NORTHERN SUBAREA RECOMMENDATIONS

as presented in the

City of Oxnard Ormond Beach Specific Plan Area Raptor Foraging Habitat Restoration Project Adaptive Management Plan

(February 24, 2011)

Red type = Specific recommendations/requirements for the Northern Subarea
Black type = General recommendations/requirements for both subareas

Mitigation Requirements

The total mitigation requirement for the Northern Subarea is 30.2 acres of foraging habitat.

Northern Subarea Mitigation Requirements and Proposed Onsite/Offsite Mitigation

Total Avian Foraging Habitat Mitigation Required[1]	Required Wet Herbaceous Habitat Mitigation	Required Upland Mitigation	Area Available Onsite for Wet Habitat Mitigation	Area Available Onsite for Upland Mitigation	Offsite Area Needed to Fulfill Upland Mitigation Requirement
30.2 acres	0.0	30.2 acres	0.0	10.2 acres	20.0 acres

Mitigation Option 1: All or Partial Onsite Restoration

Under Mitigation Option 1, a portion of the Northern Subarea proposed open space areas will be used to fulfill a portion of the Northern Subarea requirement for raptor foraging habitat restoration (Figure 4). The following three measures would meet the ***30.2-acre*** upland restoration requirement:

1. All upland open space land immediately west, south, and east of the shoreline of Lake SouthShore will be planted with native transitional species near the shoreline, transitioning to upland grassland species with patches/hedgerows of native shrubs and trees. This will be implemented in three specific sections of open space areas adjacent to Lake SouthShore:
   - 1.8 acres surrounding the southern and western corner of the western lake section.
   - 4.1 acres between the southern margin of the middle lake section and Hueneme Road.
   - 2.4 acres surrounding the southern and eastern corner of the eastern lake section.

   These areas provide a total of approximately ***8.3 acres*** of upland raptor foraging habitat restoration area.

2. In addition to the three locations mentioned above, the detention basin proposed north of the middle lake section island will also be used as a restoration area for upland raptor foraging habitat. Per the applicant, this area has been designed to receive overflow from the lake only when storm events reach a 10-year magnitude recurrence interval or greater. Lake overflow is designed to spill into the basin, which would then drain back into the lake as the lake level recedes. The basin, as proposed, will not require any dredging or vegetation clearing because the drainage system routed to it is not expected to transport significant amounts of sediment. Lake overflow into the basin is designed to reside only for a short time. The total area of this detention basin therefore available for upland raptor foraging habitat is approximately ***1.9 acres***.

3. The remaining ***20 acres*** required to meet the mitigation requirement of 30.2 acres of upland raptor foraging habitat for the Northern Subarea will need to be implemented at an offsite location (offsite mitigation is discussed in detail in Mitigation Option 2 below).

Mitigation Option 2: All Offsite Restoration

Under Mitigation Option 2, all 30.2 acres of raptor foraging habitat restoration required for impacts associated with the Northern Subarea would be implemented at an offsite location. If the onsite portion of this mitigation requirement cannot be fulfilled, or if it is determined that no onsite raptor foraging habitat mitigation is feasible due to constraints from development or proximity to human landscapes and influences, this option outlines measures necessary to implement sufficient and successful compensatory offsite mitigation.

Provide compensatory mitigation offsite through the private purchase of mitigation lands. This process typically entails the following tasks:

1. Identification of parcels that contain at minimum suitable raptor habitat characteristics.
2. Purchase of an adequate acreage to compensate for project-specific impacts.
3. Preparation of a long-term Habitat Management Plan to maintain and enhance the conservation values of the conserved land in perpetuity.
4. Recordation of a conservation easement or similar instrument that provides legal preservation of the conserved land in perpetuity.
5. Identification of a funding assurance mechanism, such as a letter of credit and/or endowment, for the purchase and long-term management of the conserved land in perpetuity.
6. Coordination with the regulatory agencies, including CDFG and the USFWS, to obtain approval of the proposed compensatory mitigation approach, including the mitigation lands, Habitat Management Plan, conservation easement, and funding assurances.

Habitat Functions to be Restored

In order to restore raptor/bird foraging habitat function as required, all on- and off-site mitigation will be implemented in accordance with the approved AMP and installation program. The restoration areas will be maintained and monitored for a minimum of three years and would be subject to success criteria and triggers for adaptive responses.

The habitat functions expected to be replaced include:

- Maintain habitat viability in terms of normal growth/development of functional habitat.
- Increase resources without resource depletion so that the habitat can continue to thrive into the future without external infusions of resource.
- Increase native cover and species richness with the creation of low-growing native and naturalized grassland habitat with native shrub shelterbelts.
- Increase perching and nesting opportunities with the establishment of small clusters of large trees.
- Maintain some habitat connectivity to other open space areas for prey recruitment.
- Increase small mammal populations in particular as prey for the target raptors. It is noted that natural vegetation will also provide for increases in the abundance of other prey animals (reptiles, invertebrates, birds), but the focus of the mitigation effort is on small mammals.

Implementation Schedule

Per Mitigation Measure BIO-2 of the certified OBSP FEIR, the restoration project shall be initiated prior to the completion of the proposed development to ensure there is no significant temporal loss of foraging habitat for raptors and shorebirds. Site preparation and irrigation system installation will be conducted prior to planting implementation. All restoration planting installation should be conducted during the first wetting rains from October 1 to February 1. All planting installation will occur when the top six inches of soil are moist following a series of winter/spring storms, or as supplemented by temporary irrigation. As-built conditions will be reported immediately following the completion of installation. Each individual restoration effort must be monitored and maintained for a minimum of a three-year period and until success criteria are met.

Site Preparation

Any non-native invasive plant species within the restoration site will be removed prior to planting of native vegetation. Use of herbicides will likely not be needed if the restoration areas are maintained frequently to prevent colonization of undesirable species. Immediately following irrigation installation, the restoration areas will be planted with native species by direct planting methods and broadcast seeding methods. A project restoration biologist should be contracted to identify specific planting locations of native vegetation for optimal establishment and longevity based on anticipated hydrology, edaphic factors, exposure, and slope aspect. A vegetative cover consisting of appropriate native plant species will develop slowly from the planted material over a minimum of three growing seasons with proper management.

Planting Plan

Planting plans to be developed by the subarea applicant shall include an assemblage of native plant species, such as those recommended in Table 2 of the AMP, that are known to occur within raptor foraging grassland, scrub, and transitional habitats. In general, the planting plan includes container plantings in addition to broadcast seeding of native species. The majority of the restoration required will concentrate on the development of native grassland habitat, and

will include clusters and hedgerows of native scrub stands and emergent isolated native trees. Container plantings to be installed in the restoration area are to be spaced irregularly and in clusters to emulate natural conditions. A restoration biologist should provide advice for the implementation of the plantings and to aid the subareas in achieving the goals of FEIR Mitigation Measure BIO-2.

The restoration proposed within the Northern Subarea includes upland mitigation areas (1) south of Lake SouthShore and north of Hueneme Road, and (2) within the proposed detention basin (Figure 4). Mitigation areas along the *lake shoreline* will be planted with transitional plant species (Planting Zone B [Table 2, Figure 6]), including western ragweed, scarlet monkeyflower, mugwort, saltgrass, alkali rye grass, and deer grass. Grassland species (Planting Zone C) will be planted where the mitigation site progresses from the lake margin to the north edge of Hueneme Road, and will include species such as narrow-leaved milkweed, blue wild rye, California poppy, and purple needlegrass. The lower elevations within the Northern Subarea *detention basin* will be planted with transitional species (Planting Zone A), and the higher elevations of the detention basin will be planted with grassland and shrub species (Planting Zones B and C).

Scrub shelterbelts with native emergent trees (Planting Zone D) will also be designed within the Northern Subarea habitat mitigation areas. Specifically, scrub shelterbelts will be implemented to create cover and foraging resources for raptor prey species and to create low perches for raptors. The scrub species recommended in these shelterbelts include California sagebrush, coyote brush, ashy-leaf buckwheat, deerweed, bush monkeyflower, lemonade berry, and sages. Less than 10% of the total foraging habitat being created shall be comprised of shrubs to maintain the goal of creating open foraging habitat.

Planting Installation Specifications

Planting installation, maintenance, monitoring, and reporting activities will be overseen by a restoration biologist familiar with restoration of native plants and habitats. All plantings will be planted in randomly spaced, naturally clumped patterns. The planting density should be augmented by approximately 25% to compensate for anticipated planting mortality. The size, location, and variety of the plantings shall be based on professional judgment of a qualified biologist, and will depend on the available mitigation area and opportunity for survival of planted species. Container stock specifications, installation methods, seed broadcast methods, herbivore protection, and mulch applications shall follow the recommendations presented in the approved AMP.

Irrigation Plan

A detailed landscape irrigation plan shall been prepared specifically for the various planting zones within each mitigation site. A temporary above-ground irrigation system will be provided to initiate seed germination and promote proper container/cutting root establishment. The mitigation areas will be watered by an irrigation system, made up of multiple impact sprinkler or gear driven overhead sprinklers, to mimic the natural water cycle in the region. The intent of irrigation is to reduce mortality and increase the growth rate of plant materials during the first few months following planting and during the dry season. Irrigation will be provided for a period of approximately two years from planting (depending

on climatic conditions), with irrigation being phased out during the fall/winter of the second year, unless unusually severe conditions threaten planting survival.

As-Built Conditions

Following plant installation, the project restoration biologist will assist in the preparation of a general as-built restoration and planting plan and will oversee the implementation of the monitoring program. As-built planting plans will be used as baseline information to track the success of container plantings and seeded areas throughout the monitoring period. The as-built plan will document any changes made during implementation, and will outline any modification made that deviate from this implementation plan to reflect as-built conditions.

Maintenance Schedule

Each mitigation site must be monitored and maintained for a minimum of a three-year period and until success criteria are met. If success criteria are not achieved by the end of the third year, maintenance and monitoring shall continue a maximum of two additional years for a total monitoring period of five years. The maintenance schedule for the habitat restoration sites will be monthly for the first year, and every other month for the second and third year. Weeding will be conducted, as needed, to prevent displacement of native species, which may include treatment or removal several times per year. All trash and foreign material will be removed regularly from the restoration site. Irrigation system maintenance will occur as needed to meet the goals of this plan.

Weed Abatement Program

Table 3 in the approved AMP provides a list of example common invasive plant species that shall be removed from the project site during site preparation and throughout the maintenance period. Control of invasive plant species will be overseen by qualified individuals experienced with habitat restoration techniques, and experienced with native-versus-nonnative plant species identification, to aid in the establishment of habitat function onsite. Weeding will be conducted by hand monthly the first year and every other month during the last two years of the three-year monitoring period, or until it is determined that the installed plantings are not at risk from competition by invasive plants. Weed control activities will be intensified during the spring and early summer prior to the development of mature seeds produced by the target weed species. Invasive plant materials will be disposed of in a manner and location as to prevent re-establishment.

Monitoring Schedule

For a minimum of three years after installation of this restoration plan, a biological monitor will monitor the mitigation area twice yearly, beginning in the spring or fall after installation of the vegetation and raptor enhancements have been completed (whichever season comes first). Sampling of the replaced and reconstructed habitats shall be conducted during those seasons for assessing peak growth for upland, transitional, and hydrophytic vegetation, accurate identification of plant species, and site conditions such as drought and inundation. The monitoring approach and methods will follow those detailed in the approved AMP. An annual monitoring report documenting the results of each fall mitigation monitoring session will be

submitted by December 1st for the years 2017, 2018, and 2019. If success criteria are not achieved by the end of the third year, monitoring shall continue a maximum of two additional years for a total monitoring period of five years.

Performance Standards and Success Criteria

The following criteria will be used to aid in determining success over the three-year monitoring period:

- No more than 10% cover by weedy/invasive plant species after three years.
- 50% cover by native plant species after two years and 70% percent native cover after three years.
- At least 5 native plant species comprising dominant vegetative cover after three years.
- Observations or detections of rodents and/or raptors inhabiting or foraging within the restoration sites every monitoring year.

Triggers for Adaptive Responses

The triggers for remedial adaptive actions include the following:

- Greater than 25% planting mortality after planting or in any monitoring year in any mitigation area
- Greater than 10% cover by invasive plant species in any monitoring year in any mitigation area
- Less than 50% native cover in any monitoring year in any mitigation area
- Pest problem (house/feral cats, raccoons, etc. hunting or feeding on target prey species) detected or observed in any monitoring year in any mitigation area
- Insufficient rodent recruitment after the first monitoring year in any mitigation area
- No raptors frequenting/foraging anywhere within the mitigation sites after the second monitoring year

Response Actions

The following presents the specific response action that should be implemented when one or more triggers are set.

Trigger 1: Greater than 25% of the planted and seeded material fails to germinate or dies after planting or in any year, and/or the native percent coverage within the restoration sites is less than 50% during any monitoring period.

> **Response Action 1:** To attempt to increase planting survival and native percent cover, maintenance and remediation will include, but are not limited to, replanting problem areas with seed and plant mixtures specifically designed to overcome the identified problem; identifying and controlling invasive plant species; and modifying the irrigation program. The recommended panting palette and restoration plan provided above will be reinstalled where needed to increase survivability and native percent cover. Because

supplemental irrigation will be available within the restoration areas, remedial seeding and planting can take place near the end of the first growing season or at the start of the second growing season, depending on the extent of the activity. Any replacement plantings installed to achieve the requirements will be monitored with the same survival and growth requirements for two years after planting. Any implemented remedial measures will be fully documented in the annual reports.

Trigger 2: The weedy/invasive vegetative cover within the restoration sites is greater than 10%.

Response Action 2: Weed abatement will be increased to a monthly schedule for the remaining monitoring years. Depending on the level of disturbance by invasives, and the species of concern, the weed abatement program would be intensified to attempt to eradicate the species from the restoration sites.

Trigger 3: Evidence of a substantial pest problem (i.e. house/feral cats or raccoons) is observed (pest observed hunting or feeding on target prey species) or detected (numerous remains of prey species found) during any monitoring year.

Response Action 3: To address a pest problem affecting target prey species, trapping of such pests will be conducted to either eradicate or relocate pests from restoration areas, if feasible.

Trigger 4: Natural small mammal recruitment and foraging by target raptor species is not evident in the restoration areas. No target prey species are being observed or detected (i.e. burrows or scat) within the restoration areas.

Response Action 4a: Response Action 1 would be implemented to enhance the restoration effort to attract the raptor prey mammal to the restoration areas.

Response Action 4b: If after one year of increasing maintenance and implementing remediation measures no natural recruitment of target prey species is observed/detected, trapping will be conducted within the restoration areas onsite and/or offsite to determine presence/absence and to quantify small mammal populations inhabiting the restoration areas.

Response Action 4c: If after remediation measures conducted under Response Action 4a yields no target raptor prey species, and if trapping conducted under Response Action 4b within the restoration areas yield no or insufficient prey species, then small mammal trapping of such species would be conducted in an offsite location (such as an area with a predetermined native rodent problem). Those captures would be relocated into restoration areas. Once introduced onsite, prey species would likely flourish in the unoccupied restored habitats. This would provide a prey base for target raptor species.

Trigger 5: It is demonstrated after five years of maintenance and monitoring (including the three initially required years plus two additional remediation years) that onsite mitigation is infeasible due to the constraints associated with urban development, and/or that ultimately a higher level of ecological functioning would result from offsite mitigation.

Response Action 5: The portion of the restoration effort that failed, or the entire restoration effort, shall be re-implemented entirely offsite at an appropriate and superior location. The new restoration effort will be implemented in accordance with this adaptive management plan and implementation plan and will be maintained and monitored for a minimum three-year monitoring period. Partial credit may be given for portions of the initial restoration effort onsite and/or offsite, depending on the status and function of the habitats created at the end of five years.

Documentation Requirements and Reporting

Annual Adaptive Management Reports will be submitted to the City of Oxnard by January 31 of each year following habitat restoration implementation. Reports will be prepared by the project restoration biologist conducting the onsite monitoring. The format and required content of the Annual Adaptive Management Reports should follow the documentation and reporting requirements outlined in the approved AMP.

Success and Closure

The habitat restoration will only be considered complete after a minimum period of three years or until restoration success has been achieved and documented for a maximum of five years. If any portion of the onsite and/or offsite mitigation effort fails after a maximum of five years of maintenance, monitoring, and contingency measures, the portion that failed shall be implemented offsite at an appropriate or superior location and be maintained and monitored for a three-year monitoring period. The final monitoring report shall evaluate the success of the restoration effort in achieving the final success criteria. The final monitoring report will be notification of when the monitoring period has been completed and the approved success criteria have been met. The habitat restoration will only be considered complete by the City of Oxnard when they provide written verification of habitat restoration success.

Cost Recovery for Contingency Actions

If the restoration effort begins to fail and adaptive responses are triggered, the cost recovery for the contingency/response actions shall be the responsibility of the property owner in which the response actions were implemented. A performance bond shall also be established for the cost of full re-installation as presented above under the Habitat Restoration Implementation Plan Cost Estimate subsection in the event that the restoration project fails and is required to be re-installed.

City of Oxnard

Ormond Beach Specific Plan Area Raptor Foraging Habitat Restoration Project

Adaptive Management Plan

February 24, 2011

ADAPTIVE MANAGEMENT PLAN

CITY OF OXNARD
ORMOND BEACH SPECIFIC PLAN AREA
RAPTOR FORAGING HABITAT RESTORATION PROJECT

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ADAPTIVE MANAGEMENT PLAN

CITY OF OXNARD ORMOND BEACH SPECIFIC PLAN AREA RAPTOR FORAGING HABITAT RESTORATION PROJECT

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1.0 INTRODUCTION

This Adaptive Management Plan for biological mitigation is required as part of the Ormond Beach Specific Plan (OBSP) Area that is proposed to be annexed to the City of Oxnard (City). Per City Resolution No. 13,775, dated March 23rd, 2010, the City certified the OBSP Final Environmental Impact Report (FEIR) No. 05-03 (SCH #2005091094) and added Item No. 4, which requires the preparation of an Adaptive Management Plan to be comparable to FEIR Biology Mitigation Measure No. 2 regarding creation and/or restoration of raptor foraging habitat. Specifically, Item No. 4 of said Resolution states that:

> *"The City Council shall, at the time it considers approving the Ormond Beach Specific Plan Projects, consider adopting an Adaptive Management Plan which identifies mitigation that is comparable to Biology Mitigation Measure No. 2 recommended in the EIR regarding the creation and/or restoration of raptor foraging habitat. Specific mitigation identified in the Adaptive Management Plan shall consist of open space and/or fees to be determined by the Development Agreements for the Ormond Beach Specific Plan Projects and the City shall be designated the agency responsible for carrying out said mitigation."*

The Adaptive Management Plan outlines the necessary requirements and procedures to meet the biological mitigation necessary to offset impacts to biological resources, specifically coastal raptor and general avian foraging habitat. The purpose of this document is to create a cohesive plan that will mitigate the raptor foraging habitat impacts identified in the OBSP by the FEIR and to outline the necessary steps for property owners to achieve required mitigation within the OBSP area or within adjacent qualifying habitat areas. This plan provides the detail for addressing elements commonly found in adaptive management programs used for natural biological resource management (Lee 1999) and ecosystem restoration (Thom 1997). Accordingly, this plan includes information and instruction regarding adaptive contingency measures should the initial program be unsuccessful. In addition, this plan addresses a possible fee structure to be implemented as part of the development agreements. Consistent with the OBSP, this Adaptive Management Plan addresses the northern and southern portions of the plan area independently as well as collectively.

Ormond Beach Specific Plan Area Overview

The 917-acre OBSP area consists of two planning subareas, all of which is currently in agricultural production and is regularly tilled (Figure 1).

The northerly portion of the greater OBSP area is termed the SouthShore OBSP Area (herein referred to as the Northern Subarea). This Northern Subarea is approximately 321.8 acres and encompasses unincorporated land in south Oxnard. SouthShore adjoins the corporate limits of the City of Oxnard to the north and west, and lies within the City's Sphere of Influence as determined by the Ventura County Local Area Formation Commission (LAFCO).

The southerly portion of the greater OBSP area is termed the South OBSP Area (herein referred to as the Southern Subarea), and covers the area south of Hueneme Road. This Southern Subarea is approximately 595 acres. Approximately 230 acres at the southernmost area of the Southern Subarea are currently in agricultural production as sod farms and are adjacent to sensitive wetland and dune habitat at Ormond Beach. This 230-acre area is proposed to continue in agricultural use and would not be annexed to the City. Together, these specific plans comprise the larger OBSP area, yet remain distinct from one another to reflect different land ownerships, land uses, and development schedules.

Figure 1 Location Map

Existing Condition of Subareas

The Northern Subarea consists of row crop agriculture and has adjacent residential development to the north. It provides only some limited habitat value due to these disturbances, and Hueneme Road along the southern boundary serves as a partial deterrent to wildlife entering the Northern Subarea from habitats south of Hueneme Road. Besides the agricultural crops, vegetation in the Northern Subarea includes drainage ditches containing predominantly weedy, non-native species such as cheeseweed (*Malva parviflora*), London rocket (*Sisymbrium irio*), black mustard (*Brassica nigra*), white sweet clover (*Melilotus albus*), and non-native grasses. The ditches draining the Northern Subarea are located along the north side of East Hueneme Road and the east side of Olds Road.

The Southern Subarea consists of sod farms that provide some habitat for foraging raptors, and it is adjacent to sensitive habitats at Ormond Beach. Habitat value in the Southern Subarea is substantially limited by the agricultural disturbances associated with sod farming. Besides the cultivated sod, ruderal vegetation occurs along the margins of the cultivated areas and roads, usually in connection with the drainage ditches that convey water through the area. The drainage ditches are vegetated with weedy, non-native herbs and grasses. The ditches draining the Southern Subarea are located east of Arnold Road and east of Edison Drive. Oxnard Drainage District (ODD) Canal #3, a larger channel, flows along the southern boundary of the Southern Subarea between the agricultural fields and Ormond Beach. ODD Canal #3 will remain in the active agricultural land. The drainage along Arnold Road has some trimmed cattails on the southern end, and along the southern end of Edison Drive the ditch becomes dominated by California bulrush (*Schoenoplectus californicus*) as it joins the California bulrush-dominated channel that traverses along the southern end.

Project Impacts

The Final OBSP EIR states that the long term buildout of the Specific Plan will result in the urban development of 677 acres of agricultural lands that function as limited foraging habitat for raptors, shorebirds, migratory waterfowl, and other birds. The habitat value of the agricultural lands is similar to that which grasslands and open shrublands can provide, but because of the ongoing disruptions associated with agricultural practices, the actual value in terms of native vegetation and available prey is substantially reduced. Accordingly, the EIR judged this value as one-tenth (0.1) of which a typical open grassland could provide.

Per the FEIR, 302 acres of the Northern Subarea agricultural lands (Figure 2), and 375 acres of the Southern Subarea agricultural lands (not including the portions of the development planned as open space) (Figure 3), will be converted to urban development as a result of the long term buildout of the Specific Plan. It should be noted that since the certification of the FEIR, the Southern Subarea no longer includes the Edison parcel; therefore, the conversion of agricultural lands in the Southern Subarea has since been reduced to 367 acres. Therefore, the total conversion of agricultural lands that function as limited foraging habitat within both subareas is also reduced herein to 669 acres. The acreage of agricultural fields anticipated to be converted to urban development in the Southern Subarea could decrease further if a land conservancy purchases land in this subarea.

Adaptive Management Concept

Adaptive management is a structured, iterative process of optimal decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring. In this way, decision making simultaneously maximizes one or more resource objectives and, either passively or actively, accrues information needed to improve future management (http://en.wikipedia.org/wiki/Adaptive_management). Adaptive management is a suite of assessment and management tools most appropriately applied where uncertainty exists and where decisions are best made on the basis of accumulated information. Adaptive management is the process by which ecological processes are fostered to assist habitat replacement and reconstruction following the "hard engineering" of the remedial action.

In adaptive management, the goal of achieving a desired range of habitat characteristics is met by applying site-specific habitat information in an iterative framework of measurement and response (Holling 1978; Thom 1997). In this framework, no single goal determines success or failure. Rather, if certain goals are not being met, additional analysis is conducted and decisions are made regarding the need for and approach to particular adaptive responses. Flexibility is an important component of adaptive management, so the potential responses cover a broad range of possibilities. These potential responses include additional monitoring, literature research, experiments, consultations with discipline experts, re-evaluation, and restatement of goals and success criteria, and/or active intervention (such as planting desired species or removing invasive species).

Figure 2. Proposed SouthShore Ormond Beach Specific Plan

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Figure 3. Proposed South Ormond Beach Specific Plan

2.0 TARGET RESTORATION INDICATOR SPECIES

Life History of Target Raptor Species

Raptors play important roles in ecosystems, in regulating prey populations, and in nutrient cycling. Because of their top position in the food-chain, raptors serve as barometers of environmental change and overall ecosystem health. The quality of raptor health is a measure of environmental health. They typically require large areas and healthy prey populations for survival. As such, measures that conserve raptors can provide an umbrella of protection for many other plant and animal species. Raptors are also important components of biological diversity. The variation among different species and the genetic variation within individual species of raptors (i.e., the "gene pool") contribute to the biodiversity of a region. Because research into raptors is ongoing, the full range of ecological values will not likely be known for many years. Thus, it is prudent to conserve raptors to retain both their known and presently unknown ecological values.

Raptors observed in the agricultural fields within the Northern Subarea during the 2004 reconnaissance survey conducted by URS for the OBSP FEIR (2009) included red-tailed hawk (*Buteo jamaicensis*) and American kestrel (*Falco sparverius*). White-tailed kites are known to forage in both the Northern and Southern Subareas, and burrowing owls have been observed in the Southern Subarea, which provides generally higher quality habitat than the Northern Subarea. In addition to these raptors known to occur in the Specific Plan area, red-shouldered hawk is also expected in the vicinity and are likely to forage in the restored habitats, including within urban landscaping areas depending on the density of vegetation and distance from structures. Osprey are also included as a target species as this species may be attracted by the development of Southshore Lake. These target raptor species that will be used as indicators of habitat function and restoration success are discussed in more detail below.

White-tailed kite (*Elanus leucurus*) has no federal status, but is fully protected under the California Fish and Game Code. Kites are considered uncommon to locally fairly common residents along the coastal slope of California. In northern California, winter densities range from 1 kite per 15 acres to 1 kite per 28 acres (Birds of North America Online). Population sizes appear to fluctuate in synchrony with fluctuating rodent populations. Nonbreeding populations of this species are limited primarily by food, whereas breeding populations appear limited both by food and nest-site availability. Territory size in this kite is a function of both prey and competitor abundance (Poole 2005). Daily energy budgets during the nonbreeding season equal roughly 3 prey items, or 2.7 ounces killed/day (mass after evisceration) (Koplin et al. 1980). Kites prey almost exclusively on small rodents, specifically California vole, house mouse, and harvest mouse (Waian 1973 and Stendell 1967). Since voles are larger and diurnal, they provide more food per hunting effort. Thus, although voles are considered the favored prey of kites, they will opportunistically prey upon the two other species when vole numbers decline or when alternate prey is more abundant and relatively easy to capture.

Kites are often recognized for their hunting behavior known as "kiting" or hovering. Kites hover with shallow-beating wings, falling with quick dives and strikes upon locating prey. Hovering may occur as high as 80 feet, making the behavior conspicuous to observing humans. Although kite pairs may be found year round, more pairs are observed December through

September. Nest building typically begins in January and may continue through August. Eggs may be laid throughout the spring and into the summer months depending on the number of nests built by a pair. Kites primarily nest in riparian areas with sycamores, oaks, willows, and cottonwoods, and hunt in adjacent open spaces.

Burrowing owl (*Athene cunicularia*) (Species of Special Concern under the California Fish and Game Code - burrow sites and some wintering sites) were once widespread and fairly common over western North America. In recent decades, however, a number of populations appear to have declined, or in some cases, disappeared altogether. The range of the burrowing owl in California extends through the lowlands south and west from north central California to Mexico, with small, scattered populations occurring within the Great Basin and the desert regions of the southwestern part of the state (DeSante et al. 1996). Burrowing owl frequents open, low, dry grasslands, deserts, and scrublands, typically around small mammal colonies (ground squirrels). Owls generally avoid thick, tall vegetation and brush (Rich 1986; Green and Anthony 1989; Plumpton and Lutz 1993a). The distribution of burrowing owls in western North America coincides with that of California ground squirrels and prairie dogs (Coulombe 1971). Ground squirrels provide excavations which the owls can modify into nest burrows. These mammals further alter the environment in the vicinity of holes by grazing vegetation near burrows, thereby increasing horizontal visibility which can increase the probability of nest use by owls (MacCraken et al. 1985; Green and Anthony 1989).

During the breeding season, the owls' activity is tightly centered around the nest burrow. Owls defend the area immediately around the nest burrow (Martin 1973; Zarn 1974; Gervais and Rosenberg, unpubl. data). During the nonbreeding season, burrowing owls remain closely associated with burrows, as they continue to use them as refuges and roost sites throughout the year. Foraging distances from the nest burrow range from 9.5 to 42.4 meters. Reuse of nest burrows occurs in both migratory and resident owl populations. Small mammals tend to dominate as prey items in terms of biomass although insects make up the majority of individual prey items (Thompson and Anderson 1988, Green et al. 1993, Plumpton and Lutz 1993b).

Red-shouldered hawk (*Buteo lineatus*) (no special status) is a common yearlong resident along the California coast in low-elevation riparian woodlands up to 5,000 feet. This species inhabits a variety of topographic areas in California, preferring riparian and oak (*Quercus spp.*) woodlands, but also found in eucalyptus groves and suburban areas with nearby woodlots. Nests are typically found in dense riparian habitats, about half way up a tall tree. Nest height averages 50 feet (range 20 to 80 feet). The nest is located next to the main tree trunk, or on old nests of squirrels, hawks, or crows; lined with strips of bark, dry leaves, and sprigs of evergreens (Call 1978 in Zeiner 1990).

A study of home ranges for red-shoulders in southern California, found the home ranges were between 298 acres for six males and 249 acres for seven females (95% HM method; Bloom 1989, Bloom et al. 1993). Mean spacing between nests was over 2,000 feet (Wiley 1975). The diet of the red-shouldered hawk is highly varied; including small mammals, snakes, lizards, amphibians, small or young birds, large insects, and carrion. Mainly a perch hunter, the red-shouldered hawk perches on trees, snags, and posts, dropping into flight when prey is located. Occasionally hunting takes place when the bird is flying.

Red-tailed hawk (*Buteo jamaicensis*) (no special status) is a common, permanent breeding and winter resident and migrant found in almost all California habitats, from lowest to highest elevations. It is the most common hawk readily observed by the general public. The species breeds throughout California, and winters in all areas without heavy snow cover. Red-tail feed on small mammals up to hares in size, small birds, reptiles, amphibians, and some carrion (Orians and Kuhlman 1956). In winter, the species is largely dependent upon mice, but also takes medium to fairly large birds on the ground. Hunting occurs while soaring and from perches. Red-tail pounce on prey from low, quartering flights, sometimes hovering on wind or air currents.

Red-tailed hawk is highly territorial during the breeding season in all three dimensional. Boundaries often follow well-defined physical features (road, waterway, forest edge; Fitch et al. 1946) and remain remarkably stable year-to-year, and even decades, regardless of turnover of individuals (Janes 1984b 2003; Moorman et al. 1999). Minimum inter-nest distance was reported to be 1,050 feet (Seidensticker and Reynolds 1971). Nesting densities may be related to perch distribution as well as food availability. Highest breeding densities in North America are reported in mixed wooded and open environments in California at 321 acres/pair (Fitch et al. 1946) and in Colorado at 494 acres/pair (McGovern and McNurney 1986).

American kestrel (*Falco sparverius*) (no special status) is a common resident throughout California. American kestrel winters in all habitats except high elevations. Open habitats in a variety of shrub and early successional forest habitats, forest openings, and various ecotones are utilized by this species. American kestrels seek cover in a variety of cavities in trees, snags, rocky areas, banks, and buildings. They nest in cavities in trees, snags, rock crevices, cliffs, banks, and buildings. Bent (1938) reported nests in cavities in sycamores, willows, and cottonwoods. In some areas, good foraging habitat exists, but there is a lack of nesting cavities. The placement of nest boxes has allowed kestrels to use such areas.

American kestrels forage in open and partially open areas of most habitats where cavities are nearby. Much of the time American kestrels search for prey by perching on elevated sites such as telephone poles and wires, trees, fence posts, buildings, and communication towers. Where there is no suitable perch, kestrels will hover. Kestrels forage by facing into the wind and, with alternating bouts of flapping and gliding, stay stationary over the ground while scanning for prey. Large insects and small rodents are the main prey, but amphibians, reptiles, and birds are also taken.

Osprey (*Pandion haliaetus*) (Watch List under the California Fish and Game Code) breed in northern California and are considered an uncommon winter visitor along the coast of southern California (Garrett and Dunn 1981). Suitable osprey habitat only occurs in areas with accessible, live fish. Salt, brackish and fresh water in many habitats are used for foraging. Osprey capture their prey near the surface of the water. As a result, they are most abundant in areas with shallow waters that improve access to fish (Poole et al. 2002). Osprey require open, clear waters for foraging: rivers, lakes, reservoirs, bays, estuaries, and surf zones. Ospreys feed nearly exclusively on live fish, at least 80 fish species have been recorded in their diet. Prey fishes usually weigh about 5.3 to 10.6 ounces and are about 9.8 to 13.8 inches in length. Other foods, though very rarely noted, include; snakes, birds, small mammals, amphibians and carrion (Poole et al. 2002), and the take of small reptiles and invertebrates has also been observed.

Life History of Target Prey Species

A variety of birds, small mammals, reptiles, amphibians, and insects constitute the bulk of the prey base for raptor species (Steenhof 1983, Palmer 1988). Some species will forage on carrion as well as live prey, some are specialists that primarily take fish, while others are generalists (Steenhof 1983). Construction of facilities, transportation infrastructure, power lines, and other accoutrements of urban development contribute to habitat loss and fragmentation and can directly and indirectly affect diversity, abundance, and availability of raptor prey populations. Road developments in particular have been shown to restrict movements of small mammals and birds which may affect their dispersal and population levels (Oxley et al. 1974). Management and mitigation efforts should be focused on maintaining and improving habitats sufficient to support healthy prey populations.

The following summarizes elements of the basic life history for the target prey species important to the survival of white-tailed kite, burrowing owl, and other raptors. This information is summarized from the life histories provided by the California Department of Fish and Game (CDFG) California Wildlife Habitat Relationship System (CWHRS) (Zeiner, 1990) and NatureServe Explorer (2009).

California vole (*Microtus californicus*) feed mainly on leafy parts of grasses, sedges, and herbs, seeking cover in dense grass, beneath plant residues, in brush piles, beneath logs, and in underground burrows. They prefer meadows and grasslands with friable soils, where their foraging and movement behavior often form a network of above ground runways in grass leading from burrows constructed in soft soils. Voles are active year-round and are generally diurnal. Population densities are variable. A California population ranged from about 2 to 7 voles per acre (Smolen and Keller 1987). Their mean home range varies from a radius of 16 feet up to 49 feet or more (Pearson 1960 in Zeiner 1990). Breeding is throughout the year, reaching peaks whenever food and cover are abundant. Gestation is 21 days, litter size averages 4 young (ranging between 1 and 9), and between 2 to 5 litters of up to 8 to 20 young may be produced each year. Weaning occurs at around 21 days. Females reach sexual maturity at 29 days on average. Length for this species ranges between roughly 6 to 8 inches and weight averages between 1 to 2.5 ounces (Jameson and Peeters 2004).

Western harvest mouse (*Reithrodontomys megalotis*) is omnivorous, eating seeds, insects, fruits, and shoots from the ground surface and in bushes. The species prefers thick grass or shrub cover for foraging and nesting, and is typically ubiquitous, but most abundant in grasslands, shrublands, and early seral stages of forest habitats, usually near water. Harvest mice are nocturnal and crepuscular, staying active year-round, and are most active on moonless and rainy nights. Density commonly may be about 5 to 10 per acre, up to 60 per acre in optimum habitat (Gray 1943, Whitford 1976). The species' home range is variable, but was shown to average 1.0 to 1.38 acres in California coastal scrub (Brant 1962, Meserve 1977 in Zeiner 1990). Harvest mice breed year-round, peaking in April, mid-summer, and October (Smith 1936; Fisler 1965, 1971 in Zeiner 1990). Litter size averages 2 to 4 young (ranging between 1 and 9) with up to 14 litters per year. Females become sexually mature at 4 months with multiple breeding cycles during the year. Length (including a long tail) for this species ranges between roughly 4.5 to 6 inches, and weight between 0.3 and 0.5 ounces (Jameson and Peeters 2004).

House mouse (*Mus musculus*) usually forage beneath or near cover, on a wide variety of foods, including grains, fruits, seeds, vegetables, fleshy roots, meat, arthropods, glue, paste, soap, and other household articles. This species may eat about 10% of its body weight daily, feeding 15-20 times a day. House mice rarely occur far from cover (buildings, rubbish piles, slash, vegetation) and are found near human habitation and surrounding riparian habitats. Optimal habitat includes refuse piles, debris or vegetation for cover, and accessible free water. House mice are predominately nocturnal and active year-round. They live in colonies and densities vary greatly. Peak densities reach 300 or more individuals per acre (Lidicker 1966). Their home range is known to vary throughout California from 0.03 acre to 0.28 acre (DeLong 1967 in Zeiner 1990). House mice breed year-round, with peaks in early spring and late summer. Litter size averages 4 to 5 young (ranging between 3 and 12); with 5 to 8 litters per year. Weaning occurs at 3 weeks and females reach sexual maturity at 8 weeks. The average length for the species is between roughly 6 to 8 inches. The average weight is between 0.4 and 0.8 ounces (Jameson and Peeters 2004).

Big-eared woodrat (*Neotoma macrotis*) is common in California, and is found in both the Coast Ranges and interior. Woodrats live in a variety of habitats, both arboreal and terrestrial (English 1923). Habitats include chaparral, hardwood, conifer, and mixed forests, and riparian woodlands (NatureServe 2008). In most instances, nests are constructed in inaccessible areas, such as thorny thickets, poison oak patches, or nettles (English 1923). Abundance is probably limited by availability of nest-building materials, and nests are defended against competitors. *N. macrotis* are mostly nocturnal and are active year-round. *N. macrotis* is a solitary species (Linsdale and Tevis 1951), but lives in stable social groups (Hamm et all 2002, Wallen 1982). Colonies are made up of 3 to15 houses (English 1923). The majority of woodrats present in a colony are permanent residents (Wallen 1982). While *N. macrotis* does have a home range, it also exhibits territorial behavior in its core area and will actively defend its nest against conspecifics (Sakair and Noon 1997). The density of houses in an area also varies in the literature and ranges from 5 individuals per acre (Cranford 1977) to 18 individuals per acre (Matocq 2004). Woodrats are herbivores and eat grasses, leaves, fresh fruits, small bulbs, bark, and flowers. Woodrats also store dry foods like hazel nuts and acorns (English 1923). Since *N. macrotis* is a medium-sized rodent, it is a popular prey item for a number of predatory species.

The houses of *N. macrotis* provide shelter to a range of other species. The presence of these commensals suggests that woodrats increase biodiversity. *N. macrotis* live for 2 to 3 years. The species is nocturnal and spends the majority, but not necessarily all, of the daylight hours resting within its house (English 1923). Woodrats are most active 2 to 3 hours after dark (Wallen 1982). Average length of an individual is 4.7 inches and average mass is 9.4 ounces (NatureServe 2008).

Botta's pocket gopher (*Thomomys bottae*) is found in a wide variety of habitats from valleys to high mountain meadows. It inhabits a wide variety of soils from soft sands to friable loams to hard clays. *T. bottae* is primarily solitary. This species is fossorial but commonly active above ground. Young are born in underground burrows. Among 6 populations in California, the average adult density per acre ranged from 24 in valley grassland to 30 in alfalfa monocultures (Patton and Smith 1990). Botta's pocket gopher is active throughout the year and active intermittently day and night. Pocket gophers are ecologically important as prey items and in influencing soils, microtopography, habitat heterogeneity, diversity of plant species, and primary productivity (Huntly and Inouye 1988). They eat roots, bulbs, tubers, and other

vegetable matter. In southern coastal California, forb shoots appeared to be preferred, particularly during reproduction; grass shoots, corms, and roots increased in importance during plant dormancy (Hunt 1992). *T. bottae* may feed underground, pulling plants into burrows by roots, and forages above ground at night or on overcast days. Their average length is 11 inches and average weight is 8.8 ounces.

California ground squirrel (*Spermophilus beecheyi*) occurs in south-central Washington south through California and extreme west-central Nevada to Baja California, Mexico. This species is found in a wide variety of habitats, usually in open areas in many plant communities. It sleeps and rears young in underground burrows. *Spermophilus beecheyi* digs deep burrow usually under protective object (log, rock, building, bush) if available, or in the open. California ground squirrel is omnivorous. During spring and summer, it feeds primarily on green vegetation: leaves, flowers, bulbs, roots, etc. In late summer and fall, this species may eat more seeds, berries, and nuts. *S. beecheyi* also eats insects and occasional small vertebrates, including young conspecifics (done mainly by breeding adult females). The approximate adult density per acre is 5 squirrels. In west-central California, mean home range size was 985 to 1,310 square feet in males, 1,970 to 2,950 square feet in females with overlapping home ranges (Boellstorff and Owings 1995). This species may hibernate in some areas; winter inactivity is more pronounced at higher latitudes and elevations (Dobson and Davis 1986). California ground squirrel is active throughout the day during warmer months and in good weather. The average length is 19 inches, and the average weight is 26 ounces.

Target Shorebird Species

The Southern Subarea has greater bird use and diversity of bird species than the Northern Subarea due to its larger area and proximity and connectivity to Ormond Beach. The sod farm operation functions somewhat similarly to a grassland habitat interspersed with freshwater wet areas. Birds observed along the Oxnard Drain channel at the southern end of the Southern Subarea and the wetland habitats on the south side of the drainage include mallard, American coot (*Fulica americana*), snowy egret (*Egretta thula*), great egret (*Ardea alba*), white-faced ibis (*Plegadis chihi*), greater yellowlegs (*Tringa melanoleuca*), black-necked stilt (*Himantopus mexicanus*), dunlin (*Calidris alpina*), and least/western sandpiper (*Calidris minutilla/mauri*). Most shorebirds are foraging on surface and subsurface invertebrates, while egrets, herons, and raptors feed on small birds and rodents found mostly on the edges of the Southern Subarea.

A number of rare or uncommon species occur nearly annually, including Pacific golden plover (*Pluvialis fulva*), American golden plover (*Pluvialis dominica*), buff-breasted sandpiper (*Tryngites subruficollis*), red-throated pipit (*Anthus cervinus*), McCown's longspur (*Calcarius mccownii*), Lapland longspur (*Calcarius lapponicus*), and chestnut-collared longspur (*Calcarius ornatus*). In addition, the fields are used regularly by migrating and wintering species such as black-bellied plover (*Pluvialis squatarola*), horned lark (*Eremophila alpestris*), and savannah sparrow (*Passerculus sandwichensis*). Belding's savannah sparrow, a state-listed endangered bird, has been sighted on or immediately adjacent to the Southern Subarea (Pereksta, 2005; USFWS, 2005; BioSystems Analysis, 1993 in URS 2009); however, it is noted that this species is a resident upper saltmarsh species, preferentially nesting in pickleweed.

3.0 RAPTOR COMPATIBILITY WITH HUMAN LANDSCAPES

Evidence suggests that some falcons, ospreys, Cooper's hawk, and owls are generally more tolerant of human-induced disturbance and human environments. Golden eagle, northern harrier, northern goshawk, and sharp-shinned hawk appear much less tolerant of disturbances. Buteos (ferruginous hawk, red-tailed hawk, Swainson's hawk) exhibit a wide range of acceptance levels (Thomsen 1971, Martin 1973, Herron et al. 1985, Hayward 1994, Bloom and McCrary 1996); however, some have speculated that the ferruginous hawk should be considered the most sensitive raptor to human disturbance (Woffinden and Murphy 1977, Olendorff 1993). Additional disturbances within already altered environments may be less disruptive than disturbances associated with isolated breeding pairs of raptors in unaltered habitats (Romin and Muck 1999).

The goal of this plan is to create functional raptor foraging habitat; however, designing such habitat within the confines of a large human landscaped development creates constraints to the success of the mitigation effort. It should be noted though that many raptors readily forage in unsuspecting places such as road medians and freeway onramps. Although portions of this plan proposes to create raptor foraging habitat along roads and between structures, the overall success should be determined by actual usage by raptors, not just by the habitat created.

Raptor tolerance levels to disturbance are generally species-specific, but it is important to note that tolerance levels also vary amongst individuals of a particular species. For example, within an urban nature preserve, Cooper's hawk has been documented nesting 35 feet from a 4-lane road, and 75 feet from a parking lot, and was completely comfortable with the level of human disturbance. Meanwhile, another Cooper's hawk located a few hundred feet deeper into open space in the same nature preserve (away from human landscapes) was extremely agitated by human presence and actively protecting its nest from passer-bys.

For the purpose of this report, the following discussion presents raptor compatibility with human landscapes on a species-specific level.

Burrowing owl can nest close to human developments, but nesting burrows are susceptible to predation (cat and dog) and disturbance. Activity budgets do not differ significantly between rural and urban land uses, and there is high variation between owls and between sites within land-use types. Activity budgets of burrowing owl appear to be highly variable and affected by weather, time of day, habitat, available prey, and other factors. Hunting success does not vary with land use, although the type of prey taken does differ between urban and rural sites. Land-use conditions at a Texas panhandle study site did not have an effect on adult male burrowing owl activity budgets. Botelho and Arrowood (1996) found that although mortality factors were higher in urban than natural sites in New Mexico, nesting success was also higher. Similarly, although nest density and nesting success were higher at agricultural than urban sites in Washington, natal recruitment and adult annual return rate were higher at the urban locations (Conway et al. 2006). Furthermore, Conway et al. (2006) found that mean clutch size and number of fledglings per successful nest did not differ with land use, suggesting that site-specific traits may be more influential than land-use context. Any determination of effects of human activities on owls will have to account for these effects, and thus, will likely require large sample sizes. Given that land use varies with local socioeconomic, climatic, and topographic factors, effects on burrowing owl will likely vary by region (Chipman et al. 2008).

White-tailed kite require an approximate 75-foot buffer from human landscapes and structures for foraging, with greater distances typical for nesting, but dependent on the overall context of the nest site. For example, a 200-foot wide low grassland vegetated area between structures would include the 75-foot buffer on each side, with the remaining 50 feet in the middle providing actual foraging habitat. However; the entire 200 feet provides habitat for raptor prey as long as enough connectivity is available for recruitment of prey species.[1]

Red-tailed hawk is compatible with several different urban environments that support populations of suitably sized prey, including various reptiles, snakes, voles, ground squirrels, and woodrats. Red-tailed hawk can coexist with humans in the rural environment if they have open grassy or shrubby areas to hunt in, large trees to nest in, and are not subject to disturbance at the nest. Red-tailed hawk is beneficial to landowners as they reduce small mammal populations. A nesting red-tailed hawk is very wary during nest construction, and will often abandon the nest during this period if disturbed, though this can vary substantially with the individual (one has nested for at least 17 years on a building adjacent to New York's Central Park [http://en.wikipedia.org/wiki/Pale_Male]). At the local level, red-tailed hawk populations are limited by both nest sites and food supply. The relative importance of each factor may be variable throughout the year. For example, competition with great horned owl for nest sites and food may depress red-tailed hawk populations. Leading causes of death of this species include collisions with automobiles and starvation. Mortality from shooting and trapping also occurs (Demarchi and Bentley 2005).

Red-shouldered hawk exhibit a broad range of adaptability to human altered environments in California. The western subspecies of the red-shouldered hawk appears to be the most adaptable of the 10 North American breeding buteos, with some pairs using urban habitats almost exclusively (Bloom et al. 1993). Red-shouldered hawks are a regular component of the urban nesting avifauna in coastal southern California where land managers have preserved adequate open space and habitat. Red-shouldered hawk is compatible with several different urban environments that support populations of rodents such as voles, gophers, and field mice. Red-shouldered hawk can coexist with humans in the rural environment if they have grassy or shrubby areas to hunt in, fairly large trees to nest in, and are not subject to disturbance at the nest. At the local level, red-shouldered hawk populations are limited by both nest sites and food supply. The relative importance of each factor may be variable throughout the year. Leading causes of death of this species include collisions with automobiles, shooting, trapping, and starvation (Demarchi and Bentley 2005).

American kestrel eat many small prey animals that occur in urban and rural areas. Large insects such as dragonflies and grasshoppers, and small rodents such as voles and mice, make up much of their diet. Like most raptors, kestrels will take advantage of any food source. Other prey species in their diet include, but are not limited to, many types of small birds, reptiles, and amphibians. Human-related mortality is the most commonly reported cause of death for this species, but not necessarily the leading cause of death. Collisions with wires, vehicles and windows, electrocution, drowning in tanks and pools, and attacks by domestic pets are commonly reported. Removal of young and eggs by snakes, crows, and mammals occur; other raptors are known to kill adults. While known to have been affected by pesticide

[1] *These findings are based on internal confidential studies conducted by Rincon Consultants.*

contamination, American kestrel may be affected more by reduced numbers of insect prey following pesticide applications (Demarchi and Bentley 2005).

Osprey readily build nests on human-made structures, often in close association with human activity. Their frequent use of power poles at some locations for nest sites has spurred the placement of alternate poles with nesting platforms attached so as to avoid electrocutions and interference with power supplies. Local declines of fish resources may also impact local populations of osprey. Several human-induced factors benefit osprey, including the creation of reservoirs increasing habitat, intensive fisheries management programs that stock lakes with trout or bolster natural productivity, erection of artificial nest platforms in suitable areas, improved water quality and clarity in fish-bearing lakes, nest guards to deter predators, and maintaining large trees (Demarchi and Bentley 2005).

4.0 DEFINING SUITABLE RAPTOR FORAGING HABITAT

Suitable raptor foraging habitat is relative to the natural habitat requirements of a particular raptor species and the amount of human pressure that species can withstand. The definition of suitable raptor foraging habitat is presented here as a baseline for comparing the current conditions and raptor habitat available onsite (agricultural fields) against predicted post-project conditions (restoration sites within and amongst highly developed areas with significant human influences). Understanding raptor habitat requirements along with raptor tolerance of humans will dictate the delineation of appropriate restoration areas within proposed open space for the restoration effort, and will guide in value-ranking areas that may be worth partial credit towards the restoration effort.

For the purpose of this adaptive management plan, suitable raptor foraging habitat is generally defined here as habitat consisting of the following:

- Predominantly low-growing native and naturalized grassland;
- Braided shelterbelts of native coastal sage scrub for perching and prey habitat;
- Small clusters of large wind-firm trees for perching and nesting;
- Small mammal colonies;
- Habitat connectivity to other open space areas for prey recruitment; and
- Open space land at least 75 feet wide that is vegetated with native plants, provides suitable habitat for prey species and is connected to adjacent suitable foraging areas.

For the purpose of this report, suitable foraging habitat, as defined above, is assigned a value of 1.0 based on typical prey species abundance and ability of raptors to successfully hunt for food. Certain locations that contain a high density of small mammals or other prey with insufficient cover can at times greatly exceed this value, but the focus of this plan is on suitable foraging habitat that is typical of the open spaces in coastal southern California. The current foraging condition onsite (agricultural fields) has been assigned a value of 0.1 (per the FEIR Mitigation Measure BIO-2). Restored foraging habitat as discussed below is intended to reach the 1.0 value by the third year. With these foraging habitat characteristics and foraging habitat values in mind, Rincon delineated those areas within the OBSP subareas that may be suitable as raptor foraging restoration sites.

The Northern Subarea open space land provides for restoration areas that undulate from 50 to 150 feet wide around Lake SouthShore, and so portions of habitat would not strictly meet the criteria above. However, these 50-foot wide areas nonetheless maintain connectivity between the larger areas and the lake itself provides buffer from the more intense urban development; therefore these areas are included as suitable foraging/prey habitat. The open space areas within the Southern Subarea provides for restoration areas that vary from 70 to 150 feet wide. Although areas with widths as low as 70 feet may not actually provide foraging habitat for low urban tolerant raptor species, these areas do provide habitat for other avian species and raptor prey species as long as sufficient connectivity is provided for recruitment of prey species.

Although several proposed areas within the Northern Subarea are proposed as open space, Rincon has determined that open space areas proposed as community sod parks, windrow tree breaks adjacent to roads and structures, and areas lacking sufficient buffer from human landscapes are not appropriate to restore raptor foraging habitat. A value of 0.001 to 0.01 could be credited towards such areas, but such is insignificant towards the overall restoration goals of creating grasslands with native scrub adjacent to open space areas for small mammal recruitment, and suitable buffers from human landscapes.

5.0 HABITAT RESTORATION DESIGN

The goal of this habitat restoration project is to restore raptor foraging habitat to mitigate for impacts to foraging habitat associated with the proposed project. This section discusses the existing design plans for the northern and southern subareas, conceptual restoration options for both subareas, the wildlife habitat functions that are anticipated to be created by the general restoration effort, the expected viability and sustainability of the restored habitat, and the time lapse between the proposed impacts and expected success of the restoration effort.

In highly modified landscapes, such as urban areas, restoration, enhancement, and maintenance measures are often required to maintain viable populations of raptors. Habitat restoration includes re-establishing habitat features and ecological conditions that have been modified by human activities. The goal of restoration and enhancement should be to re-establish natural habitat features providing excellent foraging habitat for raptors, such as restoring habitats where natural vegetation has been removed or altered. Achievement of this goal will be facilitated by planting native grassland habitat with emergent trees using native species of grasses, herbs, and trees; creating scrub thickets and natural hedgerows using native shrub species; and controlling introduced invasive plants.

Mitigation Requirements

The OBSP, as currently designed, will result in the conversion of up to 669 acres of agricultural lands that provide limited habitat function and foraging resources for raptors, shorebirds, migratory waterfowl, and other native birds. The existing foraging habitat acreage consists of 302 acres in the Northern Subarea and 367 acres in the Southern Subarea.

Based on mitigation typically required by CDFG, the City in its OBSP FEIR determined that a mitigation ratio of 0.1 : 1.0 is warranted (0.1 acre shall be restored for every 1.0 acre converted to urban development). This ratio recognizes the degraded value of the foraging habitat, and thus,

the ration is lower than would be appropriate from a habitat standpoint for undisturbed natural foraging areas. The application of the 0.1:1.0 ratio results in a mitigation requirement of 30.2 acres (10 percent of 302 acres) for planned urban development in the Northern Subarea. Currently planned development in the Southern Subarea would result in the conversion of up to 367 acres of habitat; therefore, the total mitigation requirement for this subarea is 36.7 acres of foraging habitat. Please note that at the time of this report preparation portions of the Southern Subarea are under consideration for conversion to natural habitat, and the mitigation ratio would not be applicable to those lands. At this time, a total of 66.9 acres of raptor foraging habitat is required to compensate for habitat loss that would occur from urban development within the two subareas.

As part of the total foraging habitat mitigation requirement, the City is also requiring the restoration of 6.8 acres of open mud flat and/or low herbaceous wetland habitat specifically for shorebirds to mitigate for loss of agricultural drainages. This adaptive management plan proposes to restore 6.8 acres of low herbaceous wet habitat for shorebirds as mitigation for the loss of the agricultural drainages. While the main use of this wet herbaceous habitat is intended for shorebirds, other organisms associated with this habitat will also serve as prey for several raptor species (such as California voles). All 6.8 acres of required wet herbaceous habitat restoration will be implemented within the Southern Subarea. As such, the 6.8 acres of wet herbaceous habitat restoration was subtracted from the Southern Subarea's total restoration requirement to determine the balance that will need to be implemented as upland foraging habitat restoration.

The subarea development plans for the OBSP were reviewed to determine the amount of restoration that could potentially be implemented within the open space portions of the two subareas, and then the balance of offsite mitigation (if any) was determined. Table 1 provides a summary of the restoration requirements, the area potentially available within the subareas for restoration of suitable habitat for foraging raptors and other birds, and the amount that would be required offsite if the proposed restoration is implemented.

Table 1. Summary of Mitigation Requirements and Proposed Onsite/Offsite Mitigation (acres)

Subarea	A Total Avian Foraging Habitat Mitigation Required [1]	B Required Wet Herbaceous Habitat Mitigation	C Required Upland Mitigation (A – B = C)	D Area Available Onsite for Wet Habitat Mitigation (Figure 5)	E Area Available Onsite for Upland Mitigation (Figures 4 & 5)	F Offsite Area Needed to Fulfill Upland Mitigation Requirement (C - E = F)
Northern	30.2	0.0	30.2	0.0	10.2	20.0
Southern	36.7	6.8	29.9	6.8	30.4	0.0
Totals	**66.9**	**6.8**	**60.1**	**6.8**	**40.6**	**20.0**

[1] *Based on current design. Use of portions of Southern Subarea for other native habitat restoration would reduce foraging habitat mitigation requirement.*

Mitigation Measure BIO-2 of the certified OBSP FEIR states that suitable mitigation includes the restoration or enhancement of coastal native grassland and open shrubland foraging habitat for raptors and other birds. The habitat restoration is to focus on improving foraging habitat for sensitive avian species. BIO-2 encourages that the mitigation should be in the vicinity of the project site and near coastal wetlands, and that the mitigation should result in habitat with higher functional quality. With these criteria considered, onsite mitigation is preferred; however, this section provides two options to fulfill the mitigation requirement.

It is noted that proposed development within areas identified as jurisdictional waters and/or wetlands may be subject to the permit requirements of the U.S Army Corps of Engineers (Corps) pursuant to Section 404 of the Clean Water Act (CWA), Regional Water Quality Control Board (RWQCB) pursuant to Section 401 of the Clean Water Act and Porter-Cologne Water Quality Act, and a CDFG Streambed Alteration Agreement pursuant to Section 1600 et. seq. of the California Fish and Game Code. To date, no delineation has been conducted of either subarea agricultural drainages to determine the location and extent of waters and wetlands within the subareas that are potentially subject to these jurisdictions. Such jurisdictional areas are determined by the state and federal authorities at the time that permits are requested.

This plan includes the restoration of 6.8 acres of low herbaceous "wetland" habitat that is intended for avian foraging habitat, and is not specifically intended to mitigate for possible impacts to wetlands subject to the jurisdiction of these regulatory agencies. During the permitting process and prior to construction, the subarea applicants shall consult with applicable regulatory agencies to determine if restored areas under this adaptive management plan can also be credited towards mitigation for impacts to potential jurisdictional waters (including wetlands). If permit conditions require different or additional onsite mitigation requirements that alter the design concepts or acreages of this adaptive management plan, this plan may be amended based on final permit conditions.

Mitigation Option 1: All or Partial Onsite Restoration

Northern Subarea. Under Mitigation Option 1, a portion of the Northern Subarea proposed open space areas will be used to fulfill a portion of the Northern Subarea requirement for raptor foraging habitat restoration (Figure 4). The following three measures would meet the ***30.2-acre*** upland restoration requirement:

1. All upland open space land immediately west, south, and east of the shoreline of Lake SouthShore will be planted with native transitional species near the shoreline, transitioning to upland grassland species with patches/hedgerows of native shrubs and trees. This will be implemented in three specific sections of open space areas adjacent to Lake SouthShore:
   - 1.8 acres surrounding the southern and western corner of the western lake section.
   - 4.1 acres between the southern margin of the middle lake section and Hueneme Road.
   - 2.4 acres surrounding the southern and eastern corner of the eastern lake section.

   These areas provide a total of approximately *8.3 **acres*** of upland raptor foraging habitat restoration area.

2. In addition to the three locations mentioned above, the detention basin proposed north of the middle lake section island will also be used as a restoration area for upland raptor foraging habitat. Per the applicant, this area has been designed to receive overflow from the lake only when storm events reach a 10-year magnitude recurrence interval or greater. Lake overflow is designed to spill into the basin, which would then drain back into the lake as the lake level recedes. The basin, as proposed, will not require any dredging or vegetation clearing because the drainage system routed to it is not expected to transport significant amounts of sediment. Lake overflow into the basin is designed to reside only for a short time. The total area of this detention basin therefore available for upland raptor foraging habitat is approximately ***1.9 acres***.

3. The remaining ***20 acres*** required to meet the mitigation requirement of 30.2 acres of upland raptor foraging habitat for the Northern Subarea will need to be implemented at an offsite location (offsite mitigation is discussed in detail in Mitigation Option 2 below).

Southern Subarea. Under Mitigation Option 1, most of the Southern Subarea proposed open space will be used for raptor/bird foraging habitat restoration (Figure 5). The following two measures will meet the requirement for the restoration of ***36.7 acres*** of avian foraging habitat:

1. At least ***6.8 acres of wet herbaceous*** foraging habitat restoration will be implemented in the detention basin area where bioswales terminate at the south end of Rose Avenue, Ormond Boulevard, and Arnold Road along the south side of Frontage Road.

2. The remaining ***29.9 acres of upland*** foraging habitat restoration will be implemented within the proposed South Ormond Beach Specific Plan open space areas within planned landscape areas of approximately 70 to 150 feet wide. The following describes the locations of the 29.9 acres of upland restoration areas proposed within this subarea:
   - All open space area along the south side of Hueneme Road between Rose Avenue and Arnold Road
   - All open space along the entire west side of Rose Avenue between Hueneme Road to the north and the Frontage road to the south
   - The southern widest extent between the lanes of Ormond Boulevard between McWane Boulevard and Frontage Road
   - All open space west of Arnold Road between Hueneme Road to the north and the Frontage road to the south
   - All open space along the south side of the Frontage Road, excluding the proposed wet herbaceous habitat restoration area

Under this option, no offsite mitigation would be necessary for the Southern Subarea to fulfill their portion of the City's mitigation requirement based on current urban development plans. As previously noted, the mitigation requirement may be reduced if a portion of this area is instead restored to other native habitat. However, if the Southern Subarea as-built conditions ultimately do not provide adequate open space acreage needed to fulfill the upland restoration requirement, any residual upland restoration remaining shall be implemented at a suitable offsite location, as discussed in Mitigation Option 2 (below).

Figure 4. Lake SouthShore Open Space Foraging Habitat Restoration Areas

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Figure 5. South Ormond Beach Open Space Foraging Habitat Restoration Areas

Mitigation Option 2: All Offsite Restoration

Under Mitigation Option 2, all 30.2 acres of raptor foraging habitat restoration required for impacts associated with the SouthShore Specific Plan, and all 36.7 acres of restoration required for impacts associated with the South Ormond Beach Specific Plan, would be implemented at an offsite location, such as within a portion of the approximate 230-acre southernmost area of the Southern Subarea that is not proposed for annexation. This offsite mitigation option is proposed to ensure that the total mitigation requirement is fulfilled. In addition, if the onsite portion of this mitigation requirement cannot be fulfilled, or if it is determined that no onsite raptor foraging habitat mitigation is feasible due to constraints from development or proximity to human landscapes and influences, this option outlines measures necessary to implement sufficient and successful compensatory offsite mitigation.

The most viable current option for providing compensatory mitigation offsite is through the private purchase of mitigation lands. This process typically entails the following tasks:

1. Identification of parcels that contain at minimum suitable raptor habitat characteristics.
2. Purchase of an adequate acreage to compensate for project-specific impacts.
3. Preparation of a long-term Habitat Management Plan to maintain and enhance the conservation values of the conserved land in perpetuity.
4. Recordation of a conservation easement or similar instrument that provides legal preservation of the conserved land in perpetuity.
5. Identification of a funding assurance mechanism, such as a letter of credit and/or endowment, for the purchase and long-term management of the conserved land in perpetuity.
6. Coordination with the regulatory agencies, including CDFG and the USFWS, to obtain approval of the proposed compensatory mitigation approach, including the mitigation lands, Habitat Management Plan, conservation easement, and funding assurances.

Habitat Functions Expected to be Restored

In order to restore raptor/bird foraging habitat function as required, all on- and off-site mitigation will be implemented in accordance with this adaptive management plan and installation program. The restoration areas would be maintained and monitored for a minimum of three years and would be subject to success criteria and triggers for adaptive responses detailed herein.

The habitat functions expected to be restored within the restoration sites include those characteristics discussed above in Section 4, Defining Suitable Raptor Foraging Habitat. Specifically, the habitat functions that are expected to be replaced onsite/offsite include attributes and/or key components that are essential to maintaining the long-term use and integrity of the mitigation area by the target raptor species, and they include the following:

- Maintain habitat viability in terms of normal growth/development of functional habitat.
- Increase resources without resource depletion so that the habitat can continue to thrive into the future without external infusions of resource.

- Increase native cover and species richness with the creation of low-growing native and naturalized grassland habitat with native shrub shelterbelts.
- Increase perching and nesting opportunities with the establishment of small clusters of large trees.
- Maintain some habitat connectivity to other open space areas for prey recruitment.
- Increase small mammal populations in particular as prey for the target raptors. It is noted that natural vegetation will also provide for increases in the abundance of other prey animals (reptiles, invertebrates, birds), but the focus of the mitigation effort is on small mammals.

Due to the proximity of the available open space areas to human landscapes onsite (within both the Northern and Southern Subareas), the required 75-foot buffer protecting foraging habitat limits the amount of space suitable for the mitigation effort. Appropriate open space upland areas at least 100 feet wide were included in the available restoration area. Most upland areas included are not much wider than 100 feet. A 100-foot area would include the 75-foot buffer; therefore the remaining 25 feet provides for the actual foraging habitat. However; it should be noted that if a 100-foot wide area requires the 75-foot buffer on either side due to development on either side of the 100-foot restoration site (leaving a 50-foot overlap), no space is left for actual foraging activities. Ultimately, the 100-foot wide area (technically all buffer) still provides habitat for raptor prey as long as enough connectivity is available for recruitment of prey species. Prey species from these areas will likely move into other wider adjacent and connected restoration sites that would be used as foraging habitat for the target raptor species.

Time Lapse Between Impacts and Expected Restoration Success

The restoration project shall be initiated prior to the completion of the proposed development to ensure there is no significant temporal loss of foraging habitat for raptors and shorebirds. Each individual restoration effort must be monitored and maintained for a minimum of a three-year period and until success criteria are met. The OBSP development is anticipated to require approximately two years with construction anticipated to begin in 2014. If it is assumed that mitigation would be implemented in the fall of 2016, it should be monitored for a minimum of three years (fall of 2017, 2018, and 2019) to ensure success of habitat establishment and usage by raptors. Assuming this schedule, the time lapse between impacts and expected restoration success would be a minimum of approximately five years (2014 to 2019).

6.0 HABITAT RESTORATION IMPLEMENTATION PLAN

The implementation of this habitat restoration plan focuses on offsetting impacts to raptor/avian foraging habitat resulting from the proposed development and meeting the required criteria and thresholds for a successful restoration effort. This habitat restoration plan is subject to review and approval by the City of Oxnard prior to implementation.

Please note that the term "hydrophytic plant species" is used herein to (1) describe plant species that are recommended to be planted to create the wet herbaceous foraging habitat, (2) is intended only to imply that such plants require more water than upland species, and (3) is not intended to imply that the habitats being restored are Corps or CDFG jurisdictional wetlands.

Implementation Schedule

Per Mitigation Measure BIO-2 of the certified OBSP FEIR, the restoration project should be initiated prior to the completion of the development. Site preparation and irrigation system installation will be conducted prior to planting implementation. All restoration planting installation should be conducted during the first wetting rains from October 1 to February 1. The timing of winter/spring installation will allow for taking advantage of the rainy season, dormancy of foliage, and rooting period to maximize the potential for successful establishment of new plantings. All planting installation will occur when the top six inches of soil are moist following a series of winter/spring storms, or as supplemented by temporary irrigation. As-built conditions will be reported immediately following the completion of installation.

Site Preparation

Any non-native invasive plant species within the restoration site will be removed prior to planting of native vegetation. Use of herbicides will likely not be needed if the restoration areas are maintained frequently to prevent colonization of undesirable species. Immediately following irrigation installation, the restoration areas will be planted with native species by direct planting methods and broadcast seeding methods. A project restoration biologist should be contracted to identify specific planting locations of native vegetation for optimal establishment and longevity based on anticipated hydrology, edaphic factors, exposure, and slope aspect. A vegetative cover consisting of appropriate native plant species will develop slowly from the planted material over a minimum of three growing seasons with proper management.

Planting Plan

Planting plans to be developed by the subarea applicants shall include an assemblage of native plant species, such as those recommended in Table 2, that are known to occur within raptor foraging grassland, scrub, transitional, and wet herbaceous habitats. Establishment of the recommended plant species would significantly increase the raptor habitat functions by providing foraging, nesting, and refuge areas for raptor prey species. Several species are recommended to accommodate the possibility of some species not being available. The landscape plant palettes currently proposed in each subarea's Specific Plan were reviewed and referenced for the development of the plant palette in Table 2; however, several additional native species are recommended herein. In general, the planting plan includes container plantings in addition to broadcast seeding of native species. Approximately 90% of the total restoration required for both the Northern and Southern Subareas combined will concentrate on the development of native grassland habitat, and will include clusters and hedgerows of native scrub stands and emergent isolated native trees. Low herbaceous wet and transitional habitats will also be created for shorebirds and raptors. Container plantings to be installed in the restoration area are to be spaced irregularly and in clusters to emulate natural conditions. A restoration biologist should provide advice for the implementation of the plantings and to aid the subareas in achieving the goals of FEIR Mitigation Measure BIO-2.

Table 2. Recommended Planting Palette

Scientific Name	Common Name	Habit	Planting Material
Planting Zone A – Hrophytic Herbaceous Species			
Cyperus eragrostis	Umbrella-sedge	Perennial herb	Container
Eleocharis macrostachya	Common spike-rush	Perennial herb	Container/seed (3 lb/ac)
Heliotropium curassavicum	Alkali heliotrope	Perennial herb	Container
Juncus bufonius	Toad rush	Perennial herb	Container/seed (3 lb/ac)
Juncus mexicanus	Mexican rush	Perennial herb	Container/seed (3 lb/ac)
Juncus patens	Spreading rush	Perennial herb	Container/seed (3 lb/ac)
Rorippa nasturium-aquaticum	Water cress	Perennial herb	Container/seed (5 lb/ac)
Salicornia virginica	Pickleweed	Perennial herb	Container
Salix exigua	Narrow-leaved willow	Shrub	Container
Schoenoplectus [Scirpus] californicus	California bulrush	Perennial herb	Container
Typha domingensis	Southern cattail	Perennial herb	Container
Planting Zone B - Transitional Species			
Agrostis exarata	Western bentgrass	Perennial grass	Seed (4 lb/ac)
Ambrosia psilostachya	Western ragweed	Perennial herb	Seed (4 lb/ac)
Artemisia douglasiana	Mugwort	Perennial herb	Container
Distichlis spicata	Saltgrass	Perennial grass	Container/seed (8 lb/ac)
Leymus triticoides	Alkali rye grass	Perennial grass	Container/seed (5 lb/ac)
Mimulus cardinalis	Scarlet monkeyflower	Perennial herb	Seed (5 lb/ac)
Muhlenbergia rigens	Deer grass	Perennial grass	Container/seed (6 lb/ac)
Platanus racemosa	California sycamore	Tree (isolated)	Container
Planting Zone C - Upland Grassland Species			
Asclepias fascicularis	Narrow-leaved milkweed	Perennial herb	Container/seed (3 lb/ac)
Bromus carinatus var. *carinatus*	California brome	Annual grass	Seed (5 lb/ac)
Elymus glaucus ssp. *Glaucus*	Blue wild rye	Perennial grass	Seed (5 lb/ac)
Eschscholzia californica	California poppy	Annual herb	Seed (3 lb/ac)
Lupinus bicolor	Miniature lupine	Annual herb	Seed (3 lb/ac)
Melica imperfect	Coast range melic	Perennial grass	Seed (5 lb/ac)
Nassella pulchra	Purple needlegrass	Perennial grass	Seed (8 lb/ac)
Quercus agrifolia	Coast live oak	Tree (isolated)	Container
Planting Zone D - Upland Scrub Species (comprising <10% of upland habitat)			
*Artemisia californica**	California sagebrush	Shrub	Container
*Baccharis pilularis**	Coyote brush	Shrub	Container
Encelia californica	California bush sunflower	Shrub	Container
Eriogonum cinereum	Ashy-leaf buckwheat	Shrub	Container
Eriogonum fasciculatum	California buckwheat	Shrub	Container
*Heteromeles arbutifolia**	Toyon	Shrub	Container
Leymus condensatus	Giant wild-rye	Perennial grass	Container
Lotus scoparius	Deerweed	Shrub	Container
Mimulus aurantiacus	Bush monkeyflower	Shrub	Container
Rhamnus californica	Coffeberry	Shrub	Container
*Rhus integrifolia**	Lemonade berry	Shrub	Container
Salvia leucophylla	Purple sage	Shrub	Container
Salvia mellifera	Black sage	Shrub	Container
*Solanum xantii**	Purple nightshade	Shrub	Container

Northern Subarea. The restoration proposed within the Northern Subarea includes upland mitigation areas (1) south of Lake SouthShore and north of Hueneme Road, and (2) within the proposed detention basin (Figure 4). Mitigation areas along the *lake shoreline* will be planted with transitional plant species (Planting Zone B [Table 2, Figure 6]), including western ragweed, scarlet monkeyflower, mugwort, saltgrass, alkali rye grass, and deer grass. Grassland species (Planting Zone C) will be planted where the mitigation site progresses from the lake margin to the north edge of Hueneme Road, and will include species such as narrow-leaved milkweed, blue wild rye, California poppy, and purple needlegrass. The lower elevations within the Northern Subarea *detention basin* will be planted with transitional species (Planting Zone A), and the higher elevations of the detention basin will be planted with grassland and shrub species (Planting Zones B and C).

Scrub shelterbelts with native emergent trees (Planting Zone D) will also be designed within the Northern Subarea habitat mitigation areas. Specifically, scrub shelterbelts will be implemented to create cover and foraging resources for raptor prey species and to create low perches for raptors. The scrub species recommended in these shelterbelts include California sagebrush, coyote brush, ashy-leaf buckwheat, deerweed, bush monkeyflower, lemonade berry, and sages. Less than 10% of the total foraging habitat being created shall be comprised of shrubs to maintain the goal of creating open foraging habitat.

Southern Subarea. The restoration proposed within the Southern Subarea includes (1) provision of wet herbaceous habitat within the proposed detention basin, and (2) transitional and upland mitigation areas within open space designated along several roads throughout the Southern Subarea (Figure 5). The planting plan for the *wet herbaceous foraging habitat* mitigation (Planting Zone A [Table 2, Figure 6]) includes establishing hydrophytic plant in the delineated wet foraging habitat mitigation areas (Figure 5) within the detention basin along the frontage road in the southern portion of the Southern Subarea. Example hydrophytic plant species to be planted in the detention basin include umbrella-sedge, alkali heliotrope, toad rush, water cress, scarlet monkeyflower, and pickleweed. *Transitional mitigation areas* (Planting Zone B) along the proposed bioswales (Figure 7) will be planted with species including western ragweed, mugwort, saltgrass, alkali rye grass, and deer grass. The *upland mitigation areas* adjacent to the bioswales will be planted with predominantly grassland species (Planting Zone C), including California brome, blue wild rye, miniature lupine, Coast Range melic, and purple needlegrass.

Scrub shelterbelts will also be designed within portions of the transitional and upland habitats to create cover and foraging resources for raptor prey species and clusters of native oak trees will be established for raptor perches (Planting Zone D).

Planting Installation Specifications

Planting installation, maintenance, monitoring, and reporting activities will be overseen by a restoration biologist familiar with restoration of native plants and habitats. All plantings will be planted in randomly spaced, naturally clumped patterns. The planting density should be augmented by approximately 25% to compensate for anticipated planting mortality. The size, location, and variety of the plantings shall be based on professional judgment of a qualified biologist, and will depend on the available mitigation area and opportunity for survival of planted species.

Figure 6. Example Planting Zone Schematic

Figure 7 – South Ormond Beach Grass-lined Channel (Bioswale Typical Design)

Container Stock Specifications and Installation Methods. Spacing of native grasses and herbs, if obtained as container plantings and not by seeds, will be approximately 3 feet-on-center. Spacing of native shrubs will be approximately 8 feet-on-center and will be planted in scattered patches and/or hedgerows. Any trees will be scattered and spaced no less than 20 feet-on-center. All container stock plant material shall be purchased from a native plant nursery approved by the restoration biologist, and selected from one-gallon container sizes. All container stock shall be weed- and ant-free, and shall not be inoculated to prevent heart rot. Container stock will be planted as follows:

- Excavate a hole 2 times the diameter and 1.5 times the height of the container.
- Add water to the hole, and let drain.
- Remove existing exposed roots from the hole.
- Clip root mass, if necessary, to relieve root binding.
- Place root ball in hole and cover with native soil. Root ball should be slightly elevated to accommodate settling. Care should be taken to not pile soil against the plant's crown.
- Create a waterwell around the hole of each container planting to focus supplemental irrigation toward the root system.
- Place organic mulch 3 inches deep on top of soil around plant.
- Irrigate immediately to saturate surrounding soil.

Seed Broadcast Methods. Seed will be broadcast-spread within the more upland and transitional mitigation areas along with appropriate container plantings to achieve an appropriate level of canopy cover for raptor foraging habitat. Seed mixes will include only species native to the southern California coastal area. All seed will be obtained from a commercial supplier. One part seed will be mixed with three parts sand and applied using a broadcast seeder. The seeded areas will be raked immediately prior to and following seeding.

Herbivore Protection. As currently planned, no herbivore protection or exclusion fencing will be required at this time. If browse damage is detected within the restoration areas, caging of individual plants or fencing of the entire restoration area will occur.

Mulch. Mulch may be placed around container plantings to minimize water loss and discourage weed growth. If used, it will consist of sterile rice straw or chipped material and will be added at a 1:5 ratio (one part mulch to five parts topsoil). Mulch would be applied to three or four inches deep and no more than two feet in diameter at each planting, but would not be placed directly against the main stem of a planting. All mulch shall be free of noxious weed seed, mold, and deleterious materials. Mulch will be prevented from entering flowing water.

Irrigation Plan

A detailed landscape irrigation plan shall been prepared specifically for the various planting zones within each mitigation site. Depending on seasonal timing, the restoration areas will rely predominantly on rainfall and inundation by surface flow for irrigation. However, initial watering will be conducted to establish the plantings.

A temporary above-ground irrigation system will be provided to initiate seed germination and promote proper container/cutting root establishment. The mitigation areas will be watered by an irrigation system, made up of multiple impact sprinkler or gear driven overhead sprinklers, to mimic the natural water cycle in the region. The intent of irrigation is to reduce mortality and increase the growth rate of plant materials during the first few months following planting and during the dry season. Irrigation will be provided for a period of approximately two years from planting (depending on climatic conditions), with irrigation being phased out during the fall/winter of the second year, unless unusually severe conditions threaten planting survival.

As-Built Conditions

Following plant installation, the project restoration biologist will assist in the preparation of a general as-built restoration and planting plan and will oversee the implementation of the monitoring program. As-built planting plans will be used as baseline information to track the success of container plantings and seeded areas throughout the monitoring period. The as-built plan will document any changes made during implementation, and will outline any modification made that deviate from this implementation plan to reflect as-built conditions.

7.0 MAINTENANCE ACTIVITIES

Each mitigation site must be monitored and maintained for a minimum of a three-year period and until success criteria are met. If success criteria are not achieved by the end of the third year, maintenance and monitoring shall continue a maximum of two additional years for a total monitoring period of five years.

Maintenance of the mitigation sites is essential to achieve restoration objectives and performance criteria. Failure to perform adequate maintenance is likely to result in non-attainment of the performance criteria. Although the vegetation proposed for the restoration areas is intended to be self-sustaining, its establishment and growth will be encouraged by aggressive maintenance, including a weed abatement program, irrigation upkeep and adjustments, and remedial/supplemental plantings, as necessary, for the duration of a three-year monitoring period. Other maintenance measures include trash removal, plant protection, erosion control, and monitoring visits. A qualified biologist/botanist will train maintenance workers in the identification of native plants to ensure only non-native plants are removed during weeding. General hand weeding will focus on control of invasive species. Weeds may be controlled with herbicides or hand pulling. Spraying of herbicides is only permitted in areas where noxious weeds are present, and may not be used where young native forbs are present.

Maintenance Schedule

The maintenance schedule for the habitat restoration sites will be monthly for the first year, and every other month for the second and third year. Weeding will be conducted, as needed, to prevent displacement of native species, which may include treatment or removal several times per year. All trash and foreign material will be removed regularly from the restoration site. Irrigation system maintenance will occur as needed to meet the goals of this plan.

Weed Abatement Program

According to The California Invasive Plant Council (CALIPC; http://www.cal-ipc.org/ip/definitions/index.php), invasive plants are plants that evolved in one region of the globe are moved by humans to another region. Some of them flourish, crowding out native vegetation and the wildlife that feeds on it. Some invasives can even change ecosystem processes, such as hydrology, fire regimes, and soil chemistry. These invasive plants have a competitive advantage because they are no longer controlled by their natural predators, and can quickly spread out of control. In California, approximately 3% of the plant species growing in the wild are considered invasive, but they inhabit a much greater proportion of the landscape. Cal-IPC focuses on plant species that impact natural areas, sometimes called "wildland weeds." Table 3 provides a list of example common invasive plant species that shall be removed from the project site during site preparation and throughout the maintenance period.

Table 3. Invasive Plant Species of Concern

Scientific Name	Common Name	Habit
Arundo donax L.	Giant reed	Perennial grass
Brassica nigra	Black mustard	Annual herb
Carduus pycnocephalus	Italian thistle	Annual herb
Centaurea melitensis	Tocalote	Annual herb
Centaurea solstitialis	Yellow star-thistle	Annual herb
Conium maculatum	Poison hemlock	Biennial herb
Euphorbia peplus	Petty spurge	Annual herb
Foeniculum vulgare	Sweet fennel	Perennial herb
Hirschfeldia incana	Summer mustard	Perennial herb
Malva parviflora	Cheeseweed	Annual herb
Medicago polymorpha	Common burclover	Annual herb
Melilotus alba	White sweetclover	Annual herb
Nicotiana glauca	Tree tobacco	Shrub
Oxalis pes-caprae	Bermuda buttercup	Perennial herb
Pennisetum clandestinum	Kikuyu grass	Perennial grass
Picris echioides	Bristly ox-tongue	Annual herb
Piptatherum miliaceum	Smilo grass	Perennial grass
Raphanus sativus	Wild radish	Annual herb
Ricinus communis	Castor bean	Shrub
Salsola tragus	Russian thistle/tumbleweed	Annual herb
Sonchus asper	Prickly sow-thistle	Annual herb
Sonchus oleraceus	Common sow-thistle	Annual herb
Sylibum marianum	Milk thistle	Annual herb
Tamarix ramosissima	Tamarisk	Tree/shrub
Tribulus terrestris	Puncture vine	Annual herb

It should be noted that many naturalized introduced plant species exist within natural ecosystems that are not necessarily invasive. For example, introduced annual grasses (wild oat, barley, and brome grasses) should not be considered invasive for the purpose of this restoration effort, since annual grasslands (void of invasive forbs) provide functional habitat for prey species and foraging raptors.

In the initial years of habitat establishment, emphasis will be placed on control of invasive exotic plants in the restoration sites, and on monitoring the success of the new plantings. Invasive species control is important to ensure decreased competition levels for the new plantings, and the control efforts will continue throughout the three-year monitoring period. The restoration site will be examined for the presence of undesirable invasive plant species. Control of invasive plant species will be overseen by qualified individuals experienced with habitat restoration techniques, and experienced with native-versus-nonnative plant species identification, to aid in the establishment of habitat function onsite.

Weeding will be conducted by hand monthly the first year and every other month during the last two years of the three-year monitoring period, or until it is determined that the installed plantings are not at risk from competition by invasive plants. Weed control activities will be intensified during the spring and early summer prior to the development of mature seeds produced by the target weed species (Table 3). Invasive plant materials will be disposed of in a manner and location as to prevent re-establishment.

8.0 MITIGATION MONITORING

Rational for Expecting Success

This mitigation effort is expected to be successful since the implementation plan and adaptive management plan proposed herein focuses on working with physical attributes to guide the restoration, and natural biological processes of the created system to aid in completing the project. The restoration areas have been selected in locations providing a minimum 75-foot buffer from human landscapes, which is generally required by the target raptor species. The wet herbaceous foraging habitat restoration areas have been selected in a location where surface flows will be directed via bioswales (post-project), and where water appears to naturally accumulate (pre-project); therefore, runoff and/or some degree of natural hydrology will be provided to the wetter mitigation area to create the desired site conditions and hydrologic regime over time. The plant palette is representative of the species and types of habitats known to be used by raptor prey species and raptors, and the native species selected for the plant palette will create the species richness and structural diversity beneficial to this mitigation effort. In addition, an intensive maintenance effort is planned to ensure that invasive exotic plant species do not create competitive conditions for the mitigation plantings, the temporary irrigation is providing adequate water during various seasonal changes, and any planting mortalities are replaced efficiently to maintain survival rates within required thresholds. This mitigation effort is also expected to be successful since a proactive monitoring program is developed herein to closely observe activities and circumstances that might decrease planting growth or habitat functions, such as changes in site conditions, planting mortalities, potential nutrient deficiencies, excessive coverage by invasive plant species, irrigation malfunctions, and non-use by raptor prey species and raptors. Regular and frequent monitoring will compare

growth patterns, survival rates, species richness, and structural diversity with established success criteria to ensure that each milestone is met to reach the ultimate goal of compensating for impacts to raptor foraging habitat.

Evaluating Design Uncertainties

The habitat restoration plans include certain aspects of design, implementation, and habitat recovery uncertainties, and monitoring will be conducted to evaluate those uncertainties. For example, hydrophytic vegetation is expected to become established within the Southern Subareas detention basin; however, it is uncertain as to whether the survival/expansion or mortality of hydrophytic vegetation that may occur within this area would be related to planting method (adult plants, tubers, or natural recolonization), soil saturation, and/or backfill type. Another example is that the as-built detention basin in the Northern Subarea may ultimately have increased hydrologic conditions than what is expected, which may not allow for the restoration of upland foraging habitat as required for that subarea. Yet another example is that this adaptive management plan is intended to provide functional habitat to attract the target raptor species discussed in Section 2 above, including special-status raptors. However, the conceptual mitigation designed herein does not provide assurance that special-status raptors, such as white-tailed kite and burrowing owl, will use the restoration areas created onsite or offsite. Monitoring information on such uncertainties will be used in evaluating adaptive responses.

Monitoring Schedule

As-built planting plans will be prepared for container plants and seeded locations immediately following plant installation to assist in tracking the success of the plantings over the minimum three-year monitoring period. For a minimum of three years after installation of this restoration plan, a biological monitor will monitor the mitigation area twice yearly, beginning in the spring or fall after installation of the vegetation and raptor enhancements have been completed (whichever season comes first). Sampling of the replaced and reconstructed habitats shall be conducted during those seasons for assessing peak growth for upland, transitional, and hydrophytic vegetation, accurate identification of plant species, and site conditions such as drought and inundation. Recommendations for irrigation will be provided upon monitoring visits. Ongoing coordination between restoration biologist and maintenance contractor regarding maintenance requirements/needs will be conducted frequently as part of the monitoring process. An annual monitoring report documenting the results of each fall mitigation monitoring session will be submitted by December 1st for the years 2017, 2018, and 2019. If success criteria are not achieved by the end of the third year, monitoring shall continue a maximum of two additional years for a total monitoring period of five years.

Overall Approach and Methods

The most important activity after the installation of plant material is the monitoring of the planted and seeded vegetation. Monitoring is very important for several reasons. First, time and resources may be wasted on measures that are ineffective or even counter-productive; monitoring can detect problems at an early stage and prevent the waste of resources. Second, refinements of mitigation measures are often needed to adjust them optimally to particular

settings; monitoring will help direct these adjustments and identify problem areas; this process is known as adaptive management.

A basic tenet of adaptive management is that collecting information and learning about the system while the program is underway are continuous activities, and that revisions and modifications should be made as suggested by project needs and findings. A qualified restoration biologist will monitor the installed plantings as part of this restoration and adaptive management plan for the proposed project for a minimum of a three-year period to determine if success criteria are being met. The data collection will include habitat monitoring to assess the adaptive management benchmarks and success criteria, as well as monitoring to collect data to evaluate design, implementation, and habitat recovery uncertainties. Monitoring will include qualitative assessments of general improvement of habitat function and planting vigor, as well as quantitative assessments of planting survivorship, native absolute percent canopy cover, species richness, and accounts of raptors and prey species/individuals that are foraging or inhabiting the restored habitats.

Botanical surveys will be conducted to document the increase in the number and proportion of native species over time. Botanical surveys will be conducted by identifying each plant species in the restoration area and preparing a list of native and non-native species found. The development of a native plant community and eradication of invasive non-native plant species that do not provide suitable habitat will be documented by the percent cover and percent native species in the restoration area as it changes over time and approaches that of undisturbed adjacent vegetation. Monitoring will also include an evaluation of the adequacy of irrigation, extent of weed infestation, and herbivory losses.

Permanent photo points will be established throughout the restoration areas to assist in tracking the success of the restoration program. Permanent photo points will be established during the preparation of the as-built planting plan, and ground view photos will be taken during each monitoring year from the same vantage point. The boundary of the as-built restoration areas will be mapped using GPS. An initial planting guide mapping the plantings onsite will be prepared using GPS data points and GIS interface.

Specific procedures the monitoring biologist shall perform during monitoring visits include:

1. Assess vegetation cover (species, structure) and progress toward meeting success criteria.
2. Record environmental factors (such as precipitation at the time of surveys and precipitation levels for months of the current year).
3. Assess the success of weed control program and recommend remedial action, if needed.
4. Assess the survival rate and growth of planted trees, shrubs, and grasses. At the time of planting, new plantings will be marked for the purpose of monitoring. The monitor shall select several planted clusters for photo monitoring and shall take close-up and long-distance digital images of each selected cluster during each monitoring visit.
5. Record observations of any special-status plant or wildlife species (federal or state threatened or endangered species and state sensitive species) during field monitoring.
6. Apply results of monitoring to refinement of mitigation and management measures on a continuing basis, as needed.

Performance Standards and Success Criteria

Appropriate success criteria are the single most important elements in the development of a successful compensatory habitat restoration plan and to document increases or decreases in target functions. These criteria provide a reliable and objective means of evaluating the capacity of the area to perform ecosystem functions.

Two types of success criteria will be used to determine whether habitat replacement is complete: (1) a general narrative criterion, and (2) the final quantitative criteria. The narrative success criterion simply describes when the overall program will be considered successful. As applied to a given habitat type, the narrative success criterion is a general statement of attainable or attained conditions of biological integrity for that habitat and establishes a positive statement about what should occur within a given biological entity. This adaptive management plan includes the general narrative criterion, as well as general descriptions of success criteria. In addition, this plan provides a general description of the quantitative criteria that will be used to implement the narrative criterion for the habitat type.

The following criteria will be used to aid in determining success over the three-year monitoring period:

- No more than 10% cover by weedy/invasive plant species after three years.
- 50% cover by native plant species after two years and 70% percent native cover after three years.
- At least 5 native plant species comprising dominant vegetative cover after three years.
- Observations or detections of rodents and/or raptors inhabiting or foraging within the restoration sites every monitoring year.

Species seeded onsite and observed colonizing the restoration areas will be monitored based on the extent of aerial cover compared to the total area planted as delineated on the as-built planting plans. Natural recruitment of indigenous plant species will be monitored at a reconnaissance-level, and those dominant species observed colonizing the restoration area will be qualitatively described. Native grasses, forbs, shrubs, and trees that colonize the restoration areas and aid in the reestablishment of habitat function during the monitoring program will be counted towards the overall success criteria for the restoration program.

Triggers for Adaptive Responses

In addition to the success criteria, triggers for adaptive responses were developed for the restored foraging habitats and to assist in achieving the primary success criteria. These triggers consist of a series of specific objectives for certain parameters of the habitats being restored at certain specified years after the restoration implementation. The triggers are based on measurements to determine if response actions may be required. Triggers are not alternative success criteria, but rather tools for managing the restored habitats, and taking corrective action where appropriate to assist in achieving success.

The triggers for remedial adaptive actions include the following:

- Greater than 25% planting mortality after planting or in any monitoring year in any mitigation area
- Greater than 10% cover by invasive plant species in any monitoring year in any mitigation area
- Less than 50% native cover in any monitoring year in any mitigation area
- Pest problem (house/feral cats, raccoons, etc. hunting or feeding on target prey species) detected or observed in any monitoring year in any mitigation area
- Insufficient rodent recruitment after the first monitoring year in any mitigation area
- No raptors frequenting/foraging anywhere within the mitigation sites after the second monitoring year

9.0 ADAPTIVE RESPONSES

Under this adaptive management approach, if success criteria are not being met, the three general management alternatives include:

1. Continuing the current monitoring for additional years
2. Implementing response actions that will help the recovery process
3. Re-evaluating the goals of the restoration project

This section discusses the response actions necessary for a successful recovery, documentation of any necessary response actions, when to re-evaluate the restoration goals, and when to determine success and determine project closure.

Response Actions

Monitoring for restoration criteria success will begin the first spring or fall after implementation (whichever season comes first). If the success criteria are not achieved in a given year, the available adaptive management options will include the continuation of monitoring (without other action) to assess trends over time, the performance of immediate response actions, and consideration of additional responses. Annual success thresholds will be compared to restoration performance and annual maintenance activities will be integrated to resolve any problems where performance of the restored habitat areas does not achieve expected goals. Based on the comparisons of monitored data with performance standards provided in annual reports, a qualified biologist or restoration specialist will recommend remedial actions to meet the performance standards. Additional responses, and the results of those responses, may require a re-evaluation of the monitoring results. In other instances, prior response actions conducted over several years may demonstrate, to the satisfaction of the City, that the habitat in such areas is unlikely to meet the success criteria even with further action.

The following presents the specific response action that should be implemented when one or more triggers are set.

Trigger 1: Greater than 25% of the planted and seeded material fails to germinate or dies after planting or in any year, and/or the native percent coverage within the restoration sites is less than 50% during any monitoring period.

> **Response Action 1:** To attempt to increase planting survival and native percent cover, maintenance and remediation will include, but are not limited to, replanting problem areas with seed and plant mixtures specifically designed to overcome the identified problem; identifying and controlling invasive plant species; and modifying the irrigation program. The recommended panting palette and restoration plan provided above will be reinstalled where needed to increase survivability and native percent cover. Because supplemental irrigation will be available within the restoration areas, remedial seeding and planting can take place near the end of the first growing season or at the start of the second growing season, depending on the extent of the activity. Any replacement plantings installed to achieve the requirements will be monitored with the same survival and growth requirements for two years after planting. Any implemented remedial measures will be fully documented in the annual reports.

Trigger 2: The weedy/invasive vegetative cover within the restoration sites is greater than 10%.

> **Response Action 2:** Weed abatement will be increased to a monthly schedule for the remaining monitoring years. Depending on the level of disturbance by invasives, and the species of concern, the weed abatement program would be intensified to attempt to eradicate the species from the restoration sites.

Trigger 3: Evidence of a substantial pest problem (i.e. house/feral cats or raccoons) is observed (pest observed hunting or feeding on target prey species) or detected (numerous remains of prey species found) during any monitoring year.

> **Response Action 3:** To address a pest problem affecting target prey species, trapping of such pests will be conducted to either eradicate or relocate pests from restoration areas, if feasible.

Trigger 4: Natural small mammal recruitment and foraging by target raptor species is not evident in the restoration areas. No target prey species are being observed or detected (i.e. burrows or scat) within the restoration areas.

> **Response Action 4a:** Response Action 1 would be implemented to enhance the restoration effort to attract the raptor prey mammal to the restoration areas.
>
> **Response Action 4b:** If after one year of increasing maintenance and implementing remediation measures no natural recruitment of target prey species is observed/detected, trapping will be conducted within the restoration areas onsite and/or offsite to determine presence/absence and to quantify small mammal populations inhabiting the restoration areas.

> **Response Action 4c:** If after remediation measures conducted under Response Action 4a yields no target raptor prey species, and if trapping conducted under Response Action 4b within the restoration areas yield no or insufficient prey species, then small mammal trapping of such species would be conducted in an offsite location (such as an area with a predetermined native rodent problem). Those captures would be relocated into restoration areas. Once introduced onsite, prey species would likely flourish in the unoccupied restored habitats. This would provide a prey base for target raptor species.

Trigger 5: It is demonstrated after five years of maintenance and monitoring (including the three initially required years plus two additional remediation years) that onsite mitigation is infeasible due to the constraints associated with urban development, and/or that ultimately a higher level of ecological functioning would result from offsite mitigation.

> **Response Action 5:** The portion of the restoration effort that failed, or the entire restoration effort, shall be re-implemented entirely offsite at an appropriate and superior location. The new restoration effort will be implemented in accordance with this adaptive management plan and implementation plan and will be maintained and monitored for a minimum three-year monitoring period. Partial credit may be given for portions of the initial restoration effort onsite and/or offsite, depending on the status and function of the habitats created at the end of five years.

Documentation Requirements and Reporting

Annual Adaptive Management Reports will be submitted to the City of Oxnard by January 31 of each year following habitat restoration implementation. Reports will be prepared by the project restoration biologist conducting the onsite monitoring. Each report will present the habitat monitoring data collected during the prior calendar year, including the database used to develop the report, and the results of the adaptive management evaluations conducted, including an analysis of habitat trends and recovery trajectories. In addition, collected data shall be evaluated on an ongoing basis (at a minimum, annually) to determine if modifications to the sampling design are warranted. Each Annual Adaptive Management Report will document evaluations of the triggers for adaptive responses (where relevant), assess progress toward meeting success criteria, and summarize any adaptive responses taken during the spring and fall monitoring sessions of the previous year. Each report will also include recommendations, as appropriate, for additional adaptive response actions, continuation or revision of the data collection program, termination of monitoring in successful habitats, or revisiting the habitat goals for specific areas.

The format of the Annual Adaptive Management Report should include the following:

- Introduction
  - Specific purpose/goals for the habitat restoration site for the specific year
  - Applicant, consultant, designer, and responsible parties contact information
  - Location, size, and type of habitat proposed for restoration (including map of restoration site and photo stations)
  - Dates of restoration implementation, previous maintenance, and monitoring
  - Summary of work completed

- Methods
  - Monitoring methodology
  - Detailed schedule of work performed
  - Location and number of stations sampled
  - Statistical methods used for data evaluation
  - Summary of field data taken to determine compliance with performance standards
  - List of approved success criteria
  - Methods used for any adaptive responses
- Results
  - Summary of maintenance activities, remedial actions, and adaptive responses (if implemented)
  - Graphs and/or tables summarizing data collection results and comparing monitoring results against performance standards for target dates
  - Photographic record of site during most recent monitoring visit at record stations
- Discussion
  - Discussion of the results and an overview of the restoration effort
  - Summary of progress towards success criteria
  - Effectiveness of any adaptive responses (if implemented)
  - Recommendations that will assist in meeting the overall success criteria
  - Recommendations for adaptive responses for the following year(s) (if necessary)

Re-Evaluation of Goals

Site-specific goals (i.e., designated habitat types for specific areas or even success criteria themselves) may turn out to be unrealistic for some locations. Re-evaluating the appropriateness of such goals may occur when monitoring has shown that the triggers or success criteria have not been met or are not likely to be met, despite efforts to achieve the benchmarks and success criteria. For example, if a portion of the restoration is determined not to be suitable for aquatic vegetation or if a portion of the restoration is determined not to be suitable for upland restoration, the goals for that area may need to be altered.

Success and Closure

When habitat conditions within the onsite and offsite restoration areas achieve the success criteria for each habitat type and are sustained for the number of years specified by those criteria, adaptive management and its associated habitat monitoring will end. The habitat restoration will only be considered complete after a minimum period of three years or until restoration success has been achieved and documented for a maximum of five years. If any portion of the onsite and/or offsite mitigation effort fails after a maximum of five years of maintenance, monitoring, and contingency measures, the portion that failed shall be implemented offsite at an appropriate or superior location and be maintained and monitored for a three-year monitoring period. The final monitoring report shall evaluate the success of the restoration effort in achieving the final success criteria. The final monitoring report will be notification of when the monitoring period has been completed and the approved success criteria have been met. The habitat restoration will only be considered complete by the City of Oxnard when they provide written verification of habitat restoration success.

10.0 FUNDING REQUIREMENTS

Habitat Restoration Implementation Plan Cost Estimate

The estimated cost of implementing 30.2 acres of onsite and/or offsite raptor foraging habitat restoration for the Northern Subarea, and 37.5 acres for the Southern Subarea, is approximately $10,000 to $15,000 per acre. Therefore, the cost for implementation for the Northern Subarea would cost approximately $302,000 to $453,000, and the cost for implementation for the Southern Subarea would cost approximately $375,000 to $562,000.

Offsite Mitigation Costs

Costs associated with offsite mitigation include the following:

- Potential Mitigation Site Identification/Biological Resources Assessment: $10,000 to $20,000
- Purchase Land/Record Conservation Easement/Funding Assurance: $5,000 to $10,000 per acre
- Prepare Long-Term Habitat Management Plan: $10,000 to $25,000
- Regulatory Agency Coordination/Approvals: $10,000 to $15,000

Long Term Maintenance and Monitoring Costs

The approximate cost of maintaining the onsite and offsite mitigation areas is estimated at $2,000 to $3,000 per acre, per year. Therefore, maintenance for the Northern Subarea mitigation requirement would cost approximately $181,200 to $271,800 for three years, and maintenance for the Southern Subarea mitigation requirement would cost approximately $225,000 to $337,500 for three years.

The approximate cost of monitoring the onsite and offsite mitigation areas is estimated at $3,000 to $5,000 per year. Monitoring for the Northern Subarea and Southern Subarea mitigation requirement would cost approximately $9,000 to $15,000 each over three years.

Endowment Requirements

If a conservation easement is required, a third party monitoring agency will require an endowment to manage the properties in perpetuity primarily to ensure the mitigation areas are being protected from any illegal actions, such as farming. Specifically, the endowment cost would pay for the third party to check on the condition of the properties, but is not intended for maintenance, annual monitoring, or repairs of damage to the mitigation sites. The endowment would cost approximately $20,000. The $20,000 invested at 4% interest would be $800 per year.

Cost Recovery for Contingency Actions

If the restoration effort begins to fail and adaptive responses are triggered, the cost recovery for the contingency/response actions shall be the responsibility of the property owner in which the response actions were implemented. A performance bond shall also be established for the cost of full re-installation as presented above under the Habitat Restoration Implementation Plan Cost Estimate subsection in the event that the restoration project fails and is required to be re-installed.

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