

## **EXHIBIT 2**

### **Habitat Enhancement Plan For the Manchester Site Encinitas, California**

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# CHAPTER 1

## INTRODUCTION

### Project Background

In August 2003 the State Coastal Conservancy authorized the disbursement of funds to the San Elijo Lagoon Conservancy (SELC) to complete enhancement design, environmental review, and permitting for the Manchester Enhancement Project. This document presents the enhancement strategies, and 5-year monitoring and maintenance program for the project.

### Project Location and Description

The Manchester Enhancement Project site is located two miles east of the Pacific Ocean in the City of Encinitas in northern San Diego County (Figures 1 and 2). The Manchester property consists of two parcels (APN# 262-073-25-00, 262-073-03-00) totaling 18.9 acres adjacent to Escondido Creek along the northeast boundary of San Elijo Lagoon Preserve (Figure 3). Manchester Avenue is immediately to the west, and El Camino Real is approximately 750 feet to the north of the project area. Lux Canyon Creek runs through the property.

The San Diego County Water Authority (SDCWA) has proposed to create wetlands on a portion of the site as compensatory mitigation site for permanent wetland impacts occurring elsewhere in the County (EDAW 2003a). The SDCWA wetland creation area comprises approximately 8.68 acres within three County-owned parcels, with approximately 5.5 acres occurring on the Manchester Enhancement Project site (Figure 4). The disturbed habitat outside the wetland creation boundary will be enhanced in accordance with the methods outlined in this habitat enhancement plan.

The Manchester site has been disturbed by past land uses, specifically grazing, which appear to have contributed to the current low cover of native vegetation. While the property was extensively used for agriculture until the late 1980's, native habitat has reestablished on portions of the site. The dominant upland vegetation types are *Isocoma* scrub, disturbed *Isocoma* scrub, disturbed coastal sage scrub, and ruderal land (Figure 5). The coastal California gnatcatcher (*Polioptila californica californica*), a federally-listed species, is known to occupy portions of the site. Least Bell's vireo (*Vireo bellii pusillus*), a state and federally-listed species, has been recorded on-site but does not currently nest there (EDAW 2003b). Wetland plant communities occurring on-site include southern willow scrub, alkali marsh, and brackish marsh (Figure 5). Several exotic plant species, including mustard (*Brassica nigra*, *Hirschfeldia incana*), pampas grass (*Cortaderia selloana*), and nonnative acacia (*Acacia* sp.) pose an ongoing threat to the quality of the upland and wetland habitat on-site.

# Project Location

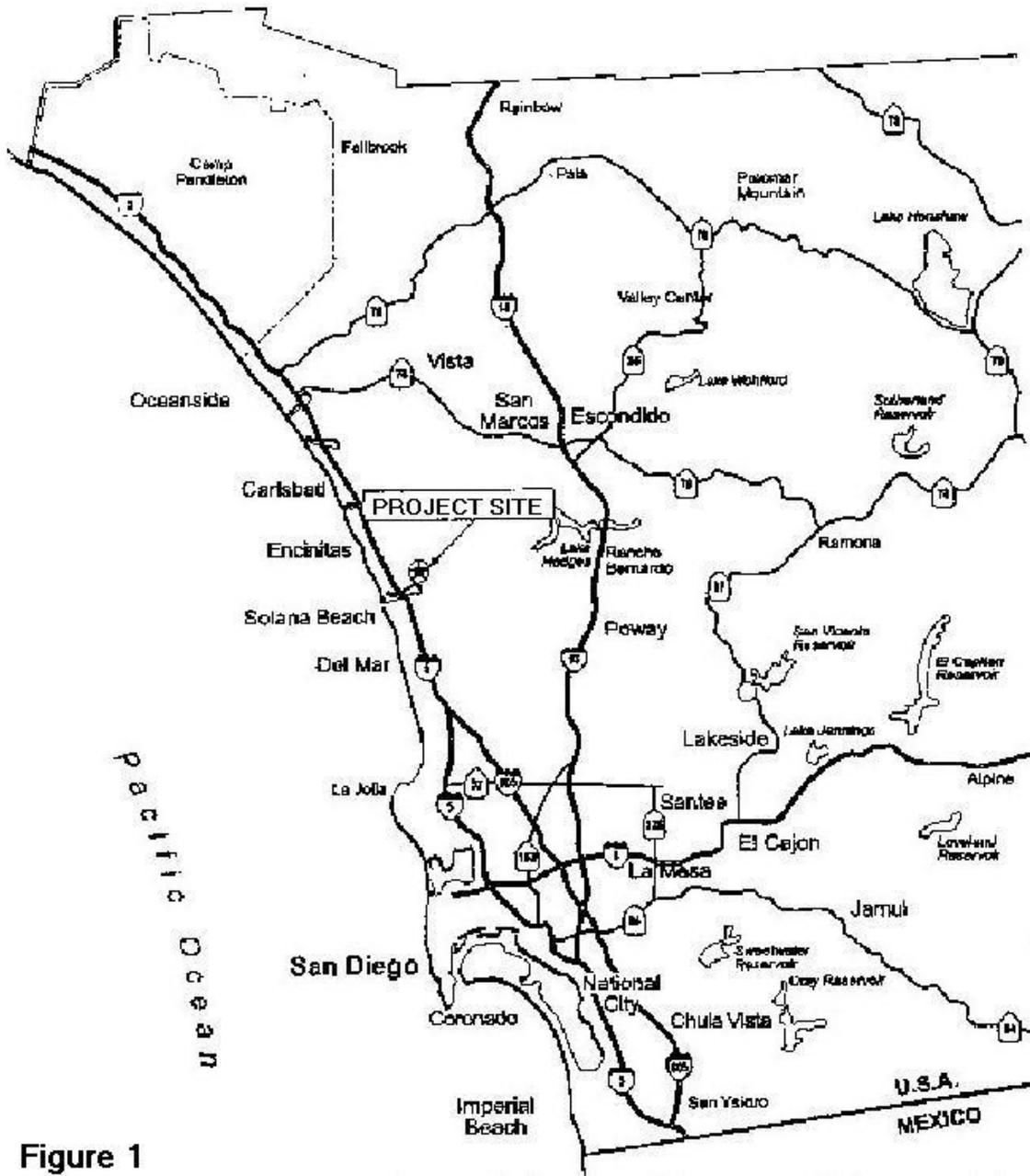


Figure 1

## Manchester Site Location

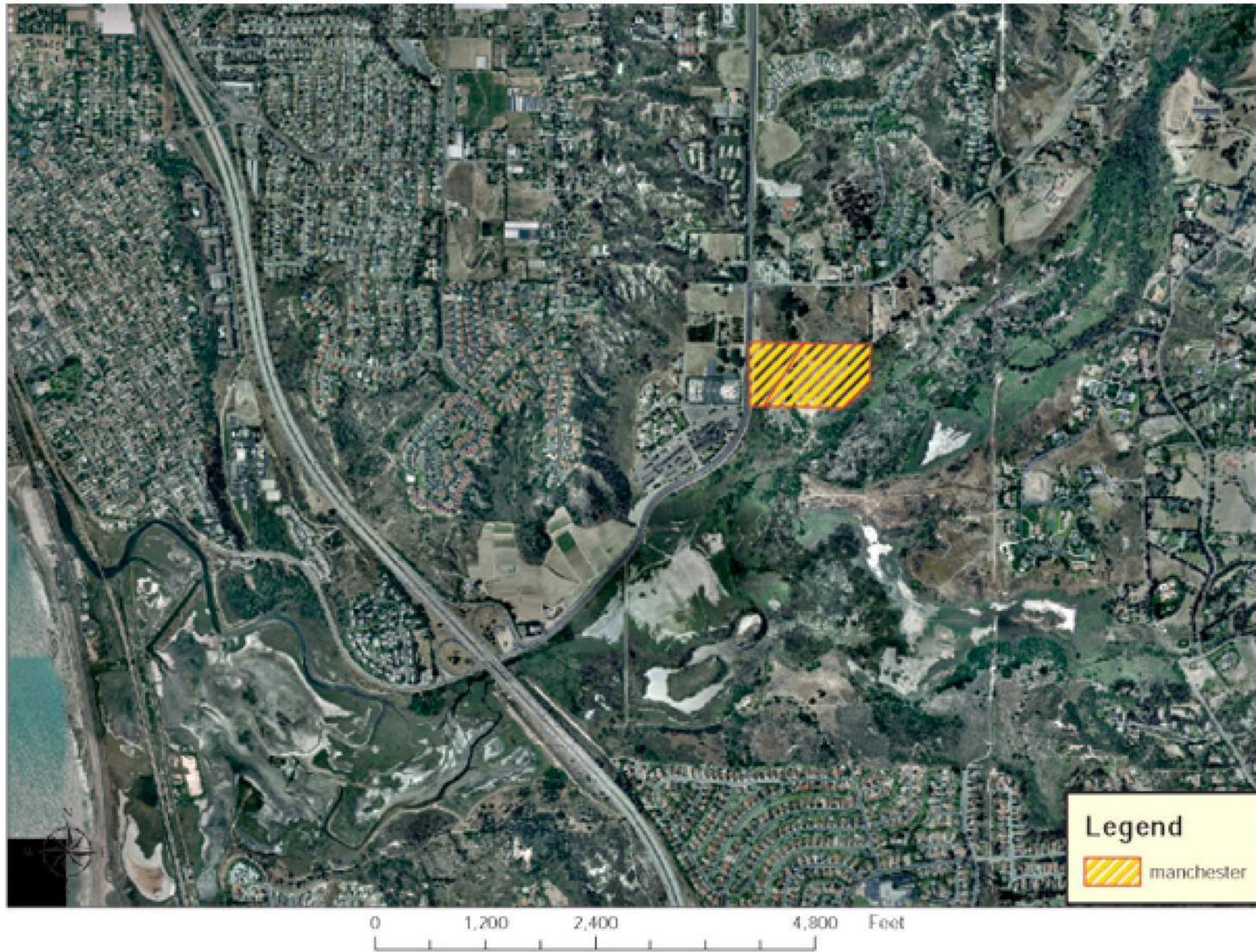


Figure 2

# Manchester Parcel Map

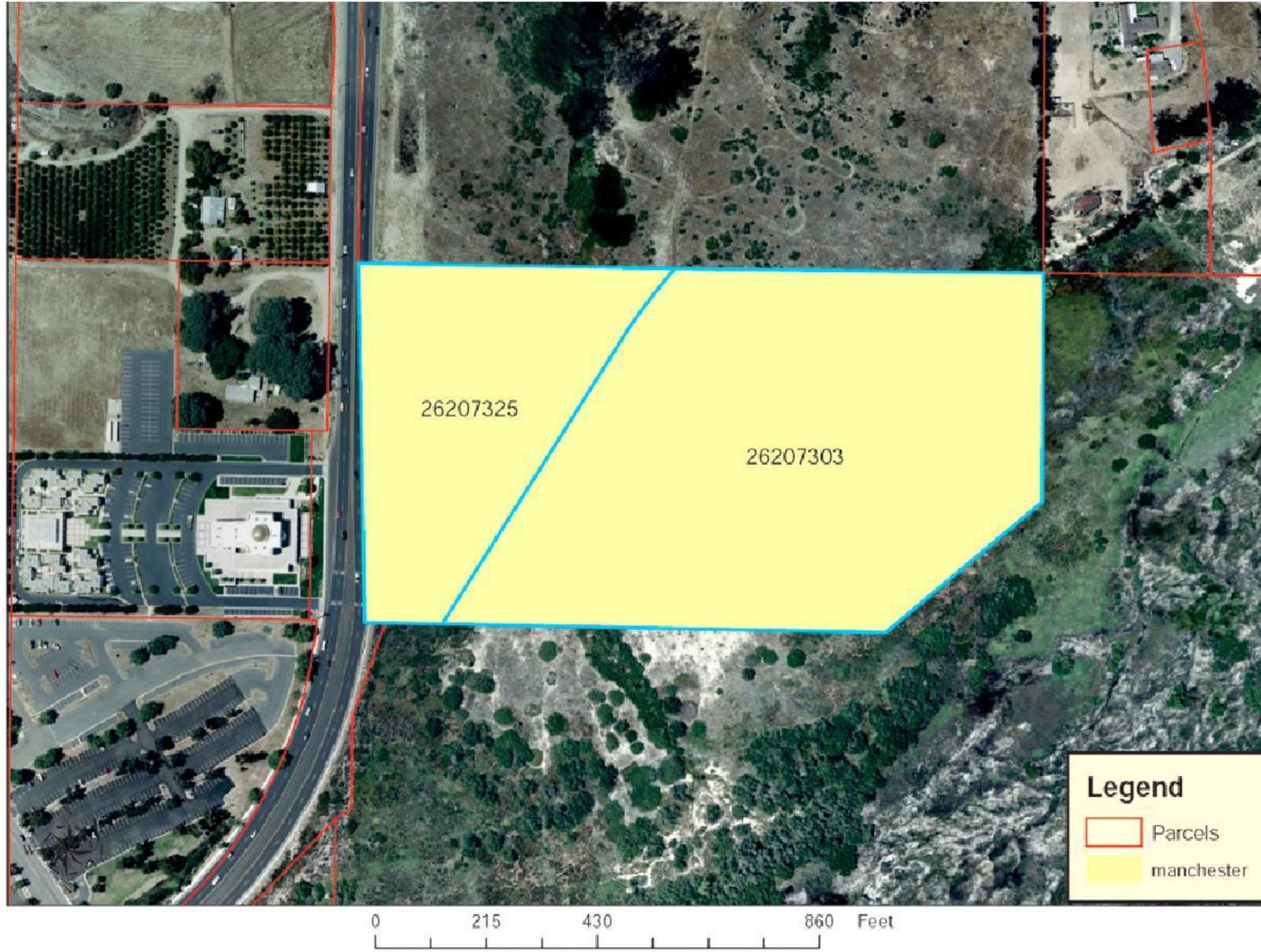


Figure 3 [Assessor's Parcel Numbers]

# County Water Authority Mitigation Area



**Figure 4 Mitigation Site for Manchester restoration area**

# Vegetation / Habitat Survey

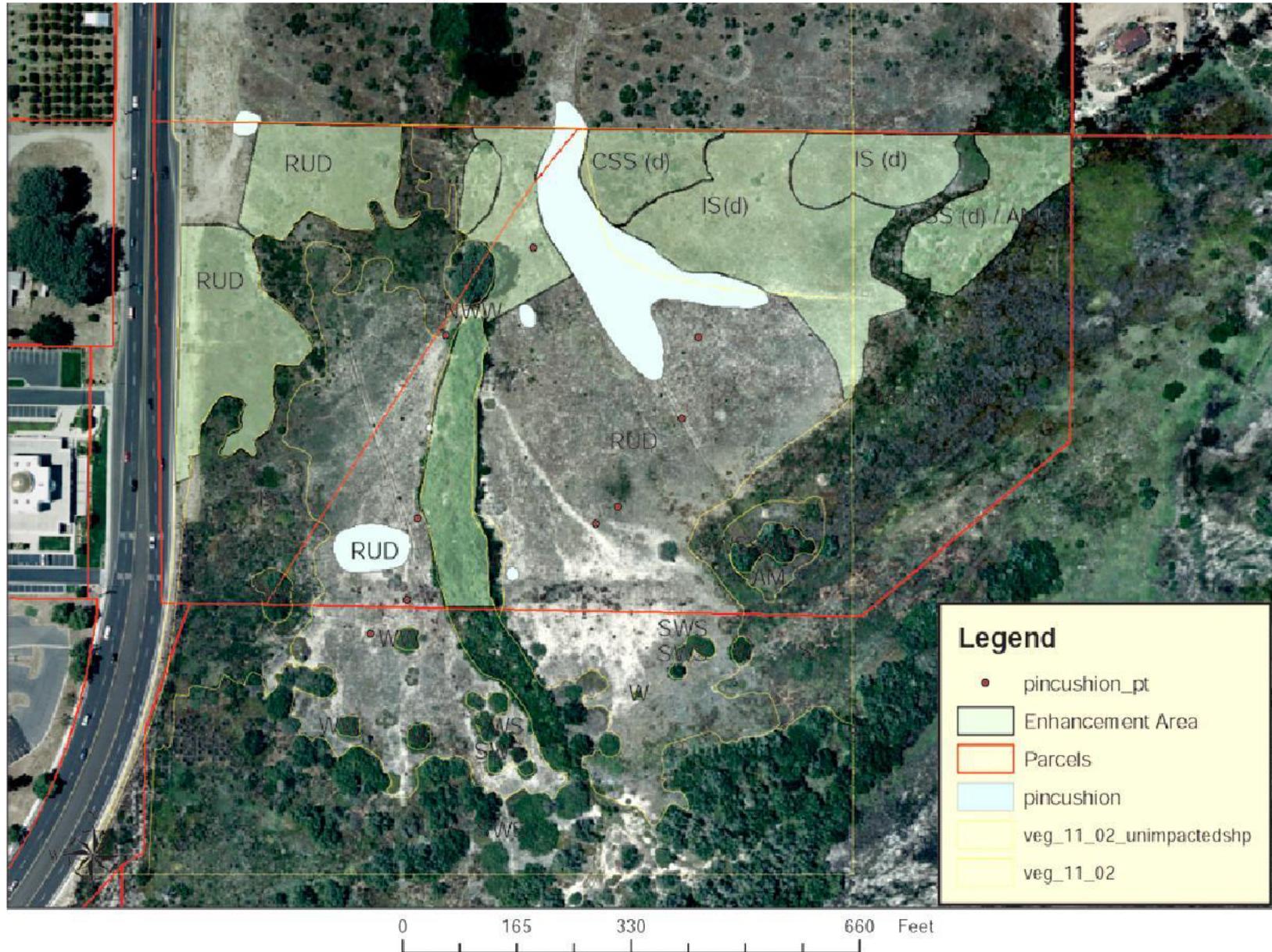


Figure 5 Data from field surveys by County Water Authority and SELC

Soils on-site primarily consist of Corralitos loamy sand. According to U.S. Department of Agriculture *Soil Survey of the San Diego Area, California* (1973), Corralitos loamy sands are “somewhat excessively drained, very deep loamy sands that formed in alluvium derived from marine sandstone.” These soils are found in “narrow valleys and on small alluvial fans.” The typical profile for this soil group is loamy sand for a depth of 0 to 43 inches from the surface, and sand from a depth of 43 to 60 inches, which is underlain by hardpan (*i.e.*, hard, unbroken subsoil). The Corralitos loamy sand soil group is listed as subject to “severe” erosion by water.

### **Sensitive Species**

There have been several biological surveys done on the site over the past decade (Table 1). A recent detailed description and analysis of biological resources on the Manchester site has been presented in the *Biological Assessment for the San Diego County Water Authority Emergency Storage Project Manchester Avenue Wetland Mitigation Site* (EDAW 2003b) and the *Emergency Water Storage Project Supplemental Environmental Impact Report for the Manchester Site Wetland Creation Plan* (EDAW 2003c).

Portions of the Manchester site are occupied by the coastal California gnatcatcher. A pair of coastal California gnatcatcher was detected during six protocol-level surveys conducted at the Manchester site between March 27 and May 9, 2002 (EDAW 2003a). The coastal California gnatcatcher pair’s on-site activity consisted of foraging in intact *Isocoma* scrub habitat west of Lux Canyon Creek. Several of the initial detections made during the course of the surveys occurred off-site to the north of the property boundary. Based on the observed behavior of the coastal California gnatcatchers within the property boundaries, the *Isocoma* scrub habitat in the northwestern portion of the site is utilized by the species (Figure 5), although no nesting or breeding behaviors were noted during the surveys (EDAW 2003b).

Orcutt’s pincushion (*Chaenactis glabiuscula* var. *orcuttiana*), a CNPS List 1B species, occurs on-site (Figure 5). Enhancement work will not occur in these areas.

Focused surveys for pacific pocket mouse (*Perognathus longimembris pacificus*) were conducted during the first week of May 2002. Pacific pocket mouse was not detected during these surveys. The northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*), a State Species of Special Concern, was detected on-site outside the enhancement areas discussed in this plan.

**Table 1**  
**Summary of Biological Studies Conducted at the Manchester Site**

<b>Type of work</b>	<b>Year conducted</b>	<b>Results</b>	<b>Notes</b>
Vegetation Mapping	1996	Five habitat types mapped	18.86 acres mapped including 3.23 acres of <i>Isocoma</i> scrub, 12.6 ruderal, 1.97 alkali marsh, 0.39 southern willow scrub, 0.67 acre unvegetated channel; March 1996 aerial photo used as basemap.
Wetland Delineation	1997	Jurisdictional wetlands present on-site	Formal wetland delineation report not located; Woodward-Clyde did original delineation; modified in field by Corps in 1997; final acreage not reported in Manchester Sport Complex EIR.
Botanical Surveys	1995, 1996	69 species recorded	59% native, 41 percent nonnative; conducted early spring and late summer; sensitive species included southwestern spiny rush and Torrey pine.
General Wildlife Surveys	1992, 1995, 1996	15 bird species, 3 mammal species, 5 reptile species, 1 amphibian species, and 5 butterfly species were detected	Sensitive species included orange throated whiptail and San Diego horned lizard; see EIR for further details.
Gnatcatcher Surveys	1992, 1996, 2002	Detected	An EDAW restoration ecologist detected gnatcatchers on-site several times (not a formal surveys); subsequent formal surveys have confirmed that a pair of gnatcatchers occupies intact scrub habitats on-site.
Pacific Pocket Mouse Surveys	1996, 2002	Not detected	In 1996, three species detected (cactus mouse, deer mouse, and western harvest mouse); these species are in addition to three mammalian species detected in general wildlife surveys. In 2002, four species detected (cactus mouse, deer mouse, western harvest mouse, and northwestern San Diego pocket mouse).

**No Effect Determination**

The work proposed in this plan is not expected to negatively affect sensitive species. The enhancement work occurs in disturbed and ruderal habitats outside the areas where Orcutt's pincushion is known to occur, or that are currently used by the gnatcatcher (Figure 5). The enhancement work is limited to exotic removal and control, seeding and planting, and monitoring. The work does not involve earth moving or heavy equipment within or adjacent to habitat known to be used by the gnatcatcher. Seeding, plant installation and exotic removal will occur outside the gnatcatcher breeding season. Because the timing and nature of the project is not anticipated to affect the coastal California gnatcatcher, the project has received a no effect determination.

## **Enhancement Goals**

The ultimate goals of the habitat enhancement work are to (1) improve the quality of disturbed and ruderal upland habitat for the gnatcatcher, and (2) remove and control exotic plant species within the existing riparian corridor to provide higher quality habitat for resident wildlife as well as migratory bird species such as the least Bell's vireo. Ruderal and disturbed upland habitats will be enhanced to increase the relative cover of native vegetation; intact upland habitats are not part of the enhancement work proposed in this plan.

In ruderal upland areas the specific goal is to re-establish appropriate native vegetation and control invasive exotics at an ecologically acceptable level during the 5-year maintenance and monitoring period. In areas of disturbed native habitat the goal is to remove and/or reduce the cover of invasive exotic plant species and increase the cover and density of native vegetation within the 5-year maintenance and monitoring period in accordance with the performance standards outlined in Chapter 4.

Native plant revegetation in the areas where exotic plants are removed will be accomplished through a combination of natural recruitment and seeding and/or planting. Approximately 6.5 acres of upland habitat would be enhanced on-site through the removal and control of invasive exotic plant species, and the reseeded of disturbed natural habitats and ruderal lands (Figure 6). Exotic plant species within the 0.77 acres of existing riparian corridor of Lux Canyon Creek will also be removed and controlled.

The seed mix used to revegetate the upland areas will primarily be composed of *Isocoma menziesii*. A more diverse coastal sage scrub seed mix has been developed for use in disturbed coastal sage scrub and ruderal areas. A detailed discussion of enhancement methods and seed mixes is presented in Chapter 2.

## **Specific Project Objectives**

At the end of the 5-year monitoring and maintenance period the enhancement areas will:

- Have less than 10 percent absolute cover of targeted exotic species
- Have no less than 75 percent absolute cover of native species

# Manchester Restoration / Enhancement Areas



Figure 6

## CHAPTER 2 ENHANCEMENT METHODS AND SPECIFICATIONS

### Enhancement Strategies

A total of nine enhancement areas (EAs) have been identified (Figure 6). The recommended enhancement strategies will vary by enhancement area (EA). The enhancement strategies to be implemented in each of the enhancement areas are discussed below.

In EA 1 pampas grass and palm trees (*Washingtonia robust* and *Phoenix canariensis*) will be removed, followed by planting and reseeding of native species (*Isocoma menziesii* and *Baccharis pilularis*). The control of any subsequent regrowth of pampas grass and palms will continue throughout the 5-year monitoring and maintenance period. Scattered individuals of pampas grass and fan palm occurring in the undisturbed habitats to the southwest will be killed in place and the surrounding areas will be periodically monitored to ensure the infestation does not spread.

In EAs 2, 4, 6 and 7, a high diversity coastal sage scrub seed mix (Table 2) will be applied after hand thinning of dead weeds and brush. Hand thinning of nonnative weeds will continue throughout the five-year maintenance and monitoring period. Herbicide control will be used as needed. Container plants of the dominant species (*Artemisia californica* and *Eriogonum fasciculatum*) may be installed in these areas when seed germination rates are low and/or establishment and growth is poor.

EAs 3 and 5 will receive a low diversity *Isocoma* seed mix (Table 3) and ongoing nonnative weed control. No thinning, clearing, or removal will occur in these areas.

Willow cuttings (*Salix lasiolepis*) will be planted in EA 8. Willow cuttings should be soaked prior to planting, and should be of sufficient length to make contact with the saturated soil matrix.

Portions of Lux Canyon Creek (EA 9) will be enhanced through the removal of exotic species, primarily acacia and pampas grass, within the riparian corridor. Reseeding and/or replanting are not proposed in this area.

**Table 2**  
**Coastal Sage Scrub Seed Mix<sup>1/2/3</sup>**

Scientific Name	Common Name	Pounds per Acre	Minimum Percent Purity/Germination	Pounds of Pure Live Seed (PLS) per Acre <sup>4</sup>
<i>Artemisia californica</i>	California sagebrush	4	15/40	0.24
<i>Baccharis pilularis</i> ssp. <i>consaguinea</i>	Coyote brush	3	2/40	0.03
<i>Eriogonum fasciculatum</i>	Flat-top buckwheat	7	10/65	0.50
<i>Eriophyllum confertiflorum</i>	Golden-yarrow	3	30/60	0.55
<i>Eschscholzia californica</i>	California poppy	1	98/75	0.75
<i>Gnaphalium californicum</i>	California everlasting	3	10/75	0.23
<i>Isocoma menziesii</i> ssp. <i>veneta</i>	Coastal goldenbush	4	20/40	0.32
<i>Lotus scoparius</i>	Deerweed	5	90/60	2.7
<i>Malosma laurina</i> *	Laurel sumac	2	95/60	1.14
<i>Mimulus aurantiacus</i>	San Diego monkeyflower	4	2/55	0.05
<i>Nassella pulchra</i>	Purple needlegrass	2	70/60	0.84
<i>Rhus integrifolia</i> *	Lemonadeberry	1	90/50	0.45
<i>Salvia apiana</i>	White sage	2	70/50	0.70
<i>Sisyrinchium bellum</i>	Blue-eyed grass	1	95/75	0.72
<b>Total</b>		<b>42</b>		<b>9.22</b>

<sup>1</sup> Seed shall be applied by hand and raked into the soil, or hydroseeded with standard amendments (*i.e.*, cellulose fiber mulch and organic soil stabilizer).

<sup>2</sup> Seeds shall be collected within a 25-mile radius of the site. Seeds that cannot be collected from the immediate project area will be provided from the closest available locations.

<sup>3</sup> Any potential substitutions must be approved by the project's restoration ecologist.

<sup>4</sup> The pounds per acre of PLS have been rounded up to the nearest hundredth. The pounds per acre of seed to be applied shall be adjusted based on the actual percent purity and germination rates to achieve the specified pounds per acre of PLS.

\* To enhance germination, the seeds of species marked with an asterisk shall be scarified prior to application.

**Table 3**  
***Isocoma* Scrub Seed Mix**

Scientific Name	Common Name	Pounds per Acre	Minimum Percent Purity/Germination	Pounds of Pure Live Seed (PLS) per Acre <sup>4</sup>
<i>Isocoma menziesii</i> ssp. <i>veneta</i>	Coastal goldenbush	100	20/40	8.0
<i>Gnaphalium californicum</i>	California everlasting	10	10/75	0.75
<i>Ambrosia psilostachya</i>	Western ragweed	3	10/75	0.23
<i>Heterotheca grandiflora</i>	Telegraph weed	3	10/75	0.23
<b>Total</b>		<b>116</b>		<b>9.2</b>

### **Enhancement Methods**

Habitat enhancement should be implemented in accordance with the following generalized steps.

1. Perform site preparation, including removal of exotic plant debris and trash.
2. As needed, ensure the site is decompacted and appropriate erosion control measures are implemented (since the native soil will be retained in place, no soil amendments are expected to be necessary).
3. Seed enhancement areas in late fall.
4. As needed, install container plants or cuttings and provide water during installation.
5. Monitor revegetation/enhancement areas for 5 years to determine whether seeding and/or planted areas are meeting performance goals.
6. As needed, re-apply seed by hand and rake into the soil.
7. As needed, provide temporary irrigation (irrigation is discussed in Section 3.8).

### **Seed Specifications**

The following seed specifications will be followed to the extent practicable.

- Seed shall be provided by a qualified supplier and seed shall be collected from the project vicinity (within the same watershed or a 25-mile radius) to the extent feasible. Preferably, seed shall be collected from the immediate project area. All seed must be delivered to the site in sealed and labeled packaging along with a California State Agricultural Code seed certification including the supplier's name, geographic location and collection date, and the tested purity and germination percentage rates. The restoration ecologist will inspect the seed prior to its application on-site and shall reject seed lacking certified tags or not conforming to specifications.
- Seed application rates are provided in Tables 2 and 3. If the delivered seed differs from specified purity and germination rates, the total pounds per acre rates shall be adjusted accordingly to achieve the specified pounds of pure live seed (PLS).
- Prior to seeding, the restoration ecologist will confirm the landscape crews have performed proper site preparation. Site preparation shall include removal of weed species and weed litter/debris and trash, sufficient decompaction and roughening (*i.e.*, scarification) of the soil surface, and implementation of erosion control materials where necessary. Seed shall be applied after site preparation, container plant installation (in areas where container plants are proposed), and preparation of straw wattle trenches (if applicable), but prior to installation of any erosion control matting (not proposed).
- Seed shall be applied by hand with handheld mechanical spreaders, and must be applied as evenly as possible and raked into the soil. The SELC project manager and restoration ecologist can also approve the option to apply seed by hydroseeding, which could include natural fiber mulch or bonded fiber matrix (BFM) in the slurry for erosion control.

### **Container Plant Specifications**

Container plants will be installed as necessary to accomplish the objectives of the project. The following container plant specifications will be followed to the extent practicable.

- Container plants shall be provided by a qualified nursery and plants shall be propagated from propagules from the project vicinity (within a 10-mile radius) to the extent feasible. Preferably, plants shall be propagated from materials from the immediate project area. Plants shall be certified to be free of Argentine ants prior to delivery on site.
- The restoration ecologist will confirm all plants are delivered to the site in a healthy and vigorous condition before they are installed. Larger container sizes are acceptable if approved by the restoration ecologist. The restoration ecologist will also help direct plant layout before they are installed.

## **Container Plant Installation Steps**

1. Dig a hole two times as deep and three times as wide as the container. Break up soil clods and avoid a smooth-sided “bathtub” effect in the hole. Fill the planting hole with water and allow it to drain completely into the soil.
2. Partially backfill the hole with native soil to allow planting at the proper depth. Moisten and gently tamp the backfill into place. Remove the plant from its container and place on top of the moistened backfill so the plant collar is approximately 1" above finish grade. Then backfill the remaining hole with native soil.
3. Create a planting basin berm, roughly 2' in diameter around the plant, and apply 1" to 2" of coarse, organic, weed-free mulch inside the berm. Then thoroughly water and allow to drain.

## **Irrigation**

Natural rainfall should be sufficient to germinate and establish seeded species; therefore temporary irrigation will only be used as a remedial measure in conjunction with the installation of container plants. In a remedial situation, temporary irrigation will still be minimized to the extent feasible, since over-watering can promote plant diseases, poor root development and plant performance, and a proliferation of pests (*e.g.*, competing weed species). Individual areas will be assessed to determine the most feasible and appropriate method. If deemed necessary to meet the goals of this project, any of the following irrigation methods could be used alone or in combination as appropriate: hand-watering (*e.g.*, with buckets), water release products, and/or use of drip, bubbler, or overhead spray systems. The irrigation schedule would be designed to mimic an average- to above-average rainfall year. The frequency of watering will be varied to replicate natural variability, and generally less frequent, deeper waterings will be used to promote deeper root development. Water may be provided by potable or reclaimed water hook-up, or from a temporary pump system that obtains water from the creek. Once the remedial container plants are established, irrigation will be discontinued and any irrigation components (*e.g.*, pipe, drip tubing, and bubblers) will be removed from the site.

## **Erosion Control**

The enhancement areas are predominately flat to gently sloping and erosion is not anticipated to be a significant problem. The enhancement work in areas A and B involves seeding only; no soil disturbances are proposed and erosion control will likely not be necessary. The exotic removal work in Area C may result in large areas of bare ground; however hydroseeding of this area is expected to stabilize the soils. Erosion control measures will be implemented in the field as needed to prevent potential problems from occurring. Erosion control measures shall include, but are not limited to mulch, use of natural fiber matting, straw wattles, gravel bags, and application of bonded fiber matrix (BFM) or stabilizing fiber mulch (SFM).

## Weed Control

This section provides guidance and recommendations on invasive exotic (*i.e.*, "noxious") species removal methods. For this plan, exotics are those species recognized by California Exotics Pest Control Council (CalEPCC) and the University of California Statewide Integrated Pest Management Project.

Nonnative (weed) control during the maintenance period will involve (1) eradication of resprouting nonnatives that were initially cut or treated during the enhancement installation phase, and (2) eradication of target nonnatives that establish during the maintenance and monitoring period. The primary nonnatives that occur or have the potential to occur on-site are identified along with the proposed methods of control in Table 4. Information on life form, growth habitat, reproduction, and removal/eradication methods are provided from *Invasive Plants of California's Wildlands* (Bossard et al. 2000), the California Exotic Pest Control Council (CalEPCC) website, and the University of California Statewide Integrated Pest Management Project. These sources were reviewed for information on physical, biological [*e.g.*, insects and fungi], and chemical/herbicide control methods. The potential control methods are presented here to help illustrate possible methods. The final methods chosen will be based on recommendations provided by a licensed Pest Control Advisor.

Some nonnatives may be cut or hand-pulled (*e.g.*, when they are small and the entire root system and/or stolons and rhizomes can be removed), but many species require herbicide application, sometimes in conjunction with cutting, to be eradicated. As required by law, the final recommendations for herbicide use will be made by a licensed Pest Control Advisor and applied under the supervision of a licensed Pest Control Applicator. If weed ecology information indicates herbicide application is necessary to eradicate certain species, then it is recommended that direct application (instead of foliar sprays) and selective herbicides be used. Most weeds should be eradicated before they reach 12" high or set seed. In accordance with some control recommendations, nonnatives such as arundo and eucalyptus, for example, may have 3' to 6' high resprouts before receiving follow-up eradication treatment. All weeds should be eradicated by hand or herbicide treatment each season before they set seed. All weed debris will be properly disposed of off-site.

**Table 4  
Target Exotic Species and Control Methods**

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
Arundo ( <i>Arundo donax</i> ) also known as giant reed	perennial grass	erect to >20 feet tall (rhizomatous)	roots and rhizomes	spraying or direct treatment of glyphosate to uncut or cut stems between late spring and fall
Bermudagrass ( <i>Cynodon dactylon</i> )	perennial grass	prostrate, less than 1 foot high	seed and vegetatively	place black polyethylene plastic on top for 6 to 8 weeks in the summer to prevent sunlight from reaching plants, or apply postemergent herbicide to leaves and stems when they are growing vigorously from spring to late summer
Black mustard and Field mustard ( <i>Brassica nigra</i> and <i>B. rapa</i> )	annual herbs	erect 1 to 4 feet tall	seed	hand pulling when feasible, or herbicide application before it flowers
Brome grasses and Wild Oats ( <i>Bromus</i> ssp. and <i>Avena</i> ssp.)	annual grasses	erect 0.5 to 2 feet tall	seed	hand pulling or herbicide application (glyphosate or other approved) in spring before seed set
*Castor-bean ( <i>Ricinus communis</i> )	perennial shrub	erect, branching 5 to 15 feet tall	seed	hand pulling is effective if the majority of root system is removed, or cut-stump treatment with application of 25% glyphosate
Curly dock ( <i>Rumex crispus</i> )	perennial	erect 2 to 5 feet tall	seed	hand pulling when feasible, or herbicide application
Horseweed ( <i>Conyza canadensis</i> )	annual herb	erect 2 to 10 feet tall	seed	hand pulling when feasible, or herbicide application
Hottentot-fig ( <i>Carpobrotus edulis</i> )	succulent perennial	prostrate, creeping	vegetatively and by seed	hand pulled ensuring all live shoot segments must be removed, or application of glyphosate at concentrations of 2% or higher with surfactant
Mexican fan palm ( <i>Washingtonia robusta</i> )	perennial tree	erect 60 to 100 feet tall	seed	cut main stem to remove apical meristem.
Pampas grass ( <i>Cortaderia</i> ssp.)	perennial grass	erect 6 to 8 feet tall	seed (root crown resprouts)	physically remove ensuring the entire crown and top sections of roots are removed, or treatment with a post-emergent application of glyphosate at about a 2% solution with surfactant

Species	Life Form	Growth Habitat	Reproduction	Potential Control Methods
Redstem filaree ( <i>Erodium cicutarium</i> )	Winter annual or biennial herb	Spreading or erect, generally from a rosette	seed	preemergence application of napropamide in early fall or post emergence applications of glyphosate, 2,4-D, or paraquat late fall through spring
Sweet fennel ( <i>Foeniculum vulgare</i> )	perennial herb	erect 4 to 10 feet tall	seed or root crown	apply amine and ester formulations of triclopyr or glyphosate in spring
Tree tobacco ( <i>Nicotiana glauca</i> )	perennial shrub	erect 6 to 15 feet tall	seed	hand pull if the root system can be removed, or cut and apply triclopyr or glyphosate.
Tocalote ( <i>Centaurea melitensis</i> )	annual herb	erect 2 to 3 feet tall	seed	repeated mowings at 3-week intervals, or spring or fall application of herbicide
White clover and Indian clover ( <i>Melilotus albus</i> and <i>M. indicus</i> )	annual herbs	erect 2 to 5 feet tall	seed	hand pulling when feasible, or herbicide application before it flowers
Wild radish ( <i>Raphanus sativus</i> )	annual herb	erect 1 to 3 feet tall	seed	hand pulling when feasible, or herbicide application before it flowers

## Trash Removal

As necessary, trash will be removed by hand from the enhancement areas. This includes trash left by enhancement work or trash deposited in the enhancement areas by wind or human action. Trash will be properly disposed of off-site.

## Plant Care

Plant care will be sufficient to help ensure the enhancement areas meet performance goals on schedule. Native plant care includes maintaining proper soil conditions, removing competing weed species, providing sufficient supplemental water if necessary, and identification of any significant disease or pest problems. Use of rodenticides is not proposed at this time. If herbivores are found to be a significant problem, seedlings and plants in the affected area will be caged.

If enhancement areas are not meeting performance standards, then those areas will be reseeded and possibly planted. Most planting or reseeding should occur between October and February. The results of horticultural and botanical monitoring will determine whether planting or reseeding is necessary.

## **CHAPTER 3**

### **MONITORING METHODS**

The monitoring program will consist of qualitative horticultural monitoring and quantitative vegetation monitoring.

#### **Qualitative Methods**

An experienced restoration ecologist will perform qualitative horticultural monitoring, which will focus on soil conditions (*e.g.*, moisture and fertility), container plant health and growth, seed germination rates, presence of native and nonnative plant species, any significant disease or pest problems, and any erosion problems. The restoration ecologist will develop a horticultural monitoring form (approved by the SELC project manager) which will be filled out during each site inspection. The goal of this monitoring is to proactively assess site conditions in order to address items before they become a problem.

An important feature of this monitoring is to coordinate with the maintenance contractor to exchange information, provide feedback, and agree on priority maintenance items and potential remedial measures during different stages of the enhancement work. As a guideline, the restoration ecologist will perform horticultural inspections of the enhancement sites on average monthly during year one, bimonthly during years 2 and 3, and quarterly during years 4 and 5.

During the qualitative surveys the restoration ecologist will (1) visually estimate composition and overall cover, (2) document (by species and strata) evidence of natural recruitment, and (3) estimate container plant and cutting mortality and survivorship. The restoration ecologist will identify potential soil erosion, flood damage, vandalism, weeds, and pest problems. Plant and irrigation maintenance needs will be recorded on standard maintenance checklists.

#### **Quantitative Methods**

Quantitative botanical monitoring may consist of container plant survival counts (where applicable), belt-transects, quadrats, and/or Relevé sampling methods. Container plant survival counts, if applicable, will be performed once a year in the summer, so any necessary replacement planting can be subsequently organized and implemented in the fall and winter. All container plants will be inspected and a list of dead plants will be provided to the contractor and SELC project manager. Based on a determination by the restoration ecologist, dead container plants do not need replacement if adjacent volunteer native plants (within approximately 2 feet) are providing equivalent biological value.

The intention of this monitoring method is to sample approximately 10 percent of the study area. This plan proposes the use of belt-transects of 30 by 5 meters (m) to collect data to determine the presence and absolute cover (from which relative cover can be calculated) of native and

nonnative species. In individual enhancement areas that are less than 30 meters in length or width, shorter transects will be used as appropriate.

The restoration ecologist and SELC project manager will determine the number and location of transects necessary to obtain a vegetation sample that provides good spatial coverage and unbiased samples of all enhancement areas and habitats; however, stratified random sampling is recommended. Each permanent transect must be identified on a map, staked in the field, and photographed, in order to reestablish transects should the stakes be removed. During quantitative monitoring, the restoration ecologist will record percent cover of vegetation by species and strata along each belt transect.

Transect data will be collected annually in the early summer. This monitoring should be timed to occur so that the majority of the year's annual plants are still present.

### **Photographic Documentation**

Progress of the enhancement areas will be documented with photographs. Permanent photographic viewpoints will be established (approximately one per acre). Photographs from the same viewpoints will be taken each year in the early summer.

High-resolution, color or infrared aerial photography could also be used to document enhancement progress. Infrared aerial photographs can help distinguish between nonnative (*e.g.*, pampas grass and acacia) and native species. Aerial photographs can also help track canopy growth and coverage over time. If possible, aerial photographs should be taken before and after exotics removal and then again at the end of the 5-year maintenance and monitoring program.

### **Annual Reports**

The restoration ecologist will prepare annual monitoring reports that will include horticultural and botanical monitoring results, photographic documentation, an assessment of enhancement progress relative to performance standards, and a review of maintenance activities and any remedial measures (*e.g.*, supplemental planting) undertaken during the year.

**CHAPTER 4**  
**PERFORMANCE STANDARDS AND REMEDIAL MEASURES**

Performance standards are provided to ensure the enhancement areas achieve desirable native habitat characteristics within 5 years. The performance standards are based on the composition of native habitat in the project vicinity, experience on similar projects, and reasonable expectations regarding the condition of enhanced habitats after 5 years. Attainment of the desired plant composition and cover is expected to result in significant improvement in habitat functions on-site. Yearly performance standards are also provided as milestones to determine whether the enhancement is on an adequate trajectory and whether planting and/or seeding, or other remedial measures are necessary to meet final performance standards. A combination of horticultural and botanical monitoring results will determine whether performance standards are being met and what, if any, remedial measures need to be implemented to meet the final performance standards. Performance standards and potential remedial measures are presented in Table 5. Based on monitoring results, the restoration ecologist and SELC project manager will determine when performance standards have been achieved during the milestone periods.

Depending on the condition of a particular enhancement area, a remedial measure or a combination of measures will be implemented. Appropriate measures will be determined by the restoration ecologist in consultation with the maintenance contractor and the SELC project manager.

**Table 5**  
**Performance Standards and Potential Remedial Measures**

<b>Milestone</b>	<b>Performance Standards<sup>1</sup></b>	<b>Remedial Measures</b>
Initial Exotics Removal and Seed Installation	All target perennial exotics removed or killed in place; Areas free of debris and decompacted as necessary; No erosion potential or trash	Control remaining perennial exotics; Remove debris and decompact soil; Repair erosion and/or remove trash
90-Day Maintenance Period	All target exotics removed or killed in place; Areas free of debris and decompacted; No erosion or trash	Control remaining perennial exotics; Remove debris and decompact soil; Repair erosion and/or remove trash

Table 5 continued...

Milestone	Performance Standards <sup>1</sup>	Remedial Measures
Year 1	Control of all target exotics and overall nonnative plant cover under 15%; Total native cover in exotics removal areas of 10%; No erosion or trash	Intensify exotics and weed control; Repair erosion and/or remove trash
Year 2	Control of all target exotics and overall nonnative plant cover under 10%; Total native cover in exotics removal areas of 25%; No erosion or trash	Intensify exotics and weed control; If necessary, plant and/or apply seed; If necessary, provide or improve irrigation methods; Repair erosion and/or remove trash
Year 3	Control of all target exotics and overall nonnative plant cover of under 10%; Germination of 50% of seeded species in CSS mix where applied; Total native cover (including volunteers) of 40%; No erosion or trash	Same as above, as necessary
Year 4	Control of all target exotics and absolute nonnative plant cover not to exceed 10%; Total absolute native cover (including volunteers) of 55%; No erosion or trash	Same as above, as necessary (except no irrigation)
Year 5	Control of all target exotics and absolute nonnative cover not to exceed 10%; Total absolute native cover of 75 % (including volunteers); No erosion or trash	Same as above, as necessary (except no irrigation)

<sup>1</sup> Based on horticultural and botanical monitoring results and photographic documentation, the restoration ecologist and SELC project manager will determine when performance standards have been achieved.

**CHAPTER 5**  
**LONG-TERM MANAGEMENT**

Once the scheduled 5-year post installation maintenance and monitoring program is completed and discontinued, SELC will no longer be obligated to maintain or monitor the project site. The land is under the management responsibilities of the County of San Diego Parks and Recreation Department. Long-term management tasks are expected to include qualitative monitoring of native and nonnative plants, wildlife use, vandalism or trash problems; the continuing removal of nonnative vegetation and supplemental native planting as necessary; and public education in the form of signage, site tours, and volunteer work events.

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