficiencies as part of the monitoring program and take appropriate steps to address the situation.

B. Funding Mechanism

The Applicant will fund planning, implementation, maintenance and monitoring of any contingency measures that may be required to achieve mitigation goals.

C. Responsible Parties

The Applicant will be responsible for implementing, maintaining, and monitoring any contingency procedures.

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SECTION 4. VERNAL POOL COMPLEX

I. GOAL of RESTORATION: Vernal Pool Complex

As one component of the project, the Vernal Pool Complex located in the east central portion of the Property at 17th street extended, which supports the federally-listed San Diego fairy shrimp (*Branchinecta sandiegonensis*) and is located within US Fish and Wildlife Service-designated critical habitat for San Diego fairy shrimp, will be restored and preserved. The pools support a mix of herbaceous perennial hydrophytes including creeping spikerush (*Eleocharis macrostachya*) and saltgrass (*Distichlis spicata*) along with annuals that are indicative of vernal pool habitats in southern California including woolly marbles (*Psilocarphus brevissimus*) and waterfern (*Marsilea vestita*). Mulefat (*Baccharis salicifolia*) has colonized the pool and now accounts for a substantial component of the vegetative cover. Restoration would include removing the mulefat and non-native species. Additionally, the vernal pool watershed will be expanded to the north and west of the pools in order to mitigate for impacts to 0.32 acre of watershed within San Diego fairy shrimp critical habitat east of the vernal pools in order to accommodate a proposed road alignment, resulting in a net increase of 0.71 acre of vernal pool watershed. Although the vernal pools themselves will not be impacted, the pools will be restored in order to improve habitat values. It should be noted, however, that the work will occur entirely outside of the rainy season, and as such no temporal loss of vernal pool watershed or San Diego fairy shrimp habitat will occur.

This section (i.e., Section 1) addresses restoration of 0.32 acre of vernal pool habitat, expansion of 0.71 acre of vernal pool watershed for mitigation, and enhancement of the entire vernal pool watershed through non-native removal and revegetation.

Please note that the total acreage of the vernal pool restoration area is included in the 13.65 acres of alkali meadow raptor foraging mitigation discussed in Section 2; however, restoration of the vernal pool complex is being described separately from the raptor foraging mitigation.

A. Type(s) of Habitat to be Restored for Mitigation

As noted above, vernal pool restoration will consist of removing mulefat and non-native species, and the vernal pool watershed expansion will consist of grading the new watershed area such that rainfall will drain into the pools. In addition, the watershed will be enhanced through removal of mulefat and non-native species and revegetation with native alkali meadow dominated by alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), seaside heliotrope (*Heliotropium curassivicum*), alkali weed (*Cressa truxillensis*), saltmarsh sand spurrey (*Spergularia marina*), alkali sida (*Malvella leprosa*), miniature lupine (*Lupinus bicolor*), western plantain (*Plantago erecta*), and California goldfields (*Lasthenia californica*).

B. Time Lapse

Grading to expand the vernal pool watershed will occur in advance of or concurrently with grading associated with road construction. Shaping and planting of the watershed and removal of mulefat and non-native species within the pools will occur concurrently will or immediately following grading of the watershed. Additional grading and planting will occur outside the rainy season to ensure that the watershed is fully functioning at the start of the first rainy season following expansion and enhancement of the watershed.

II. FINAL SUCCESS CRITERIA

A. Target Functions and Values

Restoration efforts will increase biological productivity of the preserved open space and provide enhanced habitat for wildlife in the vernal pool complex.

Specifically, expansion of the watershed by 0.71 acre will increase hydrological input to the pools, which will promote longer-term ponding for San Diego fairy shrimp to complete its life cycle. Restoration of the pools by removing mulefat and non-native species will restore the pools to characteristic vernal pool habitat, as vernal pools do not typically support woody vegetation such as mulefat. The restoration program will also provide increased wildlife habitat function for migratory birds that use the pools as a migration stopover, and the increased watershed area will be planted with native alkali meadow favorable for raptor foraging.

B. Target Acreages for Vernal Pool Restoration and Watershed Expansion/Enhancement

A total of 0.32 acre of vernal pool habitat will be restored, and the vernal pool watershed will be expanded by 1.03 acres to offset impacts to 0.32 acre of watershed within San Diego fairy shrimp critical habitat and 0.03 acre of watershed outside of San Diego fairy shrimp critical habitat, for a net expansion of 0.68 acre. The entire 2.91-acre vernal pool watershed will be subject to non-native species removal and enhancement with native alkali meadow species. It should be noted that this vernal pool mitigation/restoration acreage total is included in the 13.65 acres of alkali meadow raptor foraging mitigation.

III. PROPOSED RESTORATION SITES

A. Location and Size of Mitigation Areas

The 0.32 acre of vernal pool restoration will occur within the existing vernal pool complex, and the 1.03 acres of vernal pool watershed expansion will occur north and west of the existing watershed. Enhancement will occur over the entire 2.91-acre vernal pool watershed following grading for expansion [Exhibit 3].

B. Ownership Status

The property is currently owned by Newport Banning Ranch LLC, who is also the Applicant.

C. Present and Proposed Uses of Mitigation Areas

The vernal pools and watershed are presently subject to oil field operations, providing limited value to wildlife. If left undisturbed, the vernal pool complex would continue to function as limited wildlife habitat. Upon completion of the vernal pool restoration program, the vernal pool complex will provide enhanced wildlife habitat functions for San Diego fairy shrimp and migratory birds that use the vernal pools as a migration stopover.

To ensure permanent protection of the restoration areas, the applicant will record a restrictive covenant in the form of a conservation easement and/or deed restriction that will prevent development of the areas proposed for restoration.

D. Present and Proposed Uses of All Adjacent Areas

The surrounding land uses for the vernal pool complex is oilfield operations and earthen access roads for oilfield operations. Following construction of the proposed development, the vernal pool complex will be bordered by development to the east, west, and south. To the north, the pool complex will be immediately bordered by an access road, and open space beyond the road. The access road to the north will be constructed with a culverted wildlife crossing to provide open space connectivity.

IV. IMPLEMENTATION PLAN

A. Rationale for Expecting Implementation Success

The mitigation program will be implemented in advance of or concurrently with impacts to the vernal pool watershed. The specific rationale for expecting success in the implementation of the components of the mitigation program is provided below.

Although the vernal pool habitat is artificial and is generally not vegetated with species characteristic of southern California vernal pools, it nevertheless supports a dense population of San Diego fairy shrimp. The goal of this program is to enhance the habitat functions, which will in turn increase the likelihood of long-term persistence of San Diego fairy shrimp. The restoration program will accomplish this goal by implementing the following: expansion of the watershed, thereby improving hydrologic function of the pools, and enhancement of the watershed area with species that occur on-site and are known to perform well in habitat restoration programs. A qualified habitat restoration specialist or other individual knowledgeable in native plant revegetation, hereinafter referred to as the Project Biologist, will supervise the implementation, maintenance, and five-year monitoring of the mitigation plan.

B. Responsible Parties

The Applicant will be responsible for the implementation of the mitigation project.

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C. Site Preparation

Site preparation for the vernal pool complex shall include the use of hand crews to selectively remove mulefat and non-native vegetation from the vernal pools. Site the preparation for the vernal pool watershed expansion/enhancement area shall include removing pipes and/or other oil field infrastructure from the pools and watershed enhancement/expansion area, grading with heavy equipment to establish positive flow into the vernal pools, and planting with native alkali meadow vegetation. Restoration will be implemented during the appropriate planting period and will be performed in advance of or concurrently with grading of the development areas. All work will be performed outside of the rainy season.

Ongoing Exotic Vegetation Control

The predominance of non-native, invasive weed species throughout California has presented a challenge to most native revegetation projects. Weedy species are opportunistic, rapidly colonizing disturbed sites such as revegetation sites. This can lead to the displacement of native species if the weedy species are not properly treated. Several of these invasive species are capable of out-competing most native understory and herbaceous plants.

One of the largest obstacles to the successful revegetation of a site is the exotic seed bank residing in the soil. This seed bank can persist for several years or even decades and poses one of the major threats to restoration programs. Undesirable exotic plants will be eradicated either during initial site grading or prior to site preparation. If grading of the watershed precedes planting by more than a few months, it will be necessary to eradicate undesirable exotic plants that have become established prior to planting and seeding of the mitigation sites. If deemed necessary, a "grow-and-kill" cycle will be established during that period. "Grow and kill" is a cycle of applying water, germinating the non-native, invasive species, and spraying with the appropriate chemical. This allows a large portion of the seed bank currently present in the soil to be removed. Eliminating or substantially reducing the competition from non-native exotics early

in the life cycle of native plants helps to ensure more rapid growth and cover by the native species. However, the “grow and kill” cycle will not be implemented in the 0.32-acre vernal pool area, as application of irrigation water to the vernal pools is undesirable due to the potential to impact San Diego fairy shrimp. Therefore, if irrigation water is used for a “grow and kill” cycle, it shall only be implemented within the watershed area, and irrigation water will be prevented from entering the vernal pools through the use of barriers such as sandbags and by limiting the water flow so that it does not pond and/or flow into the pools under the direction of the Project Biologist.

When necessary, the initial eradication of pest plants shall be performed by hand, by the use of pesticides, or by other methods approved by the Project Biologist. Weed control will be maintained throughout the monitoring period. Weeds will be controlled before their setting of seed. Ongoing weed control will be accomplished manually by the use of a hoe or other tool to uproot the entire plant, a mower or weed whip to cut plants, or by herbicide application. The type, quantity, and method of herbicide application will be determined by a California licensed Pest Control Advisor (PCA) who will inspect the site and write project recommendations and submit the recommendations to the Project Biologist for approval. Pesticide recommendations shall include, but are not limited to, the pesticides to be used, rates of application, methods of application, and areas to which pesticides are to be applied. A licensed Pest Control Operator (PCO) may work under the supervision of the PCA who will employ best management practices regarding the timing, quantity, and type of herbicide for each species. The PCA will determine both immediate and follow-up herbicide application for each species.

Weed species identified as invasive, particularly tenacious, or those with wind-borne seed will be subject to the earliest control efforts. The Project Biologist will direct the contractor regarding the selection of target weed species, their location, and the timing of weed control operations to ensure that native plants are avoided to the extent possible. A summary of weed removal methods is provided in Table 4-1 below.

TABLE 4-1 ERADICATION METHODS FOR INVASIVE PLANTS					
Method	Application Method	Time	Equipment	Advantage	Disadvantage
Manual	-Best on isolated individual patches	-Remove late summer to early fall	-Shovel -Weed wacker -Loppers -Brush cutters	-No herbicide use -Low soil disturbance	-Low effectiveness -Resprouting likely to occur
Foliar Spray	-Small or moderate stands of pure invasive	-Spray late summer to early fall	-Sprayer (backpack or mounted) -Glyphosate Herbicide	-Low soil disturbance -Relatively effective	-Use of herbicide -Drift spray on non-target plants -Leave above ground biomass

Cut Stem/Stump Spray	-Large pure stands of invasive stands near or mixed with native vegetation	-Cut & Spray late summer to early fall	-Weed wacker -Loppers -Brush cutters -Wand applicator -Glyphosate Herbicide	-Reduction of overspray on non-target -Can remove above ground biomass	-Resprouting likely to occur -Cost of removing biomass off site if necessary
Cut, Resprout, & Spray	-Large pure stands of invasive	-Cut in spring - Spray resprouts late summer to early fall	-Weed wacker -Loppers -brush cutters -Sprayer (backpack or mounted) -Glyphosate Herbicide	-Reduction of overspray on non-target -Can remove above ground biomass	-Resprouting likely to occur -Cost of removing biomass off site if necessary
Mechanical	-Large pure stands of invasive	-Cut or mow canes outside of nesting season -Excavate in dry season	-Specialized excavator	-Root/ rhizome removal	-High soil disturbance -Some resprouting likely to occur if all roots are not removed

Contractor Education

All aspects of the Mitigation Plan concerning permit requirements, site protection, maintenance inspections, landscape procedures, and monitoring will be reviewed with the appropriate contractors prior to the commencement of grading or any construction work.

All contractors, subcontractors, and project supervisors will be notified of the Corps Authorization and the CDFG Streambed Alteration Agreement. Copies of the permits shall be kept on-site at all times during periods of active work and must be presented to any agency personnel upon demand.

D. Planting Plan

Vernal pool restoration and vernal pool watershed expansion will be established within the proposed mitigation areas depicted on Exhibit 3.

The habitat components were selected based on surveys conducted during various biological survey visits including vegetation mapping, jurisdictional delineation, and subsequent site visits to further evaluate the mitigation and restoration sites for suitability. The native alkali meadow within the expanded watershed is suitable for the watershed function, and is conducive for supporting a variety of foraging raptors. No planting shall be done in any area until the area concerned has been prepared in accordance with the plans and presents an appearance satisfactory to the Project Biologist.

Plant Palette

The mitigation sites will be vegetated with plant species native to the Orange County coast including alkali meadow as described by the former Orange County Environmental Management Agency¹¹, with additions from the associations described by Sawyer and Keeler-Wolf¹² and modifications based on site-specific conditions. The proposed plant palettes for the mitigation and restoration habitat types are designated below in Table 4-2. The plant palette includes recommendations for plant species composition based on other restoration programs.

TABLE 4-2 PLANT PALETTE – VERNAL POOL WATERSHED ENHANCEMENT AREA 2.91 ACRES	
Botanic Name	Common Name
<i>Cressa truxillensis</i>	Alkali weed
<i>Distichlis spicata</i>	Saltgrass
<i>Frankenia salina</i>	Alkali heath
<i>Heliotropium curassivicum</i>	Seaside heliotrope
<i>Lasthenia californica</i>	California goldfields
<i>Lupinus bicolor</i>	Miniature lupine
<i>Malvella leprosa</i>	Alkali sida
<i>Plantago erecta</i>	Western plantain
<i>Spergularia marina</i>	Saltmarsh sand spurrey

Source of Plant Materials

It is preferred that the source of all propagules and seed used at the mitigation and restoration sites be from the site or adjacent areas. If not available, the remainder of propagules and seed required will be from wild sources within Central Orange County and collected as close to the mitigation site as possible to preserve regional genetic integrity.

Contract Growing

Contract growing of all container plants shall be by a local experienced native plant nursery. Substitution of plant material at the time of planting depends solely upon the discretion of the Project Biologist. Any substitutions that are approved will be documented in the As-Built Plans.

¹¹ County of Orange Environmental Management Agency, Department of Planning. 1992. Habitat Classification System, Natural Resources Geographic Information System (GIS) project. By John Gray, Ph.D. and David Bramlet. Santa Ana, California

¹² Sawyer, J. O., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, California; the approximately equivalent vegetation series for maritime succulent scrub is coast prickly-pear series in this manual, and the approximately equivalent vegetation series for southern coastal bluff scrub is California encelia series in this manual.

Container Plants

One-gallon container stock, rosepots, and liners shall be utilized for container stock production in order to develop vertical heterogeneity (strata). All plant materials will be inspected by the Project Biologist and approved as healthy, disease free, and of proper size prior to planting. Overgrown, root-bound container stock will be rejected.

Mycorrhizal Fungi

Mycorrhizae are specialized fungi found on plant roots. A symbiotic relationship exists between plant roots and mycorrhizae wherein the plants benefit from the increased ability to take up nutrients and withstand drought when mycorrhizae are present. This relationship is essential to the growth rate, well-being, and longevity of native plant communities. Plant utilization of mycorrhizal fungi markedly increases the success of revegetation on disturbed or degraded lands. All appropriate container-grown plants, except those known to be non-host species, shall be inoculated with mycorrhizal fungi prior to delivery to the job site.

Plant Placement

Container stock will be laid out in such a manner that mimics natural plant distribution (i.e., in clusters and islands) to emulate regional reference sites. The Project Biologist will monitor and confirm that shrubs have been placed at the designed elevation relative to the water source supporting them, such as ground water.

Planting Method for Rose Pot and/or Liner Plant Stock

Rose pot and/or liner plant stock will be placed in a hole measuring at least twice the diameter and depth of the container. The root structure will be examined and excess root material removed. The top of the rootball will be set slightly above finish grade. The planting hole will be backfilled with native soil. Fertilizer, watering basins, and mulch are not required for this planting method.

Planting Method for Container Stock

One-gallon container stock will be planted in a hole measuring at least twice the diameter of the container and twice the depth. Container stock will be thoroughly watered the day before planting. One teaspoon (0.3 oz.) of Osmocote 14-14-14 (or equal) will be placed one inch below the root zone and backfilled with native soil to proper planting depth. The container will be upended into the palm of the hand to avoid damage to the root structure and placed in the planting hole. The top of the root ball will be set one inch above finish grade. The planting hole will be backfilled with native soil.

A three-inch high, hand-compacted earth berm, approximately 36 inches in diameter, will then be constructed around each container plant. This watering basin will be maintained until the plants are no longer irrigated. Mulch will be applied as a top dressing, 2 to 3 inches thick, but must not come in contact with the stem of the plant. Container stock will be watered immediately after installation.

Pruning and Staking

There will be no pruning or staking of any vegetation. Diseased or insect-damaged foliage, if sufficient to require pruning, will serve as a benchmark for rejection of plant material.

E. Irrigation Plan

Supplemental irrigation may be used solely for the purpose of establishing the plants at the vernal pool watershed expansion site and is of a temporary nature. Irrigation water will not be applied to the 0.32-acre vernal pool restoration area, and barriers such as sandbags will be used under the direction of the Project Biologist to prevent irrigation water from entering the vernal pools. The goal of the irrigation program is to obtain germination and growth with the least amount of irrigation. Frequent irrigation encourages weed invasion and leaches nutrients from the soil.

The vernal pool watershed expansion area will be initially supported by a short-term automatic irrigation system as well as from existing water sources. The container stock will be irrigated as long as necessary to establish the root systems in the native soils, as directed by the Project Biologist. The main line will be installed below-grade. All lateral lines will be installed above-grade for ease of removal and inspection. Alternatively, lateral lines may be installed below-grade and abandoned in place after project conclusion.

The critical period for irrigation is during the first winter and early spring following planting. During this time, roots are not well established and an unseasonable drought can cause high mortality. During dry periods after plant installation, the Project Biologist and the maintenance contractor will regularly inspect soil moisture. Watering during the summer dry season will occur as frequently as required.

After the initial plant establishment period, water will be applied infrequently and only as required to prevent the mortality of plants and seedlings. The irrigation methods employed will attempt to mimic wet rainfall years by incorporating evenly spaced, infrequent, deep applications of water.

When the plantings are sufficiently established and no longer require supplemental irrigation, the Project Biologist shall notify the landscape contractor to remove all above-grade irrigation system components from the mitigation and restoration sites.

F. As-Built Conditions

Once the implementation of the mitigation and restoration sites has been completed, the Applicant will submit "As-Built" drawings to the City, Corps, CDFG, CCC and U.S. Fish and Wildlife Service (USFWS) within 45 days after completion of construction. The drawings will identify the date installation was completed and if there were any deviations from the approved mitigation plan.

V. MAINTENANCE DURING THE MONITORING PERIOD

A. Maintenance Activities

The purpose of this program is to ensure the success of the mitigation and restoration plantings. Maintenance will occur over the Monitoring Period. The Project Biologist will monitor all aspects of the revegetation in an effort to detect any problems at an early state. Potential problems could arise from irrigation failure, erosion, vandalism, competition from weeds and invasive species, and unacceptable levels of disease and predation.

These maintenance guidelines are specifically tailored for native plant establishment. The maintenance personnel will be fully informed regarding the habitat establishment program so they understand the goals of the effort and the maintenance requirements. A landscape contractor with experience and knowledge in native plant habitat restoration will supervise all maintenance personnel.

For a period of 120 days following completion of the planting installation, the initial landscape contractor will be responsible for the care of the plantings. The purpose of the 120-day establishment period is to ensure continuity between the installation of the plant material and its short-term maintenance. The contractor's presence during this period is proven to increase project success. The contractor will control the spread of weed species and identify any efforts necessary to ensure the health and survival of the plantings.

Following the 120-day establishment period the project will be evaluated for health of plant material, and if judged satisfactory by the Project Biologist, the establishment period will be considered concluded and the long-term habitat maintenance program will begin. A different landscape contractor may implement this period of maintenance; however, the Project Biologist will continue to review the project's success.

Damage to plants, irrigation systems, and other facilities occurring as a result of unusual weather or vandalism will be repaired or replaced as soon as practicable.

General Maintenance

The Contractor will perform the following tasks as general maintenance duties:

- Plant Inspection
- Weed control
- Irrigation water volume and frequency
- General maintenance of irrigation system
- Trash and debris removal
- Pest control
- Plant replacement

Plant Inspection

After initial planting, the Project Biologist will check the mitigation site on a monthly basis through the 18th month. The plants shall be inspected on a quarterly basis thereafter.

Weed Control

The mitigation site shall be maintained free of weeds during the monitoring period. Weed eradication will minimize competition that could prevent the establishment of native species. All maintenance personnel will be trained to distinguish weed species from native vegetation to ensure only weedy species are removed or sprayed with herbicide.

As weeds become evident, they should be immediately removed by hand or controlled with an appropriate herbicide as determined by a licensed Pest Control Advisor (PCA). Weed debris shall be removed from the project area as accumulated and disposed of as permitted by law.

Weeds shall be manually removed before they can attain a height of three-inches (3") at intervals of not more than 30 days for the first two years of the project. All portions of the plant will be removed, including the roots. The Project Biologist shall direct the contractor regarding the selection of target weed species, their location, and the timing of weed control operations to ensure that native plants are avoided to the extent possible. Pulled weeds will be placed on a "mantilla" or other type of tarp to prevent the seeds from coming in contact with the ground.

A cleared space, 18 inches from the base of the plant, will be maintained around each container plant to minimize competition from other plant species. Mulch, two-inches thick within the watering basin, will be maintained throughout the monitoring period. Leaf and branch drop, and organic debris of native species, shall be left in place.

Irrigation Water Volume and Frequency

The contractor shall be responsible for applying sufficient irrigation water to adequately establish new plant materials and germinate and establish the applied seed. Irrigation water shall be applied in such a way as to encourage deep root growth (periodic deep irrigation versus frequent light irrigation). The contractor will allow soil to dry down to approximately 50- to 60-percent of field capacity (in the top six or ten inches after germination and during seedling establishment) before the next irrigation cycle. Wetting of the full root zone and drying of the soil between irrigation events is essential to the maintenance of the plants and the promotion of a deep root zone that will support the vegetation in the years after establishment. Systems may need to be on for as long as six to eight hours at a time in order to get complete water penetration to the lower soil horizons to encourage deep root growth. A soil probe or shovel shall be used to directly examine soil moisture and rooting depth.

General Maintenance of Irrigation System

The contractor will be responsible for the regular maintenance and repair of all aspects of the irrigation system. Poorly functioning or non-functioning parts shall be replaced immediately so as to not endanger the plantings.

General system checks shall be conducted no less than weekly for the first month after installation to ensure the system is functioning correctly and monthly thereafter, except during periods when the irrigation system is not in operation as recommended by the Project Biologist.

Any erosion or slippage of soil caused by the contractor's inadequate maintenance or operation of irrigation facilities shall be repaired by the contractor at his/her expense.

Trash and Debris Removal

The mitigation site shall be well maintained in order to deter vandalism and dumping of trash. The contractor is responsible for avoiding impacts to plantings during trash removal activities. Contractor shall, during daily routine maintenance, manually remove weeds, litter, trash, and debris from the mitigation site and dispose of off-site as permitted by law. Dead limbs and tree fall shall be left in place in the revegetation areas.

Pest Control

Young trees and shrubs will be monitored for signs of disease, insect and/or predator damage, and treated as necessary. Badly damaged plants will be pruned to prevent spreading of the pestilence or replaced in kind if removed. Excessive foraging by predators may necessitate protective screening around plants and/or poison baiting of the predators. The Project Biologist will be consulted on any pest control measures to be implemented.

The contractor shall be responsible for maintaining a rodent-free project. All measures to eradicate rodents must be as directed by a licensed pest control consultant.

Plant Replacement

The installation contractor will be responsible for replacing all container stock plants terminally diseased or dead for 120 days after plant installation. The long-term maintenance contractor will thereafter replace all dead and/or declining plants in the winter months as recommended by the Project Biologist. Replacement plants shall be furnished and planted by the contractor at his/her expense.

Replacement plants shall conform to the species, size requirements, and spacing as specified for the plants being replaced. The replacement plants shall be purchased from inventory at the same native plant nursery as were the contract-grown plant stock.

Fertilization

If nutrient deficiencies are observed during site monitoring, the Project Biologist may specify applications of slow-release pellet fertilizer or soil amendments to speed initial growth or as a remedial measure. These applications shall occur at the onset of the rainy season following the

manufacturer's recommendations. Fertilizer will not be applied other than under the direction of the Project Biologist.

Pruning

No pruning is necessary unless otherwise specified by the Project Biologist. Dead wood shall be left on trees or where it has fallen as it plays an important role in habitat creation and soil formation.

B. Responsible Parties

The Applicant will be responsible for financing and carrying out maintenance activities.

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C. Maintenance Schedule

The mitigation and restoration maintenance and monitoring program will begin with the construction process and continue during the Monitoring Period. Table 4-3 below indicates the schedule of maintenance inspections.

TABLE 4-3 MAINTENANCE SCHEDULE					
Maintenance Task	Year				
	1	2	3	4	5
Plant Inspection	Monthly first 12 months	Monthly through 18th month; quarterly thereafter	Quarterly	Quarterly	Quarterly
Irrigation System Inspection	Monthly or more frequently if required	Monthly	As Required	N/A	N/A
Trash and Debris Removal	Monthly	Quarterly	Quarterly	Quarterly	Quarterly
Weed Control	Minimum of Monthly	Monthly	Quarterly	Quarterly	Quarterly
Pest Control	Monthly	Bi-monthly	Quarterly	Quarterly	Quarterly
Plant Replacement	Annually	Annually	Annually	Annually	Annually
Fertilization (if necessary)	Annually	Annually	N/A	N/A	N/A

VI. MONITORING PLAN

A. Initial Monitoring Effort

The vernal pool watershed expansion/enhancement site and the vernal pool restoration site will be monitored immediately following establishment and 30 days thereafter. The initial biological and ecological status of the mitigation and restoration sites will be established and the as-built condition of the site will be documented. Long-term monitoring of the mitigation and restoration sites will begin following this initial assessment.

B. Performance Criteria

The success of habitat restoration is defined as the restoration of a functional ecosystem. Success is usually measured by percent coverage by target species. Natural habitats rarely exhibit 100-percent coverage but rather include a considerable proportion of open spaces. While this monitoring program uses percent coverage criteria, it is noted that determination of successful coverage is expected to be relative to other similar native habitats typical of the region.

As the vernal pool watershed expansion and enhancement program is intended to mitigate for the loss of existing vernal pool watershed and will be revegetated with native alkali meadow species, the area will be subject to quantitative monitoring and performance criteria. The vernal pool restoration area, however, will be subject to qualitative monitoring only to ensure eradication of

mulefat and non-native species within the pool. Quantitative monitoring will not be conducted within the vernal pools and the vegetative cover will not be subject to performance criteria.

The means of determining successful enhancement for the vernal pool watershed expansion site will be through series of measurements for species composition, exotic species cover, and cover by native species. All of these, except non-native species cover, should increase over time. Cover by non-native species should be the opposite; it should decrease with time, particularly because one of the primary goals of the project is to substantially reduce or eliminate non-native species from the restoration site.

After the initial non-native species eradication and associated planting effort has been completed, the vernal pool watershed expansion site and vernal pool restoration site will be monitored by the project monitor on a monthly basis for the 12 months and quarterly for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization, will be completed during each monitoring visit. General observations, such as fitness and health of the planted species, pest problems, weed persistence/establishment, mortality, and drought stress, will be noted in each site walkover. The Project Monitor will determine remedial measures necessary to facilitate compliance with performance standards.

Data regarding wildlife usage will be collected during each visit.

Quantitative vegetation data for the vernal pool watershed expansion area will be collected annually using accepted vegetative sampling methods in order to evaluate survivorship, species coverage, and species composition.

In the event that plantings should fail to meet the specified requirements, compliance will be ensured by the performance of either or both of the following remedial procedures by the contractor on an as-needed basis as directed by the Project Monitor: (1) replacing unsuccessful plantings with appropriate-sized stock or seed mixes to meet stated cover or survival requirements and /or (2) performing maintenance procedures to ensure the site conditions are appropriate (e.g., non-native species removal). Remedial actions in planting areas shall be based on detailed investigations (such as soil tests and excavations of failed plantings to examine root development) to determine causes of failure.

Performance criteria for the vernal pool watershed expansion and enhancement area will be as follows:

First-Year Monitoring

Success Standard: 40-percent coverage of native species (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 10-percent coverage by non-native shrubs species; and
No more than 20-percent coverage by non-native annual species

Second-Year Monitoring

Success Standard: 50-percent coverage of native species, (<5-percent deviation allowed);
At least 80-percent of the planted species will be represented in the restoration site;
No more than 5-percent coverage by non-native shrubs species; and
No more than 15-percent coverage by non-native annual species

Third-Year Monitoring

Success Standard: 65-percent coverage of native species, (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrubs species; and
No more than 15-percent coverage by non-native annual species

Fourth-Year Monitoring

Success Standard: 75-percent coverage of native species, (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrub species; and
No more than 10-percent coverage by non-native annual species

Fifth-Year Monitoring

Success Standard: 80-percent coverage of native species, (<5-percent deviation allowed);
At least 80-percent of the planted species will each attain at least 5-percent cover of the total native cover;
No more than 5-percent coverage by non-native shrub species; and
No more than 10-percent coverage by non-native annual species

C. Monitoring Methods

Monitoring will assess the attainment of annual and final success criteria and identify the need to implement contingency measures in the event of failure. Monitoring methods include an annual tally of dead and/or declining plant stock and visual estimates of cover as well as field sampling techniques that are based in accordance with the methodology developed by the California Native Plant Society (CNPS).¹³ Please refer to *A Manual of California Vegetation* for further details on this sampling method.

Sampling Techniques

Quantitative sampling within the vernal pool watershed expansion/enhancement site will be performed using one-meter quadrats that will be placed randomly throughout the site. Placement of quadrats will be determined using random numbers tables to provide two coordinates – one that indicates the distance along a longitudinal centerline bisecting the site and one that determines the distance from the line. Plots will be placed on alternating sides of the centerline and perpendicular to the centerline. Vegetative cover will be visually estimated within the quadrat for each species present and recorded on a data sheet. Any species observed during the sampling that does not fall within a quadrat will be recorded and included on the list of species for the restoration site. At least 30 replicates will be initially sampled. Sample variance from data collection in years one through three will be used to determine if 30 samples are adequate. If a power analysis indicates that more than 30 samples are required, additional transects or quadrats will be added. If power analysis indicates that fewer than 30 samples are required, the number of quadrats will be reduced. Sampling will be conducted with sufficient replication to detect a 10% difference in absolute ground cover between the mean of the restoration and the success standard with 90% power at an alpha level of 0.10. The mean native cover for the restoration site will be compared to the performance criteria at the end of five years using an appropriate inferential test such as a single-sample t-test. The mean cover for the restoration site will be considered to meet the performance criteria if the resulting alpha level is greater than 0.10.

Photo-Documentation

Permanent stations for photo-documentation will be established during the first annual monitoring event. Photos shall be taken each monitoring period from the same vantage point and in the same direction each year and shall reflect material discussed in the annual monitoring report.

Qualified habitat restoration specialists, biologists, or horticulturists with appropriate credentials and experience in native habitat restoration shall perform monitoring. Continuity within the personnel and methodology of monitoring shall be maintained insofar as possible to ensure comparable assessments.

¹³ Sawyer, John O. and Todd Keeler-Wolf. 1995. *A Manual of California Vegetation*. California Native Plant Society.

Monitoring Period

The Monitoring Period shall last until whichever of the following occurs first: (a) five years from the installation of a mitigation site or (b) until the Project Biologist has determined, with resource agency concurrence, that the fifth-year success standard has been achieved for specific mitigation areas and, additionally, that such areas are self-sustaining in the absence of irrigation for a minimum of three years.

Qualitative Monitoring

The Project Biologist will conduct qualitative monitoring surveys on a monthly basis for the first 18 months and quarterly thereafter for the remainder of the monitoring period. Qualitative surveys, consisting of a general site walkover and habitat characterization, will be completed during each monitoring visit. General observations, such as fitness and health of the planted species, pest problems, weed establishment, mortality, and drought stress, will be noted in each site walkover. The Project Biologist will also note observations on wildlife use and native plant recruitment for the purpose of later discussion in the annual reports. Records will be kept of mortality and other problems such as insect damage, weed infestation, and soil loss. The Project Biologist will determine remedial measures necessary to facilitate compliance with performance standards.

D. Annual Reports

At the end of each of the growing seasons during the Monitoring Period an annual report will be prepared. These reports will be “cumulative” including the results from previous annual reports and will assess both attainment of yearly target criteria and progress toward final success criteria. These reports will include the following:

- a list of names, titles, and companies of all persons who prepared the content of the annual report and participated in monitoring activities for that year;
- an analysis of all qualitative monitoring data;
- copies of monitoring photographs;
- maps identifying monitoring areas, transects, and planting zones; and
- copies of previous reports

E. Schedule

Annual Reports will be submitted to the appropriate agencies by December 31 of each year for the year in which quantitative sampling was performed.

VII. COMPLETION OF MITIGATION

Upon completion of the Monitoring Period for the mitigation sites, the Applicant will notify the City, Corps, CDFG, CCC, and USFWS by submitting a Final Monitoring Report that documents this completion. Following receipt of the final report, the Applicant will, at the request of the City, Corps, CDFG, CCC, and USFWS, provide access and guidance through the mitigation and restoration sites to confirm the adequate completion of the mitigation.

VIII. CONTINGENCY MEASURES

A. Initiating Procedures

If a performance standard is not met for any mitigation site or sites in any year or if the approved success criteria are not met, the Project Biologist will prepare an analysis of the cause(s) of failure and, if determined necessary by the City, Corps, CDFG, CCC, and USFWS, propose remedial actions for approval. If any mitigation site has not met one or more of the success criteria or performance standards by the end of the Monitoring Period, the responsible party's maintenance and monitoring obligations shall continue until the above-referenced agencies each gives final approval that the mitigation obligations have been satisfied. It is therefore incumbent upon the Project Biologist to foresee project deficiencies as part of the monitoring program and take appropriate steps to address the situation.

B. Funding Mechanism

The Applicant will fund planning, implementation, maintenance, and monitoring of any contingency measures that may be required to achieve mitigation goals.

C. Responsible Parties

The Applicant will be responsible for implementing, maintaining, and monitoring any contingency procedures.

Newport Banning Ranch LLC
1300 Quail Street, Suite 100
Newport Beach, CA 92660
Contact: Mike Mohler
Phone: (949) 833-0222
Fax: (949) 833-1960

SECTION 5. OIL FACILITIES BUFFER AND WATER QUALITY BASIN PLANTINGS

I. PROPOSED PLANTINGS

As part of development of the project, the existing oil facilities on site, which now cover much of the lowland and upland areas, will be consolidated into two small areas in the lowlands. The perimeter of the oil consolidation areas will be planted with native screening trees such as Fremont cottonwood (*Populus fremontii*) and willow (*Salix* sp.). The final plant palette for the oil consolidation buffers will be developed in consultation with and subject to the approval of the project biologist.

The proposed project includes three water quality basins. One of the basins will be located at the top of the large arroyo, and the other two basins will be located in the lowlands. All three of the basins will be designed to provide riparian habitat function in addition to wetland and riparian areas being created/restored for mitigation. The basins will be vegetated with a mix of emergent marsh species in the wetter parts of the basin and facultative species in the drier parts of the basins, including the slopes, depending on the expected hydrological regime of each basin. The final plant palette for the water quality basins will be developed in consultation with and subject to the approval of the project biologist. Table 5-1 below lists plants that may be used in the water quality basins.

TABLE 5-1 POTENTIAL WATER QUALITY BASIN PLANT PALETTE	
Botanic Name	Common Name
<i>Bolboschoenus maritimus</i>	Alkali bulrush
<i>Schoenoplectus americanus</i>	Olney's bulrush
<i>Juncus mexicanus</i>	Mexican rush
<i>Juncus acutus</i>	Southwestern spiny rush
<i>Eleocharis macrostachya</i>	Creeping spikerush
<i>Baccharis douglasii</i>	Douglas' Baccharis
<i>Baccharis emoryi</i>	Emory's Baccharis
<i>Artemisia douglasiana</i>	Mugwort
<i>Rubus ursinus</i>	California blackberry
<i>Rosa californica</i>	California rose
<i>Frankenia salina</i>	Alkali Heath
<i>Distichlis spicata</i>	Saltgrass
<i>Heliotropium curassivicum</i>	Seaside Heliotrope
<i>Malvella leprosa</i>	Alkali sida
<i>Pluchea odorata</i>	Saltmarsh fleabane
<i>Epilobium ciliatum</i>	Willowherb
<i>Ambrosia psilostachya</i>	Western Ragweed

**MONITORING SHEET -
QUALITATIVE EVALUATION**

Project Name: _____
Date: _____

Recorders: _____

Plant Health - General

Are there visible signs of nutrient/water deficiencies? If yes, then describe:

Are there signs of regeneration/reseeding?

Is vandalism harming plant health or project success?

Are there any signs of herbivory?:

Other:

Container Stock

Provide visual estimation percent survival of container stock:

Are watering basins intact?:

Is mulch from original installation still present? Is there litter development?:

Seeded Species

Are all intended native species present? If not, then what is missing?:

Are there any occurrences of volunteer native species?:

Are there any unvegetated areas? Should these be remediated?:

Weeds

Is excessive competition from weeds affecting desired species?:

Is there adequate maintenance/weed clearing?:

Other:

Soils

Are there any signs of soil development?:

Other:

Irrigation System

Are irrigation heads functioning properly?:

Are there any signs of rodent damage to irrigation system?:

Are there any signs of vandalism to the irrigation system/controller box?:

Are there any signs of excessive runoff?:

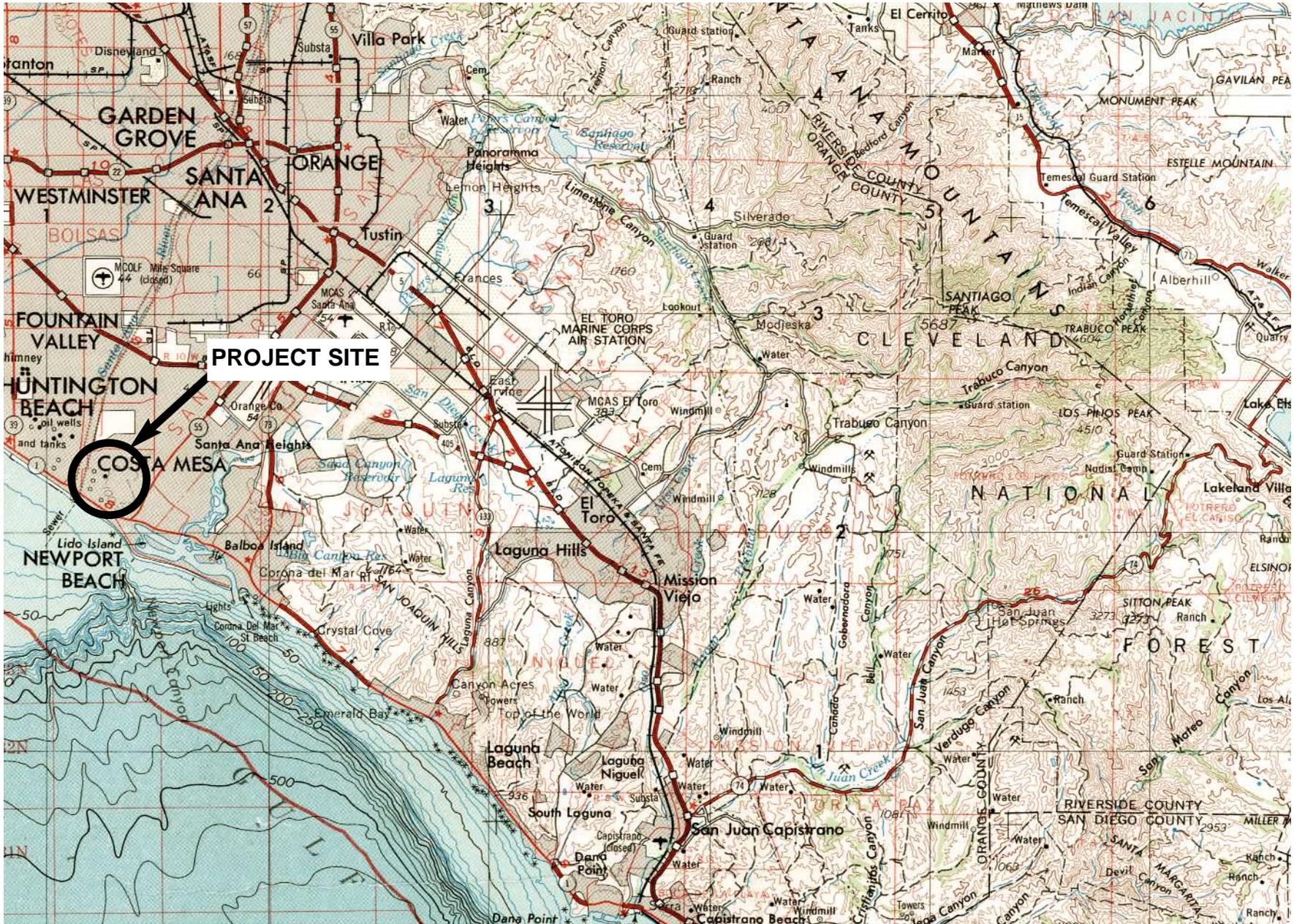
Does irrigation frequency and volume require adjustment?

Other:

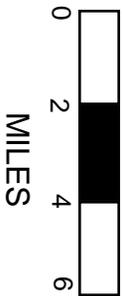
Is there any indication that wildlife is using the site?:

Recommendations for Remediation:

Adapted from USGS Santa Ana
Quadrangle



NORTH
↑



BANNING RANCH

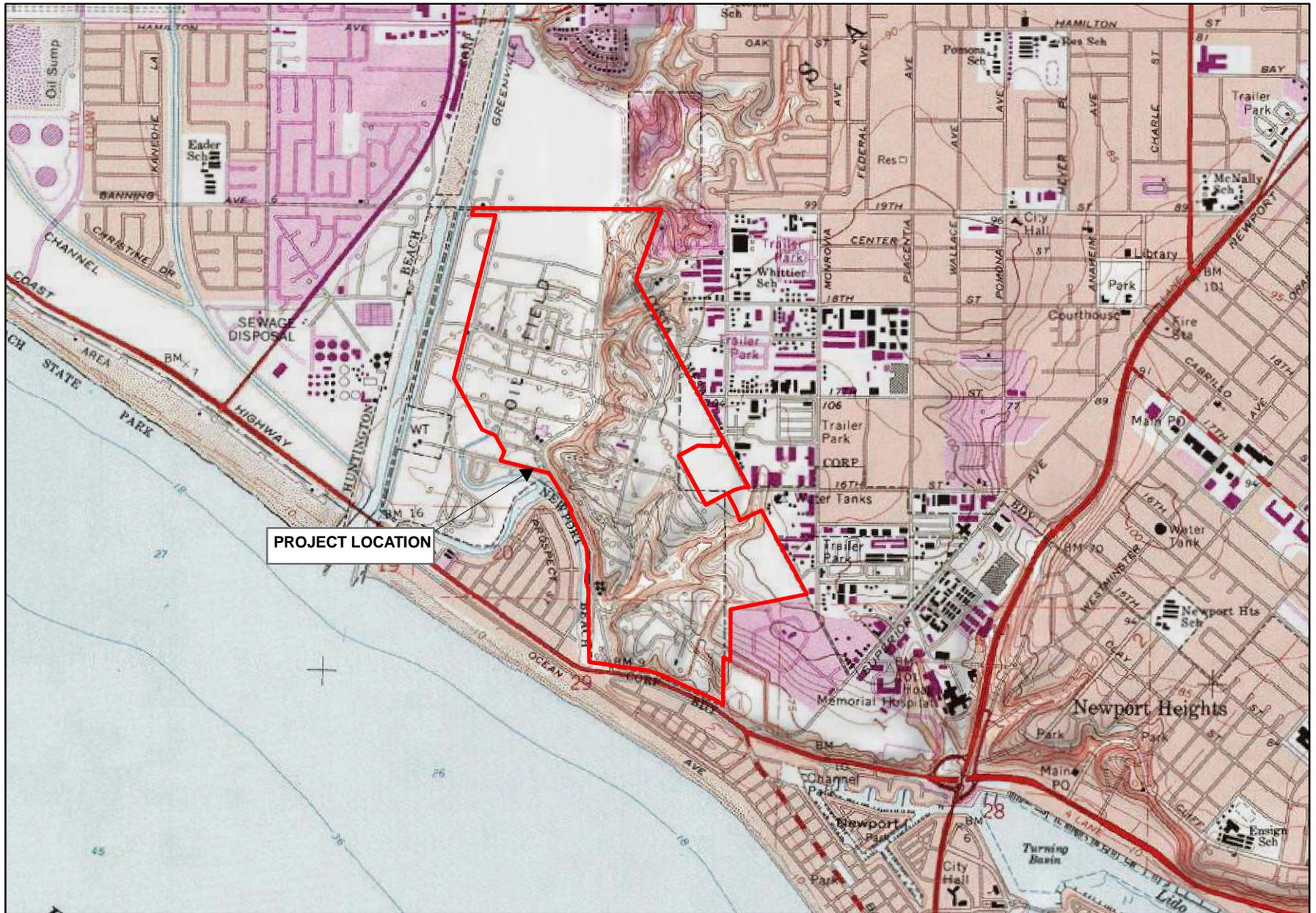
Regional Map

GLENN LUKOS ASSOCIATES

EXHIBIT 1



Adapted from USGS Newport Beach quadrangle



BANNING RANCH

Vicinity Map

GLENN LUKOS ASSOCIATES

Exhibit 2



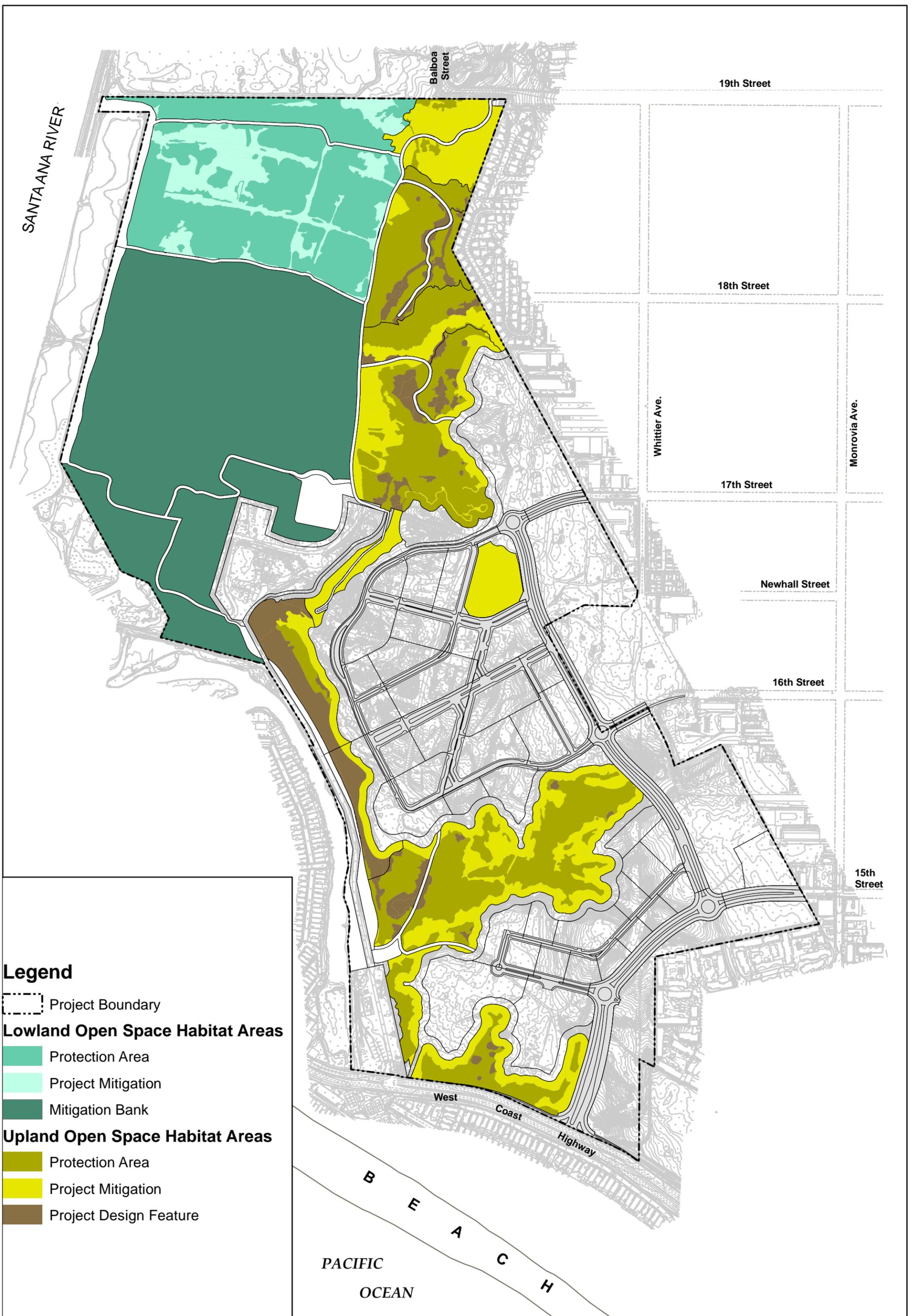
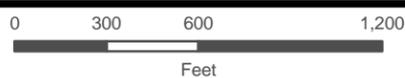


Exhibit 3

Lowland and Upland Open Space Habitat Areas Map



GLENN LUKOS ASSOCIATES



January 14, 2009

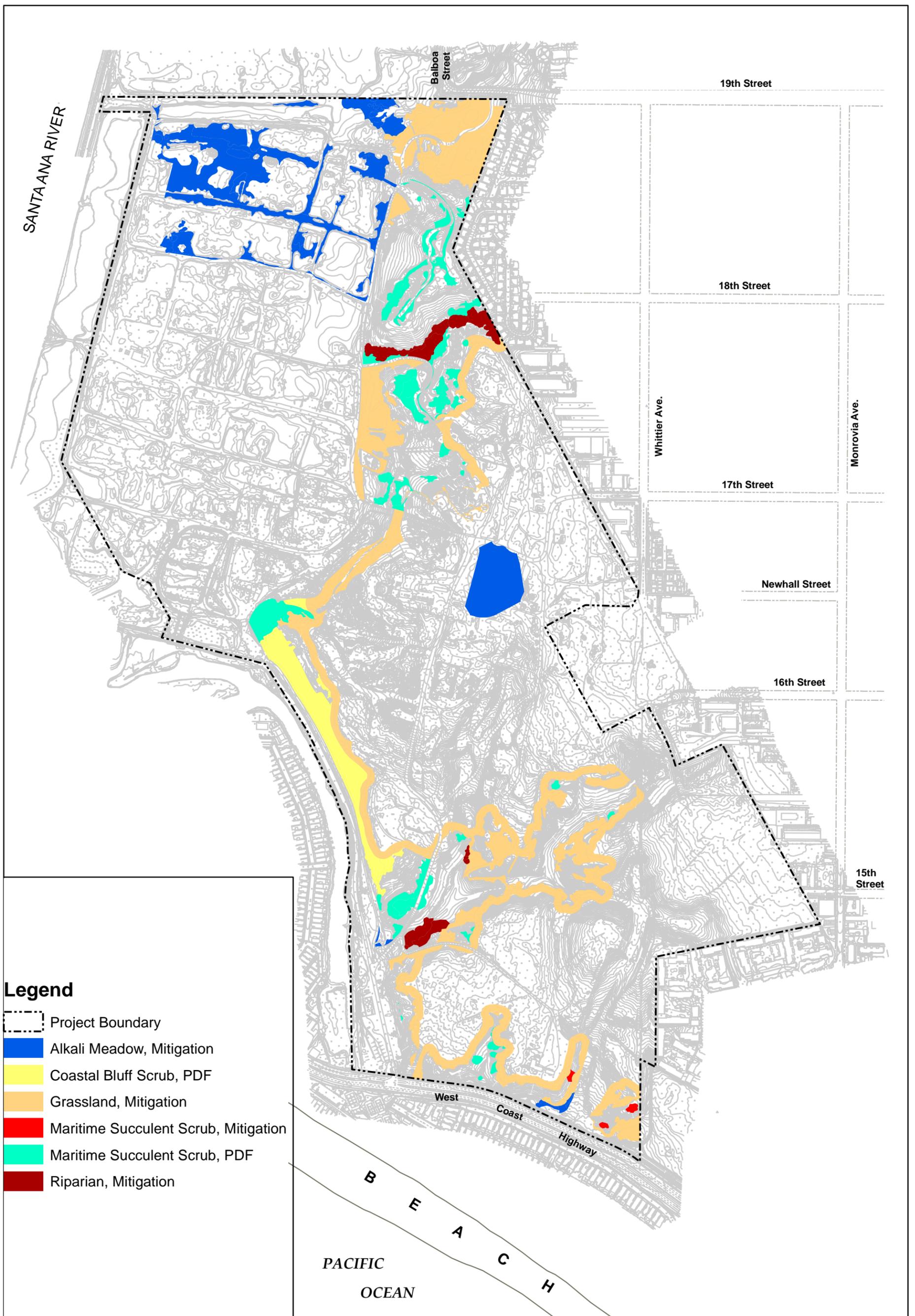
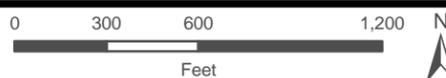


Exhibit 4

Habitat Restoration Map



GLENN LUKOS ASSOCIATES



January 14, 2009

