

# Upper Arroyo Seco Habitat Enhancement Plan

Pasadena, Los Angeles County, California

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August 2019

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## 1.0 INTRODUCTION

This Upper Arroyo Seco Habitat Enhancement Plan (HEP) has been prepared to support the City of Pasadena's goal of improving habitat functions and values in City-owned open space within the upper watershed of the Arroyo Seco. Habitat enhancement (i.e., improving natural areas that already contain a component of native vegetation) through non-native vegetation removal, and potentially including the installation of native plants/cuttings/seeds or other natural features, can achieve the following goals: (1) facilitate the replacement of non-native plant species with native plant species (that are more beneficial for wildlife species); (2) remove sources of seed of invasive/non-native plant species, to reduce future infestations; (3) remove weed-infestations that pose a fire risk (e.g., fields of Russian thistle (*Salsola* sp.); and (4) improve landscape aesthetics by removing unsightly build-up of dead, weedy brush. Some robust, noxious weeds such as giant reed (*Arundo donax*) and salt cedar (*Tamarix* spp.), also restrict pedestrian and visual access for inspection, operations and maintenance of public areas/infrastructure, deplete groundwater supplies, and even render soils unproductive for native plant establishment. Native habitat enhancement involving the removal of exotic species would be expected to reduce the amount of water required for the overall landscape. Generally, native species have lower water requirements than those of exotics and would therefore increase the available water supply for groundwater infiltration or other habitats in the area.

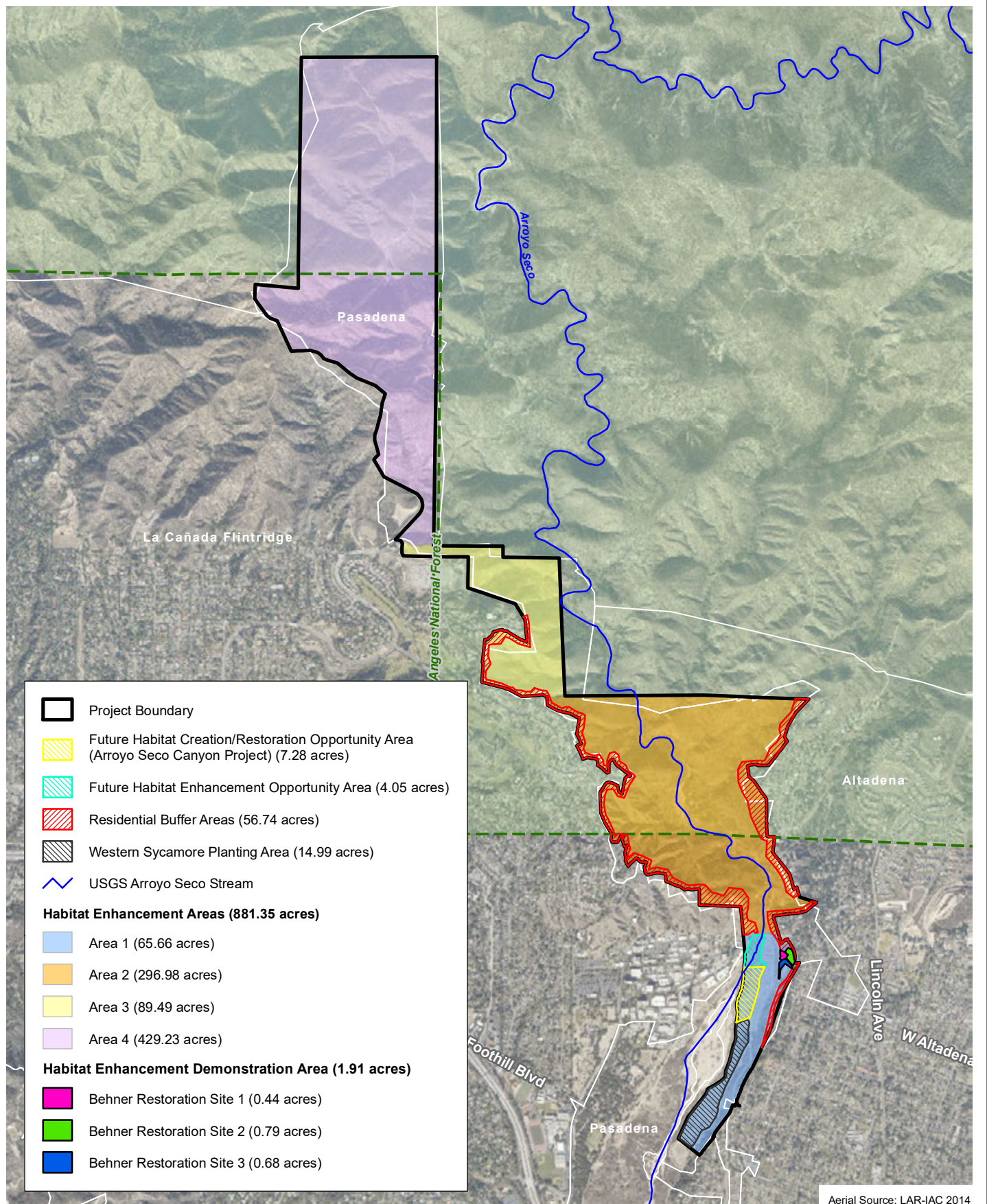
Provided below is a discussion of the goals of the program; the relevant plans, policies, and regulations; a physical description of the Project site; the ecological context of the proposed work activities, the environmental constraints to plan implementation (e.g., sensitive biological resources), a discussion of invasive/non-native vegetation removal tasks, and native plant and seed installation. The HEP also includes an appendix with detailed specifications for the various habitat enhancement tasks that were identified during the preliminary literature review and analysis phase, baseline field studies, and coordination with City personnel, to support the City's potential preparation of public bid solicitations for select restoration contracting, plant/seed procurement (vendors), and other services.

Implementation of the HEP will primarily consist of the removal of invasive/non-native vegetation from the Project site. The program may also include (a) limited 'active' habitat enhancement tasks, such as the installation of native plants and/or cuttings, and the application of native seed mixes; and (b) potential trail improvements (including natural barriers to protect sensitive habitat areas from unwanted off-trail uses, and to deter entry to unsafe areas), and the installation of signage and other interpretive features to educate the public about the natural resources of the Arroyo Seco watershed. These activities will be performed in perpetuity, or for a duration to be determined by future City plans (e.g., some proposed activities may be used for habitat mitigation requirements for City projects in the Arroyo Seco).

### 1.1 PROJECT LOCATION

The Project site encompasses large portions of the upper watershed of Arroyo Seco Canyon on the southern/coastal slope of the San Gabriel Mountains, in the City of Pasadena, in the south-central section of Los Angeles County (Exhibit 1). This Canyon represents one of the largest subwatersheds in the area, and it drains a substantial land area in the Angeles National Forest (ANF) north of the Project site. The Canyon has a general north-south alignment with moderate-to steep slopes and a relatively narrow floodplain adjacent to the Arroyo Seco watercourse. Chaparral and coastal sage scrub/sumac scrub are the dominant vegetation types on these steep slopes, although there are patches of other woodland/scrub vegetation types. A perennial stream with a pool and riffles meanders through the canyon bottom and supports a dense riparian woodland before exiting the Canyon and crossing alluvial flats towards Devil's Gate Dam.

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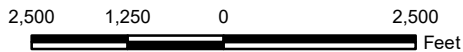


Aerial Source: LAR-IAC 2014

# Habitat Enhancement Areas

# Exhibit 1

Upper Arroyo Seco Habitat Enhancement Plan



Habitat enhancement activities are proposed to occur throughout the Project site. The Project consists of a total of four proposed work areas (generally named for typical features): Area 1 – ‘Spreading Grounds’ (66 acres); Area 2 – ‘Riparian Corridor’ (297 acres); Area 3 – ‘East of Substation’ (90 acres); and Area 4 – ‘Northern Mountain Slopes’ (430 acres). These 4 contiguous work areas are accessible via the Gabrielino Trail (which serves as a recreational trail as well as a vehicular access road to most of the Canyon for the City of Pasadena and the U.S. Forest Service (USFS), State Route 2 (Angeles Forest Highway), and other service or recreational roads/trails. Land uses in the surrounding area include flood control, industrial, residential developments, transportation, recreation, education, and open space.

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## **2.0 RELEVANT PLANS, POLICIES, AND REGULATIONS**

A literature review identified a number of other area plans with overlap into the upper watershed of the Arroyo Seco. Each of these plans included elements related to biological conservation in the area and were generally consistent with goals of the Upper Arroyo Seco HEP as outlined below.

### **2.1 HAHAMONGNA WATERSHED PARK MASTER PLAN**

- a. The City of Pasadena developed the Hahamongna Watershed Park (HWP) Master Plan as one of four of the Arroyo Seco Master Plans in 2003 (City of Pasadena 2003a). The HWP Master Plan reflects the community's vision for open space along the Arroyo Seco that extends from Devil's Gate Dam north into the Arroyo Seco Canyon and follows the Arroyo Seco's Guiding Principle "To balance and integrate the interrelated issues of water resources, recreation, natural resource preservation and restoration, and flood management in the Arroyo Seco." Specific to the Hahamongna Watershed Park is the goal to "preserve, restore, and enhance the native habitats," which is proposed to be done by, "Restore, enhance, and reestablish the historical native plant communities of the Arroyo Seco."
- b. The HWP Master Plan identifies general improvements to existing plant communities as well as 11 sites for restoration (See Exhibit 3-6 of HWP MP). Two of the sites overlap the HEP project boundaries: a stream zone in Area 1 below the JPL bridge, and an area around the spreading basins. Neither of the projects have been completed to date.

### **2.2 ARROYO SECO WATERSHED MANAGEMENT AND RESTORATION PLAN**

- a. The California State Water Resources Control Board (SWRCB) developed the Arroyo Seco Watershed Management and Restoration Plan, prepared by North East Trees, in 2006. Its purpose is to develop a plan to manage and restore water quality and habitat in the Arroyo Seco Watershed. The outcome of this effort is a series of recommended and clearly prioritized projects. These projects have been partially implemented with the recent habitat restoration project initiated by the City of Pasadena in the Oak Grove Area of Hahamongna Watershed Park. Other plan efforts are ongoing..
- b. The plan proposed three watershed-wide projects that overlap with the Upper Arroyo Seco HEP Project boundaries, including Arroyo Seco Stream Restoration (WW-1), Mountains Tributary restoration and protection (AL/ANF-1), and Hahamongna Watershed Park Habitat Restoration and BMP Implementation (P 3). This plan also proposes lower priority projects that overlap, including Upper Arroyo Seco Stream Protection and Restoration (AL-7/ANF-1).

### **2.3 ANGELES NATIONAL FOREST LAND MANAGEMENT PLAN**

- a. The United States Department of Agriculture - Forest Service (USDA-FS) prepared the Angeles National Forest Land Management Plan (ANFLMP) in 2005. Its purpose is to provide strategic direction and program emphasis objectives that are expected to result in the sustainability (social, economic, and ecological) of the national forest and, over the long-term, the maintenance of a healthy forest. This effort is ongoing throughout the ANF although no efforts specific to the Upper Arroyo Seco have been reported.



- b. The ANFLMP includes a section about the ANF Front County, which overlaps with the upper Arroyo Seco HEP project boundaries. This section of the ANFLMP states that the desired condition for the Front County is, “Habitat conditions for threatened, endangered, proposed, candidate and sensitive species are improving over time. Exotic species are reduced and controlled over time.” The USFS is involved with environmental education; conservation stewardship programs; regional planning for wildlife linkages; and ongoing maintenance of urban and national forest infrastructure facilities consistent with the natural setting.

## 2.4 USDA-FS WEED MANAGEMENT STRATEGY

- a. The USDA-FS prepared the Invasive Species Management Strategy in 2013, with a subsequent Appendix titled Southern California Weed Management Strategy (USDA 2019). Its purpose is to 1) increase the understanding and awareness of noxious weeds and the adverse effects they have on wildland ecosystems; 2) develop and promote implementation of a consistent integrated pest management approach; and 3) develop strong partnerships and cooperation with private landowners, county governments, State and federal agencies, extension services, universities, and the research community for a consolidated and united approach to managing invasive species. While the USFS jurisdiction is limited to the ANF within the HEP vicinity, the plan clearly recognizes the importance of adjacent land management for successful invasive species control. This effort is ongoing.
- b. Plan excerpts and components relative to the Upper Arroyo Seco HEP area include the following:
  - 1. “The spread of invasive weeds ignores all boundaries. The only way that the national forests of southern California can succeed in the control and prevention of noxious weeds is through coordination and cooperation with neighbors and partners.”
  - 2. Objective 1. “Use Weed Management Areas (WMA) to consolidate and coordinate weed control across jurisdictional boundaries.”
  - 3. Proposed Actions: “Use WMAs to consolidate and coordinate weed control across jurisdictional boundaries.”
  - 4. ANF-Arroyo-Specific Proposed Action: “Coordinate with Los Angeles WMA to continue controlling and/or removing...German and English ivy, vinca, and Spanish broom in...Arroyo Seco.”

## 2.5 INTEGRATED REGIONAL WATER MANAGEMENT PLAN

- a. The Los Angeles County Flood Control District prepared the Integrated Regional Water Management Plan in 2013, with a further update in 2015 (CWE 2015) by multiple agencies specific to the Los Angeles River Upper Reaches. This area includes the Arroyo Seco. Its purpose is as a comprehensive stormwater management plan intended to allow optimization of the extremely limited stormwater and financial resources of the participating Permittees. Plans, development, and rehabilitation efforts are ongoing throughout the upper Los Angeles River.
- b. The plan’s Upper LA River Subregion section states: “There is a large northern upland open space watershed that drains into areas with a high potential to derive aquatic habitat benefits”. The area referred to includes the upper Arroyo Seco watershed.

- c. An additional example of a plan component specifically related to the Upper Arroyo Seco can be discerned from the Plan’s text below regarding the groundwater basin in the project area: :
  - 1. “Intra-Regional Raymond Basin Water Supply and Quality:”
    - a. “Raymond Basin to benefit through stormwater capture.”
    - b. “This area also has been identified as a high priority drainage for achieving water quality benefits and therefore multiple-benefits project opportunities. Partnerships between the City of Pasadena, other Raymond Basin pumpers, Los Angeles County Sanitation Districts and Los Angeles County Flood Control District could result in very beneficial integrated projects.”

**2.6 ONE ARROYO REPORT**

- a. The Arroyo Advisory Group (AAG) was formed to assist the City of Pasadena in developing a cohesive vision for the Arroyo Seco. Their August 2018 One Arroyo Report (AAG 2018) defines this vision and includes:
  - 1. Guiding Principles
    - i. “1. The Arroyo Seco will be respected as a natural environment, and the activities, maintenance and improvements within it will, to the fullest extent practical, preserve the natural character of the setting.”
    - ii. “3. Natural elements, including streams, trees, flowers, grasses, habitats and natural topography will be restored and preserved to the fullest extent practicable.”
  - 2. “A volunteer program was also considered to aid in addressing the ongoing maintenance challenges and is recommended as a future supplement to the public and private funding sources recommended as a part of this report.”

Implementation of the One Arroyo Report recommendations are on-going.

**2.7 ARROYOS & FOOTHILLS CONSERVANCY**

- a. The Arroyos & Foothills Conservancy (AFC) is a nonprofit organization that preserves land and restores habitat in and around the San Gabriel and Crescenta Valleys, thereby protecting natural areas for birds and wildlife and providing access and educational experiences for the community (AFC 2019).
- b. The AFC has identified opportunities to create passageways for wildlife to move between areas of natural habitat, including the arroyo and surrounding mountains, so they can mix with the wider population of their species and hunt and forage in larger landscapes.
- c. The AFC has listed one of its goals as establishing and preserving a wildlife corridor between Hahamongna to Tujunga and has completed a study of this area to determine its ecological value. Ongoing efforts are geared towards creating a GIS database for this area; purchasing parcels to complete the conservation of the corridor in conjunction with the National Park Service; and furthering public education about the area.

## 2.8 REGULATORY FRAMEWORK

Federal, State, and local biological resource regulations applicable to the Project area and potential habitat enhancement activities are outlined below. A discussion of the applicability of these regulations and the approach to compliance are provided in Section 6 below.

### 2.8.1 FEDERAL

#### **Federal Endangered Species Act**

The Federal Endangered Species Act of 1973 (FESA, 16 *United States Code* [USC] Section 153 et seq.) protects plants and animals that are listed by the federal government as “Endangered” or “Threatened”. Protection of listed plants and animals is provided by enforcing Sections 7 and 9 of FESA. A federally listed species is protected from unauthorized “take” pursuant to Section 9. “Take”, as defined by the FESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or to attempt to engage in any such conduct”. All persons are presently prohibited from taking a federally listed species unless and until (1) the appropriate Section 10(a) permit has been issued by the USFWS or (2) an Incidental Take Statement is obtained as a result of formal consultation between a federal agency and the USFWS pursuant to Section 7 of the FESA and the implementing regulations that pertain to it (50 *Code of Federal Regulations* [CFR] Section 402). It should be noted that any proposed Project must have a federal nexus in order to request “take” pursuant to Section 7. If there is no federal nexus and there are impacts to federally listed species, preparation of a Habitat Conservation Plan will likely be required pursuant to FESA section 10. “Person” is defined in the FESA as “an individual, corporation, partnership, trust, association, or any private entity; any officer, employee, agent, department or instrument of the federal government; any State, Municipality, or political subdivision of the state; or any other entity subject to the jurisdiction of the United States”. The Project Applicant is a “person” for purposes of the FESA.

#### **Section 404 and 401 of the Clean Water Act of 1972**

Section 404 of the Clean Water Act (CWA, 33 USC 1251 et seq.) regulates the discharge of dredged or filled material into “waters of the U.S.”, including wetlands. “Waters of the U.S.” include navigable coastal and inland waters, lakes, rivers, streams, and their tributaries; interstate waters and their tributaries; wetlands adjacent to such waters; intermittent streams; and other waters that could affect interstate commerce. The U.S. Army Corps of Engineers (USACE) is the designated regulatory agency responsible for administering the 404 permit program and for making jurisdictional determinations. This permitting authority applies to all “waters of the U.S.” where project activities would have the effect of (1) replacing any portion of “waters of the U.S.” with dry land (fill) or (2) changing the bottom elevation of any portion of “waters of the U.S.” (dredge). Fill materials could include sand, rock, clay, construction debris, wood chips, and materials used to create any structure or infrastructure in “waters of the U.S.”. Dredge and fill activities are typically associated with development projects; water-resource related projects; infrastructure development and wetland conversion to farming; forestry; and urban development.

Under Section 401 of the CWA, an activity requiring a USACE Section 404 permit must obtain a State Water Quality Certification (or waiver thereof) to ensure that the activity will not violate established State water quality standards. The U.S. Environmental Protection Agency (USEPA) is the federal regulatory agency responsible for implementing the CWA. However, under section 401 of the CWA, the EPA had delegated authority to implement section 401 of the CWA to the States. In California, that authority is given to the State Water Resources Control Board (SWRCB), in conjunction with the nine California Regional Water Quality Control Boards (RWQCBs), has been delegated the responsibility for administering the Section 401 water quality certification program.

The RWQCB is the primary agency responsible for protecting water quality in California through the regulation of discharges to surface waters under the CWA and the California Porter-Cologne Water Quality Control Act. The RWQCB's jurisdiction extends to all "waters of the State" and to all "waters of the U.S.", including wetlands (isolated and non-isolated). Section 401 requires the RWQCB to provide "certification that there is reasonable assurance that an activity which may result in the discharge to 'waters of the U.S.' and "waters of the State" will not violate water quality standards". Water Quality Certification must be based on a finding that the proposed discharge will comply with water quality standards, which contain numeric and narrative objectives that can be found in each of the nine Regional Boards' Basin Plans.

### **Migratory Bird Treaty Act of 1918**

The Migratory Bird Treaty Act of 1918 (MBTA), as amended in 1972 (MBTA, 16 USC 703–711), makes it unlawful, unless permitted by regulations, to "pursue; hunt; take; capture; kill; attempt to take, capture or kill; possess; offer for sale; sell; offer to purchase; purchase; deliver for shipment; ship; cause to be shipped; deliver for transportation; transport; cause to be transported; carry or cause to be carried by any means whatever; receive for shipment, transportation, or carriage; or export, at any time, or in any manner, any migratory bird...for the protection of migratory birds...or any part, nest, or egg of any such bird" (16 USC 703).

In 1972, the MBTA was amended to include protection for migratory birds of prey (e.g., raptors). The following six families of raptors that occur in North America were included in the amendment: *Accipitridae* (kites, hawks, and eagles), *Cathartidae* (New World vultures), *Falconidae* (falcons and caracaras), *Pandionidae* (ospreys), *Strigidae* (typical owls), and *Tytonidae* (barn owls). The provisions of the 1972 amendment to the MBTA protect all species and subspecies of these families.

The interpretation and approach to enforcement of the MBTA has been undergoing a shift and should be assessed for current status prior to the start of work.

### **Bald and Golden Eagle Protection Act**

The Bald and Golden Eagle Protection Act (Act) (16 USC 668) provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting—except under certain specified conditions—the taking, possession, and commerce of these two bird species. The 1972 amendments increased penalties for violating provisions of the Act and strengthened other enforcement measures. A 1978 amendment authorizes the Secretary of the Interior to permit the taking of golden eagle nests that interfere with resource development or recovery operations. A 1994 Memorandum (59 CFR 22953, April 29, 1994) from President William J. Clinton to the heads of Executive Agencies and Departments sets out the policy concerning collection and distribution of eagle feathers for Native American religious purposes.

## **2.8.2 STATE**

### **California Endangered Species Act**

Pursuant to the California Endangered Species Act (CESA, *California Fish and Game Code*, Section 2050 et seq.) and Section 2081 of the *California Fish and Game Code*, an Incidental Take Permit from the CDFW is required for projects that could result in the take of a State-listed Threatened or Endangered species. Under CESA, "take" is defined as an activity that would directly or indirectly kill an individual of a species, but the definition does not include "harm" or "harass", as FESA does. As a result, the threshold for take under the CESA is higher than that under the FESA. The application for an Incidental Take Permit under Section 2081(b) has a

number of requirements, including the preparation of a conservation plan, generally referred to as a Habitat Conservation Plan.

The State of California considers an Endangered Species to be one whose prospects of survival and reproduction are in immediate jeopardy; a Threatened Species as one present in such small numbers throughout its range that it is likely to become an Endangered Species in the near future in the absence of special protection or management; and a Rare Species as one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. The Rare Species designation applies only to California native plants. The CESA authorizes the CDFW to issue permits authorizing incidental take of Threatened and Endangered, or Rare Species. A California Species of Special Concern is an informal designation that the CDFW uses for some declining wildlife species that are not State Candidates for listing. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFW.

### **California Environmental Quality Act**

State law (*California Fish and Game Code*, Section 1802) confers upon the CDFW the trustee responsibility and authority for the public trust resource of wildlife in California. The CDFW may play various roles under the CEQA process. By State law, the CDFW has jurisdiction over the conservation, protection, and management of the wildlife, native plants, and habitat necessary to maintain biologically sustainable populations. The CDFW is responsible for consulting with CEQA lead and responsible agencies and provides the requisite biological expertise to review and comment upon environmental documents and impacts arising from project activities.

As a trustee agency, the CDFW has jurisdiction over certain resources held in trust for the people of California. Trustee agencies are generally required to be notified of CEQA documents relevant to their jurisdiction, whether or not these agencies have actual permitting authority or approval power over aspects of the underlying project (14 *California Code of Regulations* [CCR], Section 15386). The CDFW, as a trustee agency, must be notified of CEQA documents regarding projects involving fish and wildlife of the state, as well as Rare Threatened, and Endangered native plants, wildlife areas, and ecological reserves. Although the CDFW, as a trustee agency, cannot approve or disapprove a project, CEQA lead and responsible agencies are required to consult with the CDFW. The CDFW, as the trustee agency, has the authority to make recommendations regarding those resources held in trust for the people of California (*California Fish and Game Code*, Section 1802).

It should be noted that CEQA includes exemption status for some activities including habitat restoration activities which meet certain criteria. Depending upon the phasing and implementation schedule, proposed habitat enhancement activities may or may not qualify and shall be assessed prior to implementation.

### **Lake and Streambed Alteration Program**

All diversions, obstructions, or changes to the natural flow or bed, channel, or bank of any river, stream, or lake in California that support wildlife resources and/or riparian vegetation are subject to CDFW regulations, pursuant to Sections 1600 through 1616 of the *California Fish and Game Code*. Under Section 1602, it is unlawful for any person to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake designated by CDFW as waters within their jurisdiction without first notifying CDFW of such activity. Additionally, a person cannot use any material from the streambeds without first notifying the CDFW of such activity. For a project that may affect stream channels and/or riparian vegetation regulated under Sections 1600 through 1616 of the *California Fish and Game Code*, CDFW authorization is required in the form of a Streambed Alteration Agreement.

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## **Native Plant Protection Act**

The Native Plant Protection Act (*California Fish and Game Code*, Section 1900 et seq.) provides for the preservation, protection, and enhancement of Endangered, Threatened, or Rare native plants in California. These sections also allow for the adoption of regulations governing the taking, possession, propagation, transportation, exportation, importation, or sale of any Endangered or Rare native plants.

## **California Fully Protected Species**

Bird, mammal, reptile, amphibian, and fish species are defined as California Fully Protected Species in Sections 3511, 4700, 5050, and 5515 of the *California Fish and Game Code*. Fully protected animals may not be harmed, taken, or possessed.

## **Nesting Bird Protection**

Nesting birds are protected in Sections 3503, 3503.5, and 3513 of the *California Fish and Game Code*. These sections state that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by or any regulation made pursuant to this code. Section 3503.5 explicitly provides protection for all birds of prey, including their eggs and nests. Section 3513 makes it unlawful to take or possess any migratory non-game bird as designated in the MBTA.

## **Threatened and Endangered Species**

The *California Code of Regulations* (Sections 670.2 and 670.5) lists species, subspecies, and varieties of plants (Section 670.2) and animals (Section 670.5) that are designated as Threatened or Endangered (as defined by Section 2067 of the *California Fish and Game Code*) or Rare (as defined by Section 1901 of the *California Fish and Game Code*) in California.

## **California Porter-Cologne Water Quality Control Act**

Pursuant to the California Porter-Cologne Water Quality Control Act, the SWRCB and the nine RWQCBs may require permits (known as “Waste Discharge Requirements” or “WDRs”) for the fill or alteration of the “waters of the State”. The term “waters of the State” is defined as “any surface water or groundwater, including saline waters, within the boundaries of the state” (*California Water Code*, Section 13050[e]). The State and Regional Boards have interpreted their authority to require WDRs to extend to any proposal to fill or alter “waters of the State”, even if those same waters are not under USACE jurisdiction. Pursuant to this authority, the State and Regional Boards may require the submission of a “report of waste discharge” under Section 13260 of the *California Water Code*, which is treated as an application for a WDR.

### **2.8.3 LOCAL**

#### **City of Pasadena Tree Protection Ordinance**

The City of Pasadena maintains a local tree ordinance (Ord. No. 7184, § 10, 3-15-2010) which sets forth requirements for obtaining a tree removal permit for all “protected trees,” which includes trees whose trunk (or collective trunks) exceed a diameter of eight inches measured four and ½ feet above natural ground level. The following native tree species are considered protected under this ordinance: coast live oak (*Quercus agrifolia*), Engelmann oak (*Quercus englemannii*), canyon oak (*Quercus chrysolepis*), western sycamore (*Platanus racemosa*), California walnut (*Juglans californica*), scrub oak (*Quercus berberidifolia*), valley oak (*Quercus lobata*), California bay (*Umbellularia californica*), Fremont’s cottonwood (*Populus fremontii*), white

alder (*Alnus rhombifolia*), black cottonwood (*Populus trichocarpa*), arroyo willow (*Salix lasiolepis*), and California buckeye (*Aesculus californica*). In addition to these protected native trees, there are an additional 103 non-native tree species addressed by the ordinance. These non-native species are protected at various sizes. The Project site is known to contain most of the above listed species, and authorization may be required prior to any project-related activities that would trim or remove these trees.

### 3.0 **PHYSICAL SITE CONDITIONS**

Provided below is a description of existing physical (landscape) conditions in the Project area, including topography and climate.

#### 3.1 **TOPOGRAPHY**

Psomas conducted a slope analysis using Geographic Information System (GIS) software, to assess areas where pedestrian access for field studies was prohibited due to topography and safety concerns—i.e., areas with a slope factor that is steeper than 2:1. It was determined that a total of 67 percent of the Project area consists of slopes that are steeper than 2:1, as summarized in Table 1 and depicted in Exhibit 2. Habitat conditions and enhancement opportunities within these areas were determined by viewing from nearby accessible vantage points and aided with binoculars.

**TABLE 1  
SLOPE ANALYSIS SUMMARY**

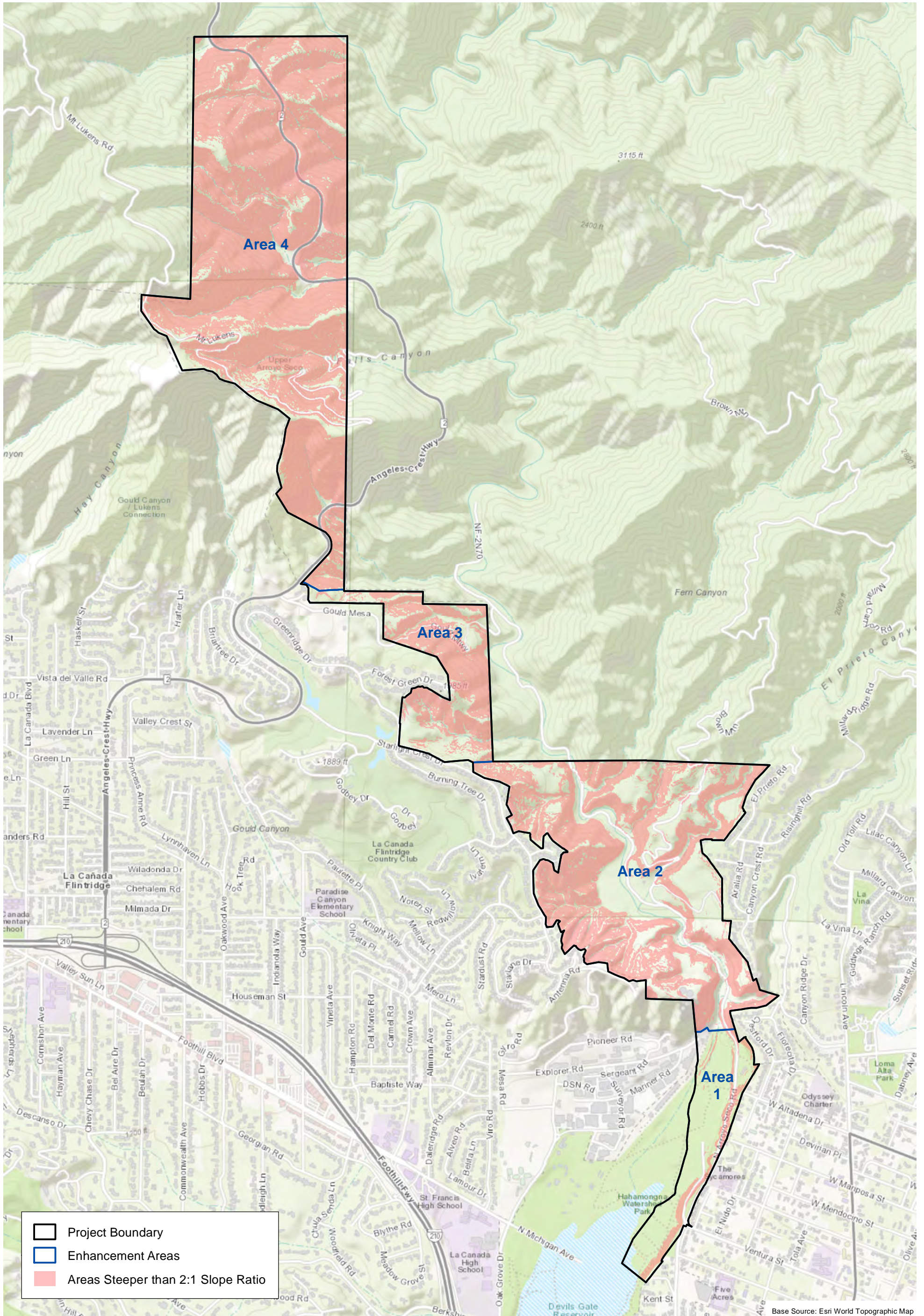
<b>Habitat Enhancement Area</b>	<b>Size (Approximate Acres)</b>	<b>Portion of Site (Percent) that is Steeper than 2:1 Slope Ratio</b>
Area 1	66	17.22
Area 2	297	55.79
Area 3	90	62.36
Area 4	430	84.10
<b>Total</b>	<b>883</b>	<b>67.37</b>

Topography in the Project site is mostly composed of steep slopes with flat areas in canyon bottoms and within the percolation basins at the south end of the Project site. On-site elevations range from approximately 1,035 to 2,673 feet above mean sea level (msl). The Arroyo Seco is a tributary of the Los Angeles River within the Upper Arroyo Seco except for the Brown Canyon debris dam, PWP headworks, and PWP diversion dam. Immediately west and south of the Project site, the Arroyo Seco spreads into a large reservoir behind Devils Gate Dam, which supports riparian scrub and woodland communities adjacent to the Project site. The concrete-lined portion of the Arroyo Seco occurs approximately 0.45 miles southeast of the Project site.

#### 3.2 **CLIMATE**

The region experiences a Mediterranean climate characterized by mild, rainy winters and hot, dry summers. The temperature is moderated by the coastal influence of the Pacific Ocean, which creates mild conditions throughout most of the year. The most distinguishing characteristic of a Mediterranean climate is its seasonal precipitation. In Southern California, precipitation is characterized by brief, intense storms between November and March. It is not unusual for a majority of the annual precipitation to fall during a few storms over a short span of time. Rainfall patterns in the region are subject to extreme variations from year to year and longer-term wet and dry cycles. The average annual rainfall for the area is approximately 16.29 inches based on 1939–2012 averages (WRCC 2012).



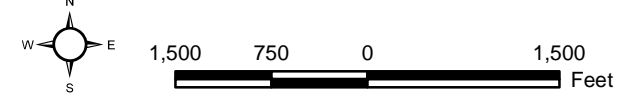


- Project Boundary
- Enhancement Areas
- Areas Steeper than 2:1 Slope Ratio

Base Source: Esri World Topographic Map

### Slope Analysis

Upper Arroyo Seco Habitat Enhancement Plan



### Exhibit 2



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## **4.0 SURVEY METHODS**

Psomas conducted a literature search to identify existing environmental documentation (e.g., the California Natural Diversity Database [CNDDDB]; and the California Native Plant Society's [CNPS's] Rare Plant records data base; California Environmental Quality Act [CEQA]/National Environmental Policy Act [NEPA] documentation; watershed management plans) related to the Upper Arroyo Seco HEP Project area, including City-owned parcels and other private and public lands within the upper watershed (e.g., Angeles National Forest). Psomas also evaluated property ownership/easement status to assess safe/legal points of access (pedestrian and/or vehicle) to City-owned lands. This included a review of the Pasadena, Mt. Wilson, Burbank, and Condor Peak USGS 7.5-minute topographic quadrangles in the California Native Plant Society's (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2018) and the CDFW's California Natural Diversity Database (CNDDDB) (CDFW 2018). In addition, the compendia of special status species published by the USFWS and CDFW were reviewed.

### **4.1 INVASIVE VEGETATION SURVEY AND MAPPING**

An invasive vegetation survey (including invasive trees, shrubs, and herbaceous annual/perennial weeds) was performed by Psomas' Certified Arborists David Hughes (International Society of Arboriculture [ISA] Certification No. WE-7752A), Trevor Bristle (ISA Certificate No. WE-10233A), Botanist Katie Gallagher, and Biologist Sarah Thomas, on February 5 and March 13, 2019. The general location and extent of invasive/non-native plant species were mapped in the field using a hand-held GPS unit. Polygons with a significant percent coverage of such plants were described and mapped, and plant species that are identified as 'invasive' by the California Invasive Plant Council (Cal-IPC) were specifically noted.

The purpose of the invasive vegetation survey was to assess the occurrence of invasive plant species in the Project area, and to map and quantify potential treatment areas for the development of detailed contractor specifications for the removal of invasive vegetation (i.e., construction bidding documents). The various habitat enhancement tasks that were identified during the preliminary literature review and analysis phase, baseline field studies, and coordination with City personnel, are described in Sections 7 and 8 below, and are also detailed in Appendix A (Specifications).

During the survey, each habitat type was also evaluated for its potential to support special status species that are known or expected to occur in the region, as well as, the potential for Project activities to adversely impact wildlife species. Incidental observations of wildlife species were recorded during the survey. Birds were identified by visual and auditory recognition. Taxonomy and nomenclature for wildlife described herein generally follows Stebbins (2012) for amphibians and reptiles, American Ornithologists' Union (2017) for birds, and Baker et al. (2003) for mammals.

## 5.0 BIOLOGICAL RESOURCES

This section describes the biological resources that occur within the Project site. The following topics are discussed below: vegetation, wildlife, special status vegetation types; and special status plant and wildlife species.

### 5.1 VEGETATION

Most of the upper portions of the Project site are in good condition due to lack of ground disturbance and support extensive tracts of contiguous native vegetation. General vegetation communities include chaparral, scrub, and woodland communities. These groups are described with more detail below.

The Arroyo Seco canyon in general includes streambed within a riparian corridor which stretches for many miles above and below the Project site. Most of the Arroyo Seco streambed consists of pools and riffles amid granite boulders. A few exceptions occur where the rocky substrate changes to short stretches of course sand. Surface water flows perennially in all but a few locations and supports riparian woodlands on benches above the main channel. Riparian vegetation within the Project site is consistent with the other large creeks which drain the southern slopes of the San Gabriel Mountains. Although there are occasional patches of other plant communities, alder riparian forest is the dominant plant community occurring nearly throughout the drainage. This plant community is dominated by mature white alders reaching heights of 80 feet and forming a closed canopy. Other less common species include coast live oak (*Quercus agrifolia*), canyon oak, California sycamore, big leafed maple (*Acer macrophyllum*), and black cottonwood (*Populus balsamifera* ssp. *trichocarpa*). The understory of this plant community is sparse and consists of species such as willow, poison oak, and California rose (*Rosa californica*). The alder forest occurs on benches immediately adjacent to the active channel and forms a continuous canopy across the active channel as well. This plant community type accounts for approximately 95 percent of the riparian corridor within the upper Arroyo Seco drainage.

Due to the steep rocky slopes which contain the drainage, the riparian corridor is often limited to just the alder woodland. However, in several areas, the alder woodland gives way to oak woodland on higher benches. Oak woodlands within the survey area are dominated by coast live oak with less frequent occurrences of California sycamore, big leaf maple, canyon oak, black cottonwood, and California bay. The understory within the oak woodlands is more well developed and includes dense patches of species such as poison oak, California blackberry, and California rose.

Woodland communities occurring specifically within the Project site generally include upland woodland types occurring on the drier canyon slopes, and riparian woodland occurring in the wetted riparian zone. Upland woodland types found in the Project site consist mostly of coast live oak woodland that is dominated by coast live oak. Coast live oak woodland is found mainly in the east and north facing slopes. The understory is mostly comprised of oak leaf litter and western poison oak (*Toxicodendron diversilobum*). Riparian woodland vegetation occurring within and along the Arroyo Seco channel within the Project site consists mainly of California sycamore woodland, white alder/California sycamore woodland, California sycamore/coast live oak woodland, and arroyo willow thickets. California sycamore woodland is dominated by mature California sycamore trees (*Platanus racemosa*). Understory species include western ragweed (*Ambrosia psilostachya*), mugwort (*Artemisia douglasiana*), and California everlasting (*Pseudognaphalium californicum*). White alder/sycamore woodland is dominated by a mix of mature trees, including California sycamore and white alder (*Alnus rhombifolia*). Understory species include crofton weed (*Ageratina adenophora*), mule fat (*Baccharis salicifolia*), California blackberry (*Rubus ursinus*), Douglas' nightshade (*Solanum douglasii*), and western poison oak.

California sycamore/coast live oak woodland is dominated by large coast live oak and California sycamore trees. Other species present include annual bur-sage (*Ambrosia acanthicarpa*), mugwort, and phacelia (*Phacelia* spp.). Arroyo willow thickets are dominated by arroyo willow. Understory species include mugwort, mule fat, willow-herb (*Epilobium ciliatum*), rush (*Juncus* sp.), broad-leaved cattail (*Typha latifolia*), and hoary nettle (*Urtica dioica* ssp. *holosericea*).

Various types of scrub and chaparral communities occur mostly on the drier north and west facing slopes. Scrub types include California sagebrush/California buckwheat scrub, California buckwheat scrub, and laurel sumac scrub. Examples of chaparral types include scrub oak chaparral, and chamise chaparral. California sagebrush/California buckwheat scrub is dominated by California sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*) intermixed with a diversity of shrub species. Other common shrub species include black sage (*Salvia mellifera*), bush monkeyflower (*Mimulus aurantiacus*), white sage (*Salvia apiana*), Our Lord's candle (*Hesperoyucca whipplei*), deerweed (*Acmispon glaber*), and California brittlebush (*Encelia californica*). California buckwheat scrub is dominated by California buckwheat, but contains smaller amounts of other sage scrub species such as California sagebrush, black sage, and white sage. Laurel sumac scrub is dominated by laurel sumac (*Malosma laurina*) and includes species such as chamise (*Adenostoma fasciculata*), toyon, (*Heteromeles arbutifolia*), southern honeysuckle (*Lonicera subspicata*), sugar bush (*Rhus ovata*), California sagebrush, California buckwheat, black sage, and white sage. Scrub oak chaparral consists primarily of scrub oak (*Quercus berberidifolia*) trees with a diverse mix of species in the understory. Species present in the understory commonly include laurel sumac, blue elderberry (*Sambucus nigra* ssp. *caerulea*), and toyon. Chamise chaparral is dominated by chamise and includes species present in other chaparral and scrub habitats such as black sage, white sage, bush monkey flower, and laurel sumac.

## 5.2 WILDLIFE

The Project site is comprised primarily of native habitats and provides suitable habitat for a wide variety of wildlife species. The Arroyo Seco is a perennial creek and provides potential habitat for native fish species, although they appear to have been extirpated. Although rainbow trout (*Onocorhynchus mykiss*) have occurred, the creek is known to have been stocked with different strains of this species by the CDFW making any potential remnant populations unlikely to be of native origin. This and other non-native species such as the American bullfrog (*Lithobates catesbeiana*) which was detected during surveys, can negatively affect native species that have adapted to the natural conditions of the region.

Suitable habitat for amphibians is present throughout most of the drainages in the study area. Native amphibian species recently observed include the western toad (*Anaxyrus boreas*), California chorus frog (*Pseudacris cadaverina*), and Pacific chorus frog (*Pseudacris regilla*). As discussed above for fish, the non-native American bullfrog was also observed and can negatively affect native amphibian species populations.

The native habitats of the study area are expected to support a relatively wide variety of reptile species. The following common reptile species were observed in the study area: western fence lizard (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), western whiptail (*Aspidoscelis tigris*), southern alligator lizard (*Elgaria multicarinata*), gopher snake (*Pituophis catenifer*), and western rattlesnake (*Crotalus oreganus*).

A variety of bird species are expected to be resident in the study area. These resident bird species use habitats in the Project site throughout the year while other species are present only during certain seasons. For example, the white-crowned sparrow (*Zonotrichia leucophrys*) was observed in the study area but migrates to more northerly regions during spring and, as a result, will be absent from the study area during the summer season. The following bird species were observed

during the surveys and are expected to be residents: California quail (*Callipepla californica*), killdeer (*Charadrius vociferus*), band-tailed pigeon (*Patagioenas fasciata*), mourning dove (*Zenaida macroura*), Anna's hummingbird (*Calypte anna*), acorn woodpecker (*Melanerpes formicivorus*), Nuttall's woodpecker (*Picoides nuttallii*), black phoebe (*Sayornis nigricans*), Hutton's vireo (*Vireo huttoni*), Steller's jay (*Cyanocitta stelleri*), western scrub-jay (*Aphelocoma californica*), American crow (*Corvus brachyrhynchos*), common raven (*Corvus corax*), oak titmouse (*Baeolophus inornatus*), bushtit (*Psaltriparus minimus*), house wren (*Troglodytes aedon*), Bewick's wren (*Thryomanes bewickii*), wrentit (*Chamaea fasciata*), northern mockingbird (*Mimus polyglottos*), California thrasher (*Toxostoma redivivum*), spotted towhee (*Pipilo [Pipilo] maculatus*), California towhee (*Melospiza crissalis*), song sparrow (*Melospiza melodia*), house finch (*Carpodacus mexicanus*), and lesser goldfinch (*Spinus [Carduelis] psaltria*).

Migratory bird species observed during the surveys that are expected to be present during the summer include the black-chinned hummingbird (*Archilochus alexandri*), western wood-pewee (*Contopus sordidulus*), Pacific-slope flycatcher (*Empidonax difficilis*), ash-throated flycatcher (*Myiarchus cinerascens*), warbling vireo (*Vireo gilvus*), northern rough-winged swallow (*Stelgidopteryx serripennis*), cliff swallow (*Petrochelidon pyrrhonota*), barn swallow (*Hirundo rustica*), yellow warbler (*Setophaga [Dendroica] petechia*), black-headed grosbeak (*Pheucticus melanocephalus*), brown-headed cowbird (*Molothrus ater*), hooded oriole (*Icterus cucullatus*), and Bullock's oriole (*Icterus bullockii*). Wintering bird species that would be expected to occur include the ruby-crowned kinglet (*Regulus calendula*), hermit thrush (*Catharus guttatus*), cedar waxwing (*Bombycilla cedrorum*), yellow-rumped warbler (*Setophaga [Dendroica] coronata*), Townsend's warbler (*Setophaga [Dendroica] townsendi*), and white-crowned sparrow.

Raptors (birds of prey) observed in the study area include Cooper's hawk (*Accipiter cooperii*), red-shouldered hawk (*Buteo lineatus*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), and great horned owl (*Bubo virginianus*). The turkey vulture (*Cathartes aura*), a scavenger, was also observed in the study area.

The native habitats of the study area are expected to support a relatively wide variety of mammal species. Small ground dwelling mammals observed during the 2013 surveys included desert cottontail (*Sylvilagus auduboni*), California ground squirrel (*Otospermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), and Bryant's woodrat (*Neotoma bryanti*). Medium to large-sized mammals observed in the study area included coyote (*Canis latrans*), gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), raccoon (*Procyon lotor*), mule deer (*Odocoileus hemionus*), and bobcat (*Lynx rufus*).

Bats occur throughout most of Southern California and may use any portion of the Project site as foraging and roosting habitat. Most of the bats that could potentially occur in the Project site are inactive during the winter and either hibernate or migrate, depending on the species. Several bat species may occur in the Project site including the western bonneted bat (*Eumops perotis*), hoary bat (*Aeorestes cinereus*), big brown bat (*Eptesicus fuscus*), California myotis (*Myotis californicus*), western pipistrelle (*Pipistrellus hesperus*), and Brazilian free-tailed bat (*Tadarida brasiliensis*). Bats may roost in the rocky outcroppings along the Arroyo Seco or in large oak or sycamore trees in the study area.

## 6.0 ENVIRONMENTAL RESOURCE PROTECTION

umber of biological resources within the Project site are protected to some degree by City, State, and/or federal regulations, as listed in Section 2.8. This section discusses these in general to ensure that implementation of habitat enhancement activities avoids or minimizes impacts to protected resources.

### 6.1 SPECIAL STATUS RESOURCES

Special Status biological resources include plant and wildlife species that have been afforded special status by federal and State resource agencies, as well as private conservation organizations. In general, the principal reason an individual taxon (i.e., species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss. In addition, special status biological resources include vegetation types and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. These special status biological resources have been defined by federal, State, and local government conservation programs. Sources used to determine the special status of biological resources are listed below.

- **Habitats** – the CNDDDB (CDFW 2019a) and the List of Vegetation Alliances and Associations, Vegetation Classification and Mapping Program (CDFG 2010).
- **Plants** – the Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS 2019); the CNDDDB (CDFW 2019a); and the CDFW’s List of Special Vascular Plants, Bryophytes, and Lichens (CDFW 2019c).
- **Wildlife** – the CNDDDB (CDFW 2019a); various USFWS Federal Register notices regarding listing status of wildlife species; and the CDFG’s List of Special Animals (CDFG 2019).

A federally **Endangered** species is one facing extinction throughout all or a significant portion of its geographic range. A federally **Threatened** species is one likely to become Endangered within the foreseeable future throughout all or a significant portion of its range. The presence of any federally Threatened or Endangered species within a project impact area generally imposes severe constraints on development, particularly if an action would result in “take” of the species or its habitat. The FESA defines the term “take” as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct. Harm, in this sense, can include any disturbance of habitats used by the species during any portion of its life history.

**Proposed** species or **Candidate** species are those officially proposed by the USFWS for addition to the federal Threatened and Endangered species list. Because proposed species may soon be listed as Threatened or Endangered, the presence of a Proposed or Candidate species may impose constraints on development if they are listed prior to an action, particularly if the action would result in “take” of the species or its habitat.

The State of California considers an **Endangered** species as one whose prospects of survival and reproduction are in immediate jeopardy; a **Threatened** species as one present in such small numbers throughout its range that it is likely to become an Endangered species in the near future in the absence of special protection or management; and a **Rare** species as one present in such small numbers throughout its range that it may become Endangered if its present environment worsens. The Rare species designation applies only to California native plants; these species are treated as State-listed species. State-listed Threatened and Endangered species are fully protected against take unless an Incidental Take Permit is obtained from the resource agencies. The presence of any State-listed Rare, Threatened, or Endangered species generally imposes constraints on proposed actions, particularly if the action would result in “take” of the species or its habitat.

**California Species of Special Concern** is an informal designation used by the CDFW for some declining wildlife species that are not State Candidates. This designation does not provide legal protection, but signifies that these species are recognized as special status by the CDFW.

Species that are **California Fully Protected** and **Protected** include those protected by special legislation for various reasons, such as the mountain lion (*Puma concolor*) and white tailed kite (*Elanus leucurus*). Fully Protected species may not be taken or possessed at any time. California Protected species include those species that may not be taken or possessed at any time except under special permit from the CDFW issued pursuant to the *California Code of Regulations* (Title 14, Sections 650, 670.7) or Section 2081 of the *California Fish and Game Code*.

The California Rare Plant Rank (CRPR), formerly known as CNPS List, is a ranking system by the Rare Plant Status Review group<sup>1</sup> and managed by the CNPS and the CDFW. A CRPR summarizes information on the distribution, rarity, and endangerment of California’s vascular plants. Plants with a CRPR of **1A** are presumed extinct in California because they have not been seen in the wild for many years. Plants with a CRPR of **1B** are Rare, Threatened, or Endangered throughout their range. Plants with a CRPR of **2A** are presumed extirpated from California, but are more common elsewhere. Plants with a CRPR of **2B** are considered Rare, Threatened, or Endangered in California, but are more common elsewhere. Plants with a CRPR of **3** require more information before they can be assigned to another rank or rejected; this is a “review” list. Plants with a CRPR of **4** are of limited distribution or infrequent throughout a broader area in California; this is a “watch” list. The Threat Rank is an extension added onto the CRPR to designate the level of endangerment by a 1 to 3 ranking. An extension of **.1** is assigned to plants that are considered to be “seriously threatened” in California (i.e., over 80 percent of the occurrences are threatened or have a high degree and immediacy of threat). Extension **.2** indicates the plant is “fairly threatened” in California (i.e., between 20 and 80 percent of the occurrences are threatened or have a moderate degree and immediacy of threat). Extension **.3** is assigned to plants that are considered “not very threatened” in California (i.e., less than 20 percent of occurrences are threatened or have a low degree and immediacy of threat or no current threats known). The absence of a threat code extension indicates plants lacking any threat information.

In addition to providing an inventory of special status plant and wildlife species, the CNDDDB also provides an inventory of vegetation types that are considered special status by the State and federal resource agencies, academic institutions, and various conservation groups (such as the CNPS). Determination of the level of imperilment is based on the NatureServe Heritage Program Status Ranks that rank both species and vegetation types on a global (**G**) and statewide (**S**) basis according to their rarity; trend in population size or area; and recognized threats (e.g., proposed developments, habitat degradation, and non-native species invasion). The ranks are scaled from 1 to 5. NatureServe considers **G1 or S1** communities to be critically imperiled and at a very high

<sup>1</sup> A group of over 300 botanical experts from the government, academia, non-governmental organizations, and the private sector.

risk of extinction or elimination due to extreme rarity, very steep declines, or other factors; **G2 or S2** communities to be imperiled and at high risk of extinction or elimination due to very restricted range, very few populations or occurrences, steep declines, or other factors; **G3 or S3** communities to be vulnerable and at moderate risk of extinction or elimination due to a restricted range, relatively few populations or occurrences, recent and widespread declines, or other factors; **G4 or S4** communities to be apparently secure and uncommon but not rare with some cause for long-term concern due to declines or other factors; and **G5 or S5** communities to be secure (Faber-Langendoen et al. 2009).

All vegetation alliances<sup>2</sup> that have State ranks of S1, S2, or S3 are considered to be highly imperiled. Currently, association ranks are not provided, but associations ranked as S3 or rarer are noted. Vegetation types considered special status includes State ranked S1-S3 as well as those which have a ranking of secure or apparently secure, but would be considered “special status” on a regional or local level, because they may support Threatened or Endangered species or because they are associated with a regulated resource (e.g., water resource under the jurisdiction of the USACE or the CDFW).

## 6.2 SPECIAL STATUS VEGETATION TYPES

Eleven vegetation types identified in the Project site that would be considered special status based on the NatureServe Heritage Program Status Ranks including: California sagebrush scrub/California buckwheat scrub, California buckwheat scrub, California buckwheat scrub/annual brome grasslands, California sycamore woodland, white alder grove/California sycamore woodland, coast live oak/California sycamore woodland, mule fat thickets, arroyo willow thickets, arroyo willow thickets/mule fat thickets, riparian herb, and coast live oak woodland. Other special status vegetation types may also be present but unidentified due to the relative scale of the study or un-observable.

Special status vegetation types are not expected to be removed with implementation Upper Arroyo eco HEP. These and other native vegetation types in the Project area are expected to increase in biological value in response to non-native species removals. However, care should be taken when working within or adjacent to special status vegetation types to minimize temporary disturbance.

## 6.3 SPECIAL STATUS PLANTS

Based on the results of the literature review described above, 30 special status plant species have been reported from the region surrounding and including the Project site. Table 2 provides a list of special status plant species and their listing status. Most of these species have some potential to occur in the Project site while some are known to occur. Others are not expected to occur based on the types of available habitats in the Project site. Note that they are grouped alphabetically according to their scientific name. Although an assessment of each plant species potential to occur was not conducted, the list provides guidance for habitat enhancement efforts to target habitats that could support special status plant species.

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<sup>2</sup> A vegetation alliance is “a classification unit of vegetation, containing one or more associations and defined by one or more diagnostic species, often of high cover, in the uppermost layer or the layer with the highest canopy cover” (Sawyer et al. 2009).



**TABLE 2  
SPECIAL STATUS PLANT SPECIES  
KNOWN TO OCCUR WITHIN THE PROJECT REGION**

Species	General Habitat/Range Description <sup>a</sup>	Status		
		USFWS	CDFW	CRPR
<i>Arctostaphylos glandulosa</i> ssp. <i>gabrielensis</i> San Gabriel manzanita	Occurs in rocky outcrops and chaparral at approximately 3,000 to 6,500 feet above msl. Known from the San Gabriel Mountains and the Mill Creek Summit area.	—	—	1B.2
<i>Astragalus brauntonii</i> Braunton's milkvetch	Occurs in brushy habitats, along fire-breaks, or in disturbed areas (e.g., landslides, road clearings). Occurs in sandstone soils with carbonate layers between sea level and 2,100 feet above msl. Known from the hills bordering the Los Angeles Basin.	FE	—	1B.1
<i>Berberis nevinii</i> Nevin's barberry	Occurs in coastal sage scrub with sandy or gravelly soils between sea level and 4,000 feet above msl. Known from Northern Los Angeles County in San Francisquito Canyon; in the San Fernando Valley and Arroyo Seco; in San Timoteo Canyon near Redlands; and near Vail Lake in Riverside County.	FE	SE	1B.1
<i>California [Erodium] macrophylla</i> round-leaved filaree	Occurs in valley grasslands and foothill woodlands between sea level and 4,000 feet above msl.	—	—	1B.1
<i>Calochortus palmeri</i> var. <i>palmeri</i> Palmer's mariposa lily	Occurs in meadows and places that are moist in early spring. Also occurs in chaparral and yellow pine forest between 3,900 and 7,200 feet above msl.	—	—	1B.2
<i>Calochortus plummerae</i> Plummer's mariposa lily	Occurs in dry rocky places, often in brush, coastal sage scrub, and yellow pine forest between sea level and 5,500 feet above msl. Known from the Santa Monica Mountains to the south face of the San Gabriel and San Bernardino Mountains, to San Jacinto Mountains.	—	—	4.2
<i>Calochortus striatus</i> alkali mariposa lily	Occurs in alkaline meadows and springs and creosote bush scrub between 2,500 and 4,500 feet above msl. Known from the Western Mojave Desert and western Nevada.	—	—	1B.2
<i>Castilleja gleasonii</i> Mt. Gleason paintbrush	Occurs in rocky places and yellow pine forest between 5,000 and 7,100 feet above msl. Known from Mt. Gleason and the San Gabriel Mountains.	—	SR	1B.2
<i>Centromadia parryi</i> ssp. <i>australis</i> southern tarplant	Occurs in saline, seasonally moist grasslands between sea level and 600 feet above msl.	—	—	1B.1
<i>Chorizanthe parryi</i> var. <i>fernandina</i> San Fernando Valley spineflower	Occurs in coastal sage scrub with sandy soils between 300 and 1,600 feet above msl. Known from the Western Transverse Ranges.	FC	SE	1B.1
<i>Chorizanthe parryi</i> var. <i>parryi</i> Parry's spineflower	Occurs in sand between 300 and 2,600 feet above msl. Known from the central and eastern South Coast, the eastern Transverse Ranges, and the northwestern edge of the Sonoran Desert.	—	—	1B.1
<i>Cladium californicum</i> California sawgrass	Occurs in alkaline marshes and swamps between sea level and 7,000 feet above msl.	—	—	2B.2

**TABLE 2  
SPECIAL STATUS PLANT SPECIES  
KNOWN TO OCCUR WITHIN THE PROJECT REGION**

Species	General Habitat/Range Description <sup>a</sup>	Status		
		USFWS	CDFW	CRPR
<i>Dodecahema leptoceras</i> slender-horned spineflower	Occurs in chaparral and coastal sage scrub in alluvial fans between 600 and 2,300 feet above msl.	FE	SE	1B.1
<i>Galium grande</i> San Gabriel bedstraw	Occurs in chaparral and oak woodland between 1,300 and 4,000 feet above msl. Known from the San Gabriel Mountains.	—	—	1A
<i>Helianthus nuttallii</i> ssp. <i>parishii</i> Los Angeles sunflower	Occurs in marshes; historically occurred in Los Angeles, San Bernardino, and Orange Counties between sea level and 1,600 feet above msl.	—	—	1A
<i>Horkelia cuneata</i> var. <i>puberula</i> mesa horkelia	Occurs in dry, sandy, coastal chaparral between 230 and 2,850 feet above msl. Known from the Outer South Coast Ranges, the South Coast (especially foothill edge of Los Angeles Basin), and Peninsular Ranges.	—	—	1B.1
<i>Imperata brevifolia</i> California satintail	Occurs in wet springs, meadows, stream banks, and floodplains between sea level and 1,640 feet above msl. Known from the Outer North Coast Ranges, the Cascade Range Foothills, the southern Sierra Nevada Foothills, the San Joaquin Valley, the South Coast, the Transverse Ranges, and the Desert to Utah, Texas, and Mexico.	—	—	2B.1
<i>Juglans californica</i> var. <i>californica</i> Southern California black walnut	Occurs in chaparral, cismontane woodland, and coastal sage scrub, generally in alluvial soils. Known from the Chino-Puente-San Jose Hills as well as from the base of the San Gabriel Mountains.			4
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i> Coulter's goldfields	Occurs in salt marshes, vernal pools, and wet places between sea level and 3,300 feet above msl.	—	—	1B.1
<i>Lepidium virginicum</i> var. <i>robinsonii</i> Robinson's pepper-grass <sup>b</sup>	Occurs in dry soils in shrublands of southwestern California and Baja California, Mexico between sea level and 9,100 feet above msl.	—	—	4.3
<i>Linanthus concinnus</i> San Gabriel linanthus	Occurs in dry, rocky slopes and montane coniferous forest between 5,500 and 9,100 feet above msl. Known from the San Gabriel Mountains.	—	—	1B.2
<i>Linanthus orcuttii</i> Orcutt's linanthus	Occurs in montane chaparral and lower montane coniferous forest between 3,600 and 7,050 feet above msl.	—	—	1B.3
<i>Lupinus peirsonii</i> Peirson's lupine	Occurs in loose, gravelly and rocky slopes, pinyon-juniper, Joshua tree, yellow pine woodlands, and desert slopes between 3,200 and 6,500 feet above msl. Known from the San Gabriel and Tehachapi Mountains.	—	—	1B.3
<i>Malacothamnus davidsonii</i> Davidson's bush-mallow	Occurs in chaparral, coastal sage scrub, and riparian areas between 1,600 and 2,300 feet above msl.	—	—	1B.2

**TABLE 2  
SPECIAL STATUS PLANT SPECIES  
KNOWN TO OCCUR WITHIN THE PROJECT REGION**

Species	General Habitat/Range Description <sup>a</sup>	Status		
		USFWS	CDFW	CRPR
<i>Muhlenbergia californica</i> California muhly	Occurs in chaparral, yellow pine forest, coastal sage scrub, wetland-riparian, riparian, stream banks, and seeps and meadows between 300 and 6,500 feet above msl.	—	—	4.3
<i>Opuntia basilaris</i> var. <i>brachyclada</i> short-joint beavertail	Occurs in dry slopes, Joshua tree woodland, and pinyon juniper woodland between 4,000 and 5,900 feet above msl. Known from the San Gabriel and eastern San Bernardino Mountains.	—	—	1B.2
<i>Orobanche valida</i> ssp. <i>valida</i> Rock Creek broomrape	Occurs in gravelly granitic talus, chaparral, and yellow pine forests between 4,000 and 6,500 feet above msl. Known from the San Gabriel Mountains.	—	—	1B.2
<i>Pseudognaphalium leucocephalum</i> white rabbit-tobacco	Occurs in sandy soils near creek banks between sea level and 1,600 feet above msl.	—	—	2B.2
<i>Ribes divaricatum</i> var. <i>parishii</i> Parish's gooseberry	Occurs in coastal sage scrub and wetland-riparian between 200 and 1,000 feet above msl.	—	—	1A
<i>Symphytotrichum</i> [Aster] <i>greatae</i> Greata's aster	Occurs in damp soils in canyons between sea level and 6,500 feet above msl. Known from the San Gabriel Mountains.	—	—	1B.3
<i>Thelypteris puberula</i> var. <i>sonorensis</i> Sonoran maiden fern	Occurs along streams and in seepage areas from sea level to 2,600 feet above msl. Known from the South coast, the western Transverse Ranges, the San Gabriel Mountains, and the San Jacinto Mountains, into Arizona and Mexico	—	—	2B.2

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; CRPR: California Rare Plant Rank; msl: mean sea level; CNDDDB: [California Natural Diversity Database](#)

**Status:**

<b>Federal (USFWS)</b>		<b>State (CDFW)</b>	
FE	Endangered	SE	Endangered
FC	Candidate	SR	Rare

**CRPR**

1A Plants Presumed Extirpated from California and are Either Rare or Extinct Elsewhere  
 1B Plants Rare, Threatened, or Endangered Throughout Their Range  
 2B Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere  
 4 Plants of Limited Distribution – A Watch List

**CRPR Threat Code Extensions**

.1 Seriously Threatened in California (over 80% of occurrences threatened; high degree and immediacy of threat)  
 .2 Fairly Threatened in California (20–80% of occurrences threatened; moderate degree and immediacy of threat)  
 .3 Not Very Threatened in California (<20% of occurrences threatened; low degree and immediacy of threat or no current threats known)

<sup>a</sup> Source for General Habitat/Range Descriptions: Allen et al. 1995 and Baldwin et al. 2012.  
<sup>b</sup> Though not currently recognized by Baldwin et al. (2012), this variety is still tracked by the CNDDDB.

Note: A dash (“—”) indicates that this is not applicable for the species.

Although some special status plants are expected to occur within the Upper Arroyo Seco HEP Project area, implementation of the plan does not require or recommend their removal. Furthermore, disturbance of special status plants shall be avoided through assessment and

monitoring of a qualified biologist prior to implementation of proposed activities. Project activities are expected to increase in the overall potential suitability for special status plants as non-native species are removed and habitat conditions are improved.

#### 6.4 SPECIAL STATUS WILDLIFE

Based on the results of the literature review described above, 35 special status wildlife species have been reported from the region surrounding the Project site. Table 3 provides a list of these species and their listing status. Most of these species have some potential to occur in the Project region while some are known to occur. Others are not expected to occur based on the types of vegetation available in the Project site. Note that they are grouped by type and listed in taxonomic order. Although an assessment of each wildlife species potential to occur was not conducted, the list provides guidance for habitat enhancement efforts to target habitats that could support special status plant species and avoid potential impacts.

**TABLE 3  
SPECIAL STATUS WILDLIFE SPECIES  
KNOWN TO OCCUR WITHIN THE PROJECT REGION**

Species	General Habitat/Range Description	USFWS	CDFW
<b>FISH</b>			
<i>Gila orcuttii</i> arroyo chub	Occurs in coastal freshwater streams and rivers that have sustained flows and emergent vegetation with substrates consisting primarily of sand or mud.	–	SSC
<i>Rhinichthys osculus</i> ssp. 3 Santa Ana speckled dace	Occurs in perennial streams with riffle habitats in clean, rocky-bottomed streams and rivers.	—	SSC
<i>Catostomus santaanae</i> Santa Ana sucker	Occurs in shallow streams with flows that run from slow to swift. Stream substrates consist of boulders, gravel, and cobble where there are growths of filamentous algae. This species is occasionally found on sandy or muddy substrates.	FT	SSC
<b>AMPHIBIANS</b>			
<i>Taricha torosa</i> Coast Range newt	Found in wet forests, oak forests, chaparral, and rolling grasslands. In Southern California, drier chaparral, oak woodland, and grasslands are used.	–	<b>SSC</b>
<i>Anaxyrus [Bufo] californicus</i> arroyo toad	Occurs in semi-arid regions near washes or intermittent streams. Streams must be of low velocity with sand or gravel substrate.	FE	SSC
<i>Rana draytonii</i> California red-legged frog	Occurs in deep ponds and slow-moving streams with emergent vegetation in forests, woodlands, grasslands, streams, wetlands, ponds, and lakes from sea level to 8,000 feet above msl.	FT	SSC
<i>Rana muscosa</i> Sierra Madre yellow-legged frog	Occurs in small, isolated populations in the San Gabriel, San Bernardino, and San Jacinto Mountains in narrow, rock-walled rivers, perennial creeks, and permanent plunge pools with intermittent creeks and pools in montane riparian and/or chaparral between 1,200 and 7,500 feet above msl.	FE	SSC
<b>REPTILES</b>			
<i>Emys marmorata</i> western pond turtle	Occurs in ponds, lakes, marshes, rivers, streams, and irrigation ditches with a rocky or muddy bottom and aquatic vegetation at elevations from sea level to approximately 6,696 feet above msl.	–	SSC
<i>Phrynosoma blainvillii</i> coast horned lizard	Occurs in scrubland, grassland, coniferous forests, and broadleaf woodland vegetation types.	–	SSC

**TABLE 3  
SPECIAL STATUS WILDLIFE SPECIES  
KNOWN TO OCCUR WITHIN THE PROJECT REGION**

Species	General Habitat/Range Description	USFWS	CDFW
<i>Anniella pulchra pulchra</i> silvery legless lizard	Requires areas with loose sandy soil, moisture, warmth, and plant cover. Occurs in chaparral, pine-oak woodland, beach, and riparian vegetation types at elevations between sea level and approximately 5,100 feet above msl.	–	SSC
<i>Lampropeltis zonata</i> ( <i>parvirubra</i> ) California mountain kingsnake (San Bernardino population)	Occurs in diverse habitats, including coniferous forest, oak-pine woodlands, riparian woodland, chaparral, manzanita, and coastal sage scrub from 800 to 9,000 feet above msl.	–	SSC
<i>Salvadora hexalepis virgulata</i> coast patch-nosed snake	Occurs in semi-arid brushy areas and chaparral in canyons, rocky hillsides, and plains at elevations from sea level to around 7,000 feet above msl.	–	SSC
<i>Thamnophis hammondi</i> two-striped garter snake	Occurs in wetlands, freshwater marsh, and riparian habitats with perennial water.	–	<b>SSC</b>
<b>BIRDS</b>			
<i>Athene cunicularia</i> burrowing owl (burrowing and some wintering sites)	Breeds and forages in grasslands and prefers flat to low, rolling hills in treeless terrain. Nests in burrows, typically in open habitats, most often along banks and roadsides.	–	SSC
<i>Strix occidentalis occidentalis</i> California spotted owl	Occurs in mature dense, multi-layered evergreen forests with a diversity of tree species, size, and tree health with open areas under canopy.	–	SSC
<i>Cypseloides niger</i> black swift	Nesting typically occurs in a moist crevice or cave on a sea cliff above the surf or on cliffs behind or adjacent to waterfalls in deep canyons.	–	SSC
<i>Empidonax traillii extimus</i> southwestern willow flycatcher (nesting)	Occurs in riparian habitats along rivers, streams, or other wetlands where dense growth of willows, mule fat, arrow-weed ( <i>Pluchea sericea</i> ), tamarisk ( <i>Tamarix</i> sp.), or other plants are present, often with a scattered overstory of cottonwood	FE	SE
<i>Lanius ludovicianus</i> loggerhead shrike	Occurs in shrublands or open woodlands with a fair amount of grass cover and areas of bare ground.	–	SSC
<i>Vireo bellii pusillus</i> least Bell's vireo (nesting)	Riparian habitats dominated by willows with dense understory vegetation between sea level and 1,500 feet above msl.	FE	SE
<i>Riparia riparia</i> bank swallow	Breeds in riparian areas with vertical cliffs and banks with fine-textured sandy soil in which it digs nesting holes.	–	ST
<i>Polioptila californica californica</i> coastal California gnatcatcher	Coastal sage scrub between sea level and about 2,000 feet above msl.	FT	SSC
<i>Setophaga petechia</i> [ <i>Dendroica petechia</i> ] yellow warbler	Riparian habitats dominated by willows with dense understory vegetation between sea level and 9,000 feet above msl.	–	<b>SSC</b>
<i>Icteria virens</i> yellow-breasted chat	For nesting, this species requires dense, brushy tangles near water and riparian woodlands that support a thick understory.	–	SSC
<b>MAMMALS</b>			
<i>Antrozous pallidus</i> pallid bat	Occurs in grasslands, shrublands, and woodlands and in open habitats with rocky areas for roosting.	–	SSC

**TABLE 3**  
**SPECIAL STATUS WILDLIFE SPECIES**  
**KNOWN TO OCCUR WITHIN THE PROJECT REGION**

Species	General Habitat/Range Description	USFWS	CDFW		
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Occurs in oak woodlands, arid deserts, grasslands, and high-elevation forests and meadows. Roosts in limestone caves, lava tubes, and man-made structures.	–	SSC		
<i>Lasionycteris noctivagans</i> silver-haired bat	Typically hibernates in small tree hollows, beneath sections of tree bark, in buildings, rock crevices, in wood piles, and on cliff faces. Occasionally will hibernate in the entrances to caves, especially in northern regions of their range.	–	SA		
<i>Lasiurus frantzii</i> western red bat	Occurs in riparian habitats dominated by cottonwoods, oaks, sycamores, and walnuts.	–	SSC		
<i>Aeorestes cinereus</i> hoary bat	Occurs in open habitats or habitat mosaics with access to trees for cover and roosts in dense foliage of medium to large trees. Also uses trees in urban areas several miles away from undeveloped habitat.	–	SA		
<i>Dasypterus xanthinus</i> western yellow bat	Little is known about its habitat, but it is known to roost in leafy vegetation. This species is associated with dry thorny vegetation in the deserts of the southwestern U.S., the Mexican Plateau, and coastal western Mexico.	–	SSC		
<i>Eumops perotis californicus</i> western mastiff bat	Found in many open semi-arid to arid habitats, including conifer and deciduous woodlands, coastal scrub, grasslands, palm oases, chaparral, desert scrub, and urban areas. Typically forages in open areas with high cliffs and roosts in small colonies in crevices on cliff faces.	–	SSC		
<i>Nyctinomops macrotis</i> big free-tailed bat	Feeds primarily on moths caught while flying over water sources in suitable habitat in the southwestern U.S. This species prefers rugged, rocky terrain and roosts in crevices in high cliffs or rocky outcrops.	–	SSC		
<i>Lepus californicus bennettii</i> San Diego black-tailed jackrabbit	Occurs in herbaceous and desert-shrub areas and open, early stages of forest and chaparral habitats.	–	SSC		
<i>Onychomys torridus ramona</i> southern grasshopper mouse	Occurs in grassland and sparse scrub vegetation types and prefers sandy soils.	–	SSC		
<i>Perognathus longimembris brevinasus</i> Los Angeles pocket mouse	Occurs between 550 and 2,650 feet above msl in lower elevation grasslands and coastal sage scrub vegetation with open ground and fine sandy soils.	–	SSC		
<i>Taxidea taxus</i> American badger	Occurs in wide variety of habitats, but is most commonly associated with grasslands and other relatively open habitats with friable, uncultivated soils.	–	SSC		
<p>USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; msl: mean sea level</p> <p><b>Status Definitions</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; vertical-align: top;"> <p><b>Federal (USFWS) Status</b></p> <p>FE Endangered</p> <p>FT Threatened</p> <p>ST Threatened</p> </td> <td style="width: 50%; vertical-align: top;"> <p><b>State (CDFW) Status</b></p> <p>SSC Species of Special Concern</p> <p>SE Endangered</p> <p>SA Special Animal</p> </td> </tr> </table> <p>Notes: Scientific and common names for wildlife species follow the most current list of Special Animals (January 2019) available from the CDFG (<a href="http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp">http://www.dfg.ca.gov/biogeodata/cnddb/plants_and_animals.asp</a>).</p>				<p><b>Federal (USFWS) Status</b></p> <p>FE Endangered</p> <p>FT Threatened</p> <p>ST Threatened</p>	<p><b>State (CDFW) Status</b></p> <p>SSC Species of Special Concern</p> <p>SE Endangered</p> <p>SA Special Animal</p>
<p><b>Federal (USFWS) Status</b></p> <p>FE Endangered</p> <p>FT Threatened</p> <p>ST Threatened</p>	<p><b>State (CDFW) Status</b></p> <p>SSC Species of Special Concern</p> <p>SE Endangered</p> <p>SA Special Animal</p>				

Although some special status wildlife species are expected to occur within the Upper Arroyo Seco HEP Project area, implementation of the plan does not require or recommend their removal.

Furthermore, disturbance of special status wildlife species shall be avoided through assessment and monitoring of a qualified biologist prior to implementation of proposed activities. Project activities are expected to increase in the overall potential suitability for special status wildlife species as non-native species are removed and habitat conditions are improved.

#### **6.4.1 NESTING BIRDS**

Nesting birds are protected as stipulated in Sections 3503, 3503.5, and 3513 of the California Fish and Game Code as well as the MBTA as described in Section 2.8 above.

Bird species protected by the State and federal regulation occur throughout the Upper Arroyo Seco and seasonal nesting would be expected within all potential work areas. It is anticipated that nearly all habitat enhancement tasks will occur during the non-nesting bird season—i.e., between September 1 and March 14. However, if some tasks are performed during the nesting bird season (March 15 to August 31), a nesting bird survey may need to be conducted by a qualified biologist to identify potential active nests and implement avoidance measure to comply with regulations and ensure nesting birds are not impacted.

#### **6.5 JURISDICTIONAL RESOURCES**

Riparian habitats within the Project site include California sycamore woodland, white alder grove/California sycamore woodland, coast live oak/California sycamore woodland, mule fat thickets, arroyo willow thickets, arroyo willow thickets/mule fat thickets, and riparian herb. Riparian habitats are often under the jurisdiction of the USACE, the RWQCB, and CDFW due to their association with “waters of the U.S.”, or streambeds as previously described in Section 2.8. However, it should be noted that the riparian habitats described above are not equivalent to areas subject to the jurisdiction of the USACE, the RWQCB, or the CDFW. Only the portion of these habitats associated within a discernible streambed and/or adjacent wetlands that meet certain criteria are within the jurisdiction of these regulatory agencies. Similarly, upland habitat types (e.g., mixed coastal sage scrub and mixed chaparral) or disturbed and developed areas may be within the jurisdiction of these agencies if they occur within a discernible streambed.

All of the surface water conveyance features (natural creeks and channelized flows) in the Project site are expected to be regulated under the jurisdiction of the USACE, the RWQCB, and CDFW. Efforts will be taken to avoid or minimize negative impacts on jurisdictional resources during proposed habitat enhancement activities. Implementation of the Upper Arroyo Seco HEP is expected to result in long term increased biological values of existing jurisdictional resources, especially riparian habitat.

#### **6.6 PROTECTED TREES**

A variety of non-native and native tree species are located throughout the Project area. All California native tree species are to be protected and remain in place. Removal of non-native trees is proposed and will be approved by the City’s Urban Forestry Advisory Committee (UFAC) prior to removal. As described in detail in Appendix A (Specifications), the City’s *Tree Protection Ordinance* and *Tree Protection Guidelines* shall be followed during non-native vegetation removal tasks.

- A Root Protection Zone (RPZ) shall be maintained around all protected trees. The RPZ shall be located at the drip line of the trees, or 15 feet from the trunk, whichever method defines a larger area.
- If any work is required within an RPZ of a California native tree species, it should be accomplished with hand tools (exception: removal of a non-native tree whose trunk occurs

within the dripline of a protected tree, and/or whose canopy is intergrown with a protected tree).

- Cutting of protected tree roots shall be avoided to the greatest extent possible. No roots larger than two inches shall be cut.
- If pruning of a protected tree is required to provide sufficient clearance to accomplish the tasks described herein, prior written consent shall be obtained from the City on a case-by-case basis.



## 7.0 INVASIVE/NON-NATIVE VEGETATION REMOVAL

The highest priority enhancement activity identified is non-native plant removal. A non-native plant (weed') is defined as a species that does not historically occur within a region and has been introduced to that region by human activities. Some non-native plant species are considered 'invasive' because they can *aggressively* proliferate and alter the composition and quality of natural habitats. As described below, plant removal can include (1) above- and below-ground living plant tissues; and (2) non-living materials (e.g., leaves) of certain non-native plant species that can degrade habitat quality.

It is typically most effective to perform weed control in a top-down manner (1) along a watercourse, as water-borne seeds can re-infest downstream habitat areas; and (2) on slopes, as wind-borne seeds can more readily move downslope (than upslope) by means of wind or during rain events. By eliminating sources of weed seeds in upstream and upslope areas, the re-infestation of habitats can be reduced from year to year, along with associated effort and cost to achieve project objectives. For this reason, the City of Pasadena will prioritize the removal of upstream/upslope vegetation as a key component of the HEP.

It is most effective to remove non-native plants prior to seed production and dispersal, to avoid the formation of a 'seed bank' of weed seeds in the soil that would produce crops of non-native plants in subsequent years. In coastal Southern California's mild climate, various weed species can grow and disperse seed over a long period. The growth and reproduction cycles of most non-native plants coincide with the seasons during which wildlife species are especially sensitive to disturbance (e.g., nesting birds), as described in Section 6. Therefore, all non-native vegetation removal tasks shall be performed in a manner that avoids adverse impacts to wildlife species. Damage to native plant species shall be minimized, and special status plant species shall be protected.

It is anticipated that nearly all non-native plant removal will be performed without the use of herbicides. The use of select herbicides may be allowed by the City of Pasadena on a case-by-case basis, and this would require prior written approval (i.e., prior to storing or applying such materials on the Project area) by the City, for each spray event (dates and locations to be defined in advance).

Aside from non-native tree removal, non-native plant removal will include hand-pulling, the use of hand tools, and hand-operated machinery such as string trimmers. The type(s) of equipment to be used will depend on the specific conditions at each treatment location—e.g., vehicular, or pedestrian (only) access; steep terrain; dense vegetation; utility towers/poles/lines or subsurface features; fire-prone areas, etc.

The 100 percent eradication of herbaceous weed species (i.e., non-native annual/perennial grasses and broadleaf herbs) in the Project site is not achievable, due to (1) the large size of the Project site; (2) the inflow of weed seeds from off-site, upper canyon areas (e.g., Angeles National Forest); and (3) the occurrence of weed seed sources in inaccessible areas of steep terrain. However, select highly invasive weeds such as giant cane (*Arundo donax*) should be controlled as much as possible to avoid the further degradation of native habitat areas.

This activity would typically be more intensive in the initial years of a removal program, then diminish over multiple years until reaching a consistent annual management level of effort. A successful non-native plant removal program will result in more sustainable and healthier native habitat where native plant and animal species would be able to expand into previously occupied lands.

The numbered locations of all invasive/non-native vegetation removal and treatment areas are shown in Exhibit 3, and a matrix describing the specific details for each numbered removal location is provided in Appendix A.

## 7.1 NON-NATIVE TREES

A total of 97 non-native trees within the Project site were identified for removal. The numbered locations of all non-native tree removals (and other non-native vegetation to be removed) are shown on Exhibit 3, and a matrix describing the specific details for each numbered tree removal location is provided in Appendix A. Note that some tree numbers are listed as xx-1, xx-2 in Table A-2 (this indicates more than one tree at point xx on the map). Nine tree species were identified including Aleppo pine (*Pinus halepensis*), Canary Island pine (*Pinus canariensis*), blue gum (*Eucalyptus globulus*), Chinese elm (*Ulmus parviflora*), common fig (*Ficus carica*), shamel ash (*Fraxinus uhdei*), Siberian elm (*Ulmus pumila*), Mexican fan palm (*Washingtonia robusta*) and Peruvian pepper tree (*Schinus molle*).

### 7.1.1 CUT-AND-PAINT STUMP TREATMENT

If approved by the City of Pasadena, the stumps of select non-native trees shall be treated with an appropriate herbicide immediately after cutting (i.e., within five minutes) to facilitate root kill and minimize re-sprouting. Any herbicide that is applied near surface waters shall be approved by the U.S. Environmental Protection Agency (USEPA) for application to aquatic habitat areas.

### 7.1.2 ALLELOPATHIC LITTER

The leaves of some invasive/non-native species (e.g., *Eucalyptus* spp.) can exhibit 'allelopathic' properties—i.e., a build-up of such leaves (or exfoliated bark) on the soil surface, can suppress the germination and growth of desirable native plant species. Therefore, when certain invasive/non-native species are removed, in addition to killing/removing the plant, the associated mat of leaves/bark beneath the non-native tree should be bagged and removed from the Project area.

### 7.1.3 RETENTION OF COARSE WOODY DEBRIS OR SNAGS

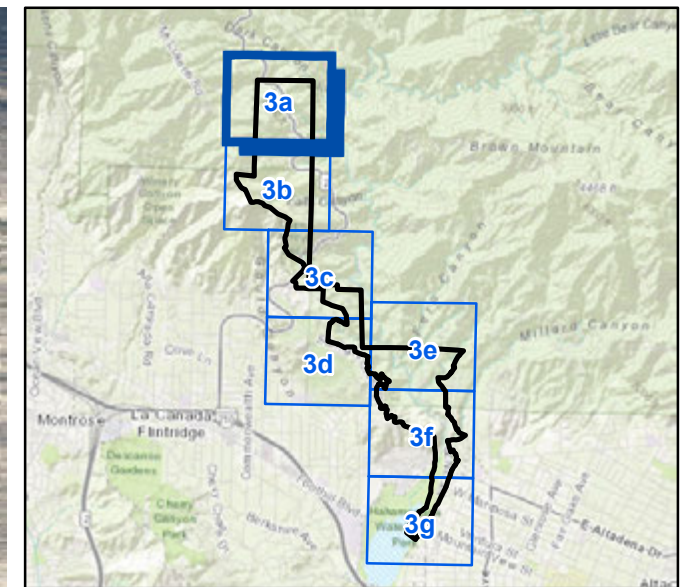
The City of Pasadena may elect to retain some of the felled invasive/non-native trees on site, due to the lack of a feasible way to haul-out the material from remote locations, or to use the coarse woody debris as natural barriers to deter unwanted human entry to sensitive habitats or unsafe areas. The City may also decide that, some non-native trees that are located away from human use areas, may be girdled (potentially using the 'slash-and-paint' herbicide method) and retained in place to provide wildlife value as dead 'snags'.

The City's decisions on the retention of such materials will occur on a case-by-case basis, during project implementation.





## 7.2 NON-NATIVE SHRUBS

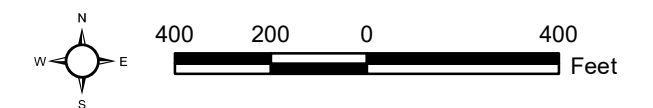
Non-native shrubs to be removed from the Project site include Spanish broom (*Spartium junceum*), non-native cactus (e.g., *Opuntia* sp.), tree tobacco (*Nicotiana glauca*), and castor bean (*Ricinus communis*). The locations of non-native shrubs to be removed are shown on Exhibit 3, and a matrix describing the specific details for each numbered removal location is provided in Appendix A.

- If a non-seed-bearing non-native shrub is removed from a remote upland location (where hauling out the material is problematic), the City of Pasadena may approve retaining the



**Weed Polygon Data**

-  Spanish broom
-  Spanish broom, tree tobacco
-  castor bean, smilo grass
-  Enhancement Area 4

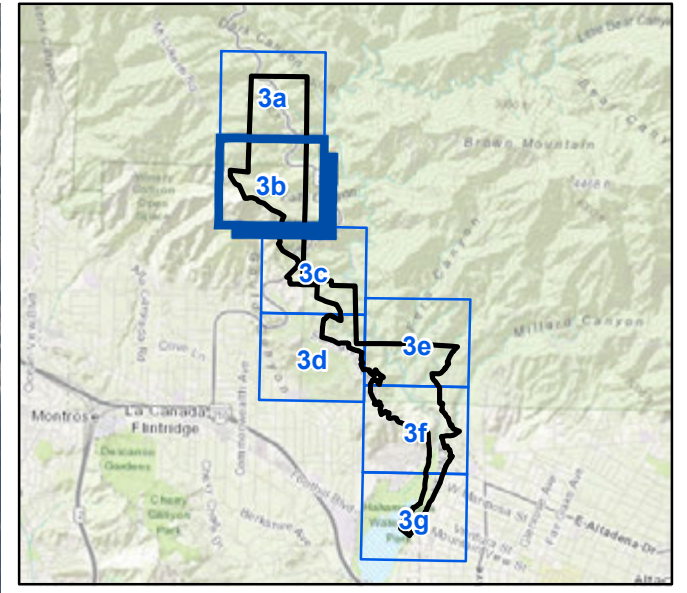
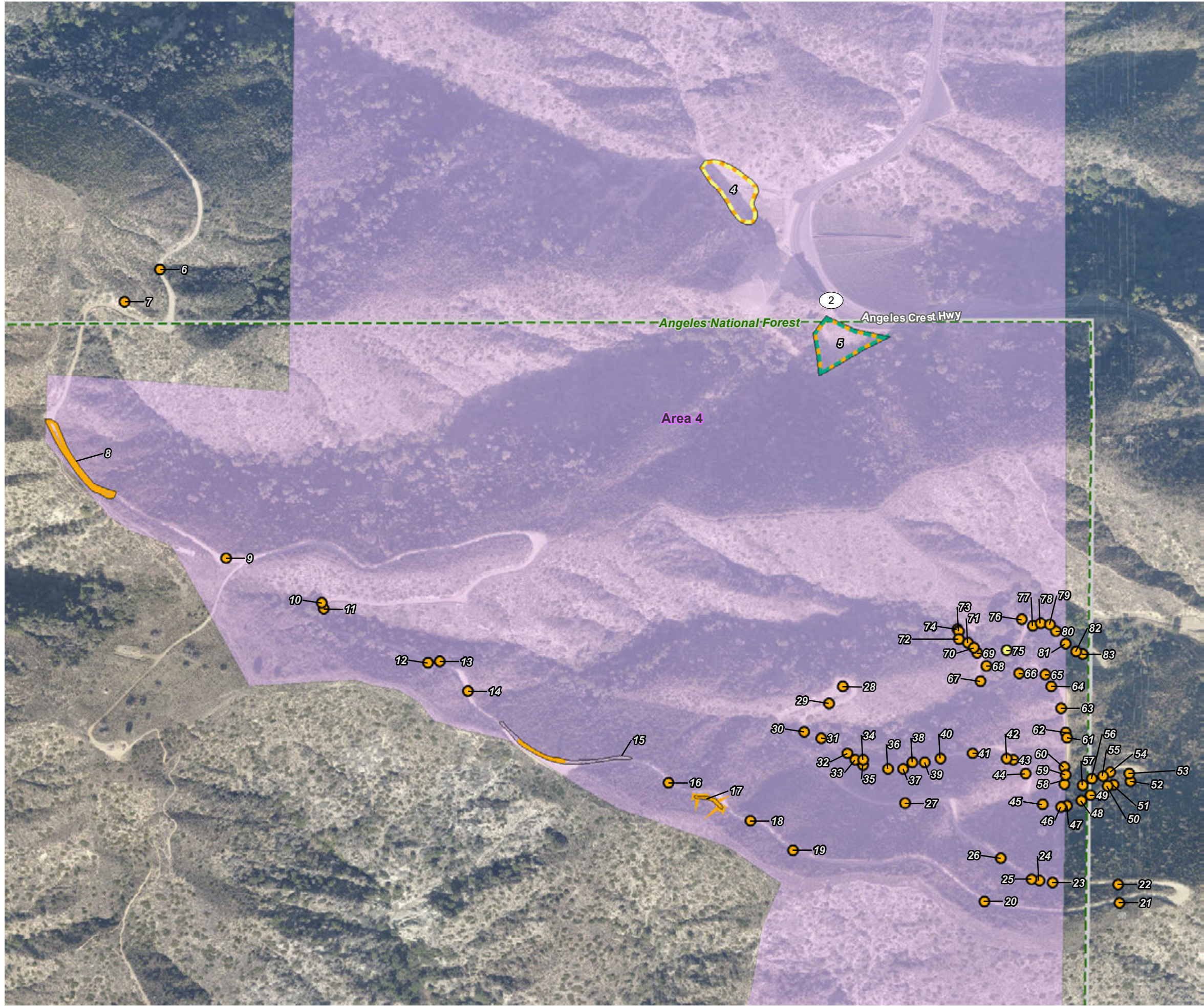


Aerial Source: LAR-IAC 2014

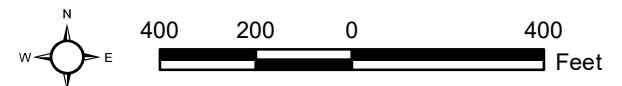
**Non-Native Removals Exhibit 3a**

*Upper Arroyo Seco  
Habitat Enhancement Plan*





- Weed Polygon Data**
- Spanish broom
  - Spanish broom, castor bean, tree tobacco
  - Spanish broom, tree tobacco
  - Enhancement Area 4
  - tree tobacco
  - Spanish broom



Aerial Source: LAR-IAC 2014

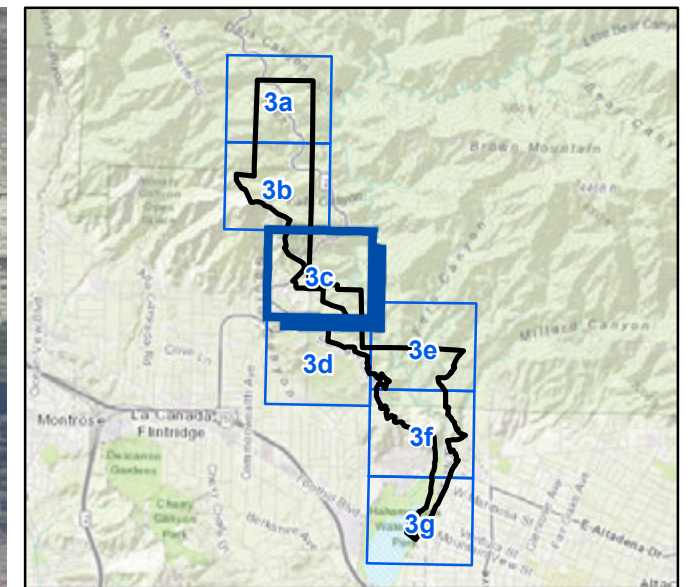
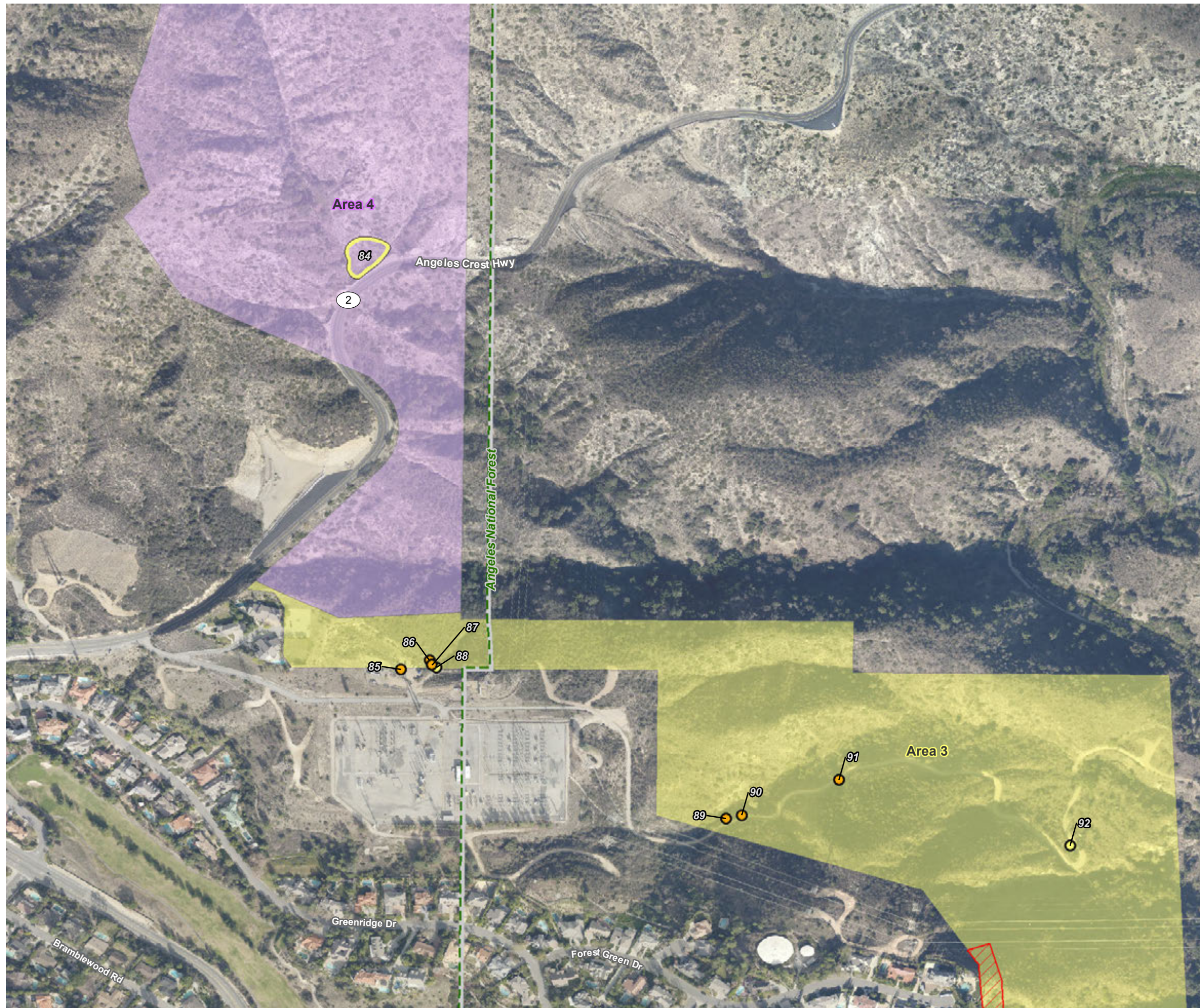
**Non-Native Removals Exhibit 3b**  
 Upper Arroyo Seco  
 Habitat Enhancement Plan









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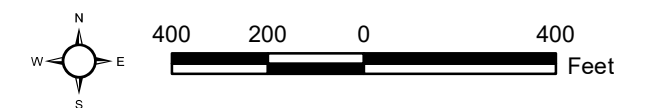
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**Weed Polygon Data**

-  tree tobacco
-  Residential Buffer Areas
-  Enhancement Area 3
-  Enhancement Area 4
-  tree tobacco
-  Spanish broom

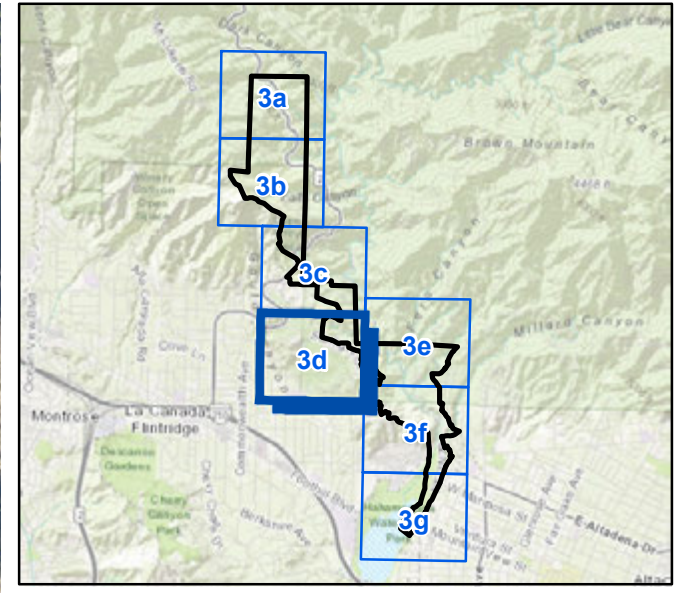
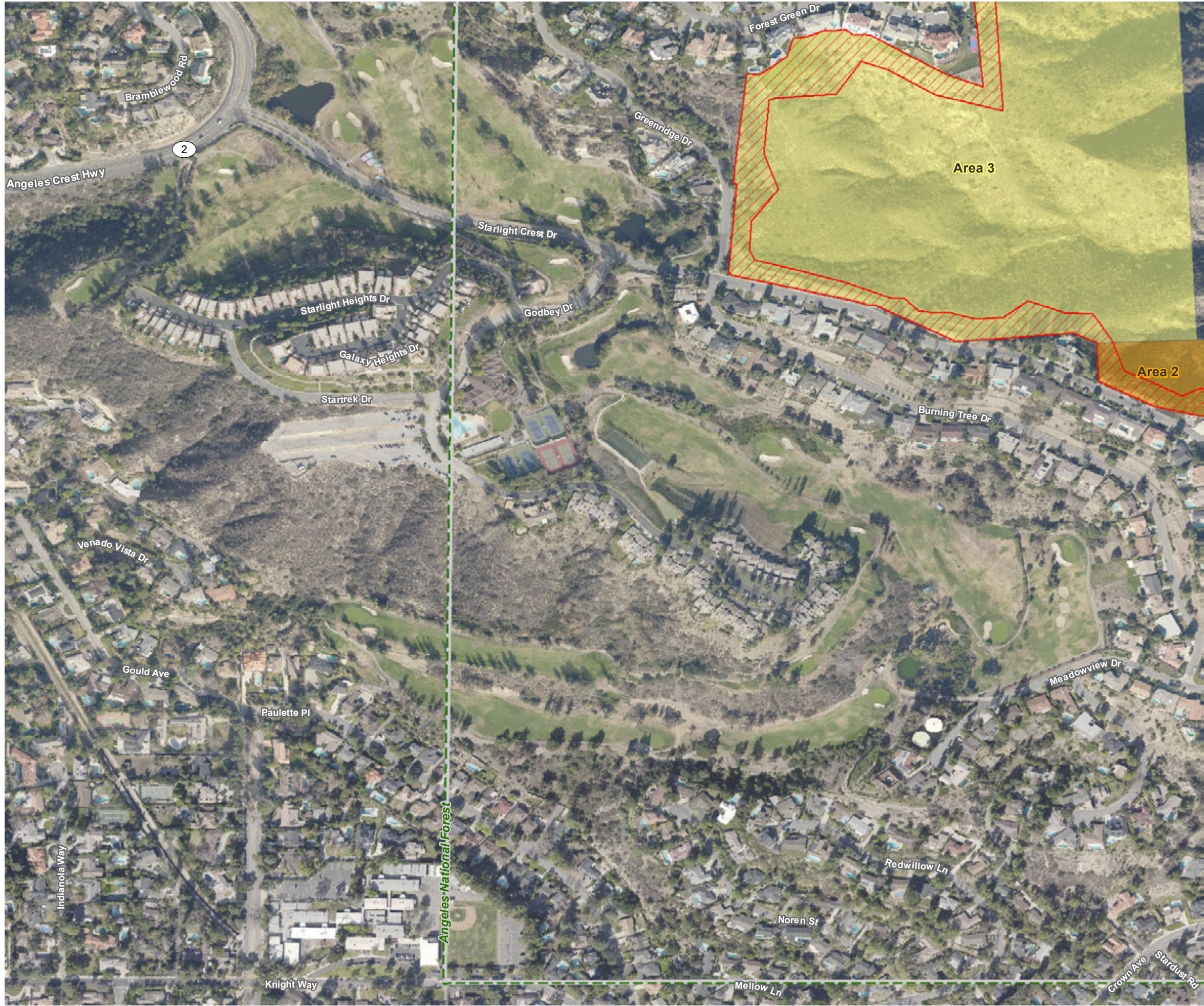





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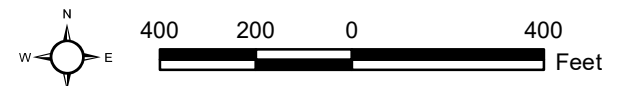
**Non-Native Removals Exhibit 3c**  
*Upper Arroyo Seco  
 Habitat Enhancement Plan*



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-  Residential Buffer Areas
-  Enhancement Area 2
-  Enhancement Area 3



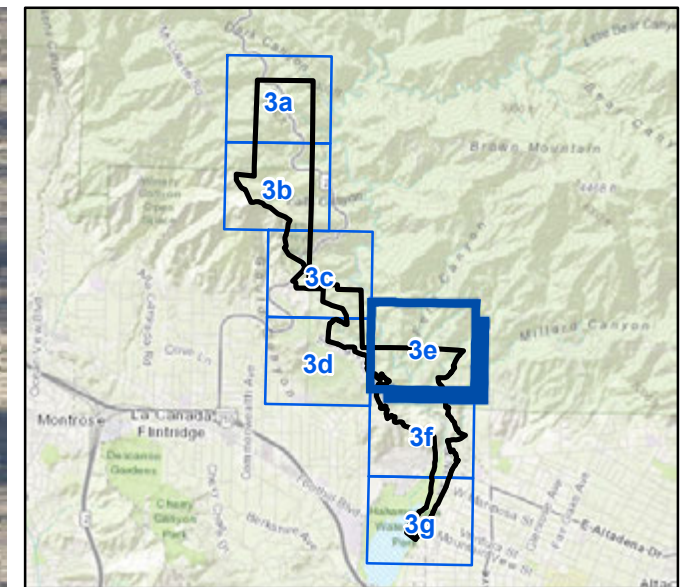
Aerial Source: LAR-IAC 2014

**Non-Native Removals Exhibit 3d**  
 Upper Arroyo Seco  
 Habitat Enhancement Plan



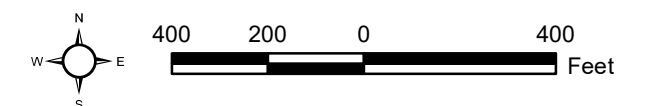
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**Weed Polygon Data**

-  ivy, periwinkle
-  Non-natives within ANF property
-  Residential Buffer Areas
-  Enhancement Area 2
-  blue gum eucalyptus
-  castor bean
-  Spanish broom
-  Canary Island pine
-  Aleppo pine
-  Native Grassland Restoration Potential

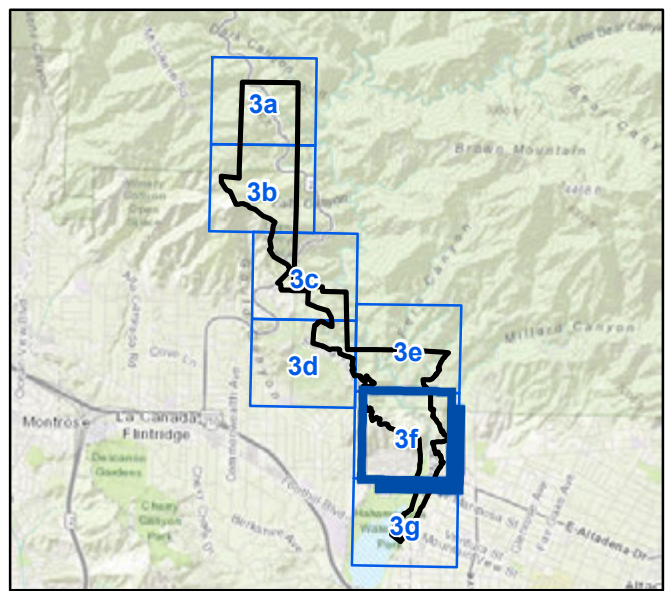
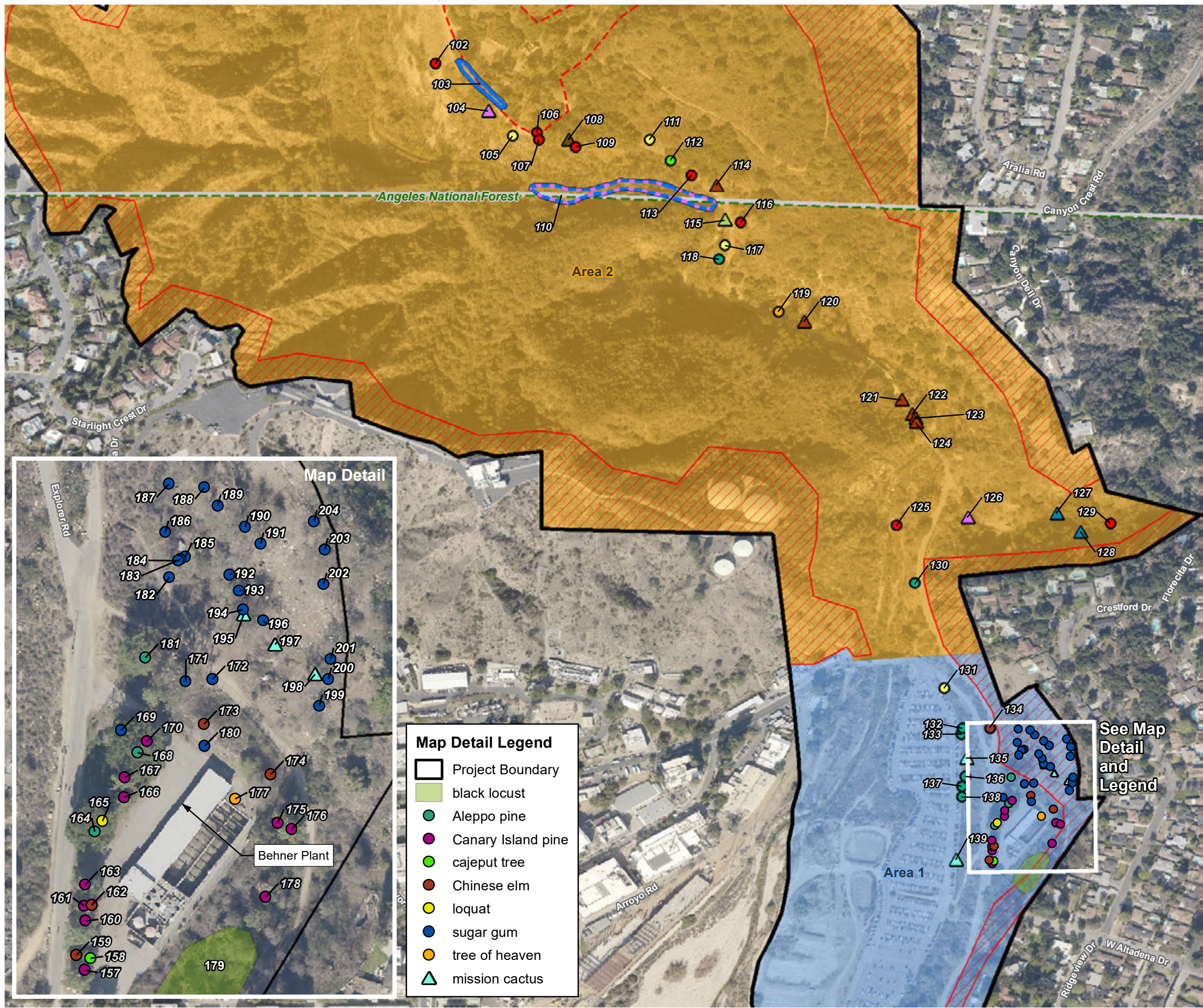


Aerial Source: LAR-IAC 2014

**Non-Native Removals Exhibit 3e**

*Upper Arroyo Seco  
Habitat Enhancement Plan*

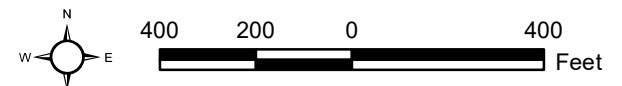




- Project Boundary
- ivy, periwinkle
- periwinkle
- Non-natives within ANF property
- Residential Buffer Areas
- Enhancement Area 1
- Enhancement Area 2
- blue gum
- castor bean
- Chinese elm
- common fig
- Spanish broom
- tree tobacco
- ivy
- mission cactus
- Canary Island pine
- Aleppo pine
- Siberian elm
- Mexican fan palm

- Map Detail Legend**
- Project Boundary
  - black locust
  - Aleppo pine
  - Canary Island pine
  - cajeput tree
  - Chinese elm
  - loquat
  - sugar gum
  - tree of heaven
  - mission cactus

See Map Detail and Legend

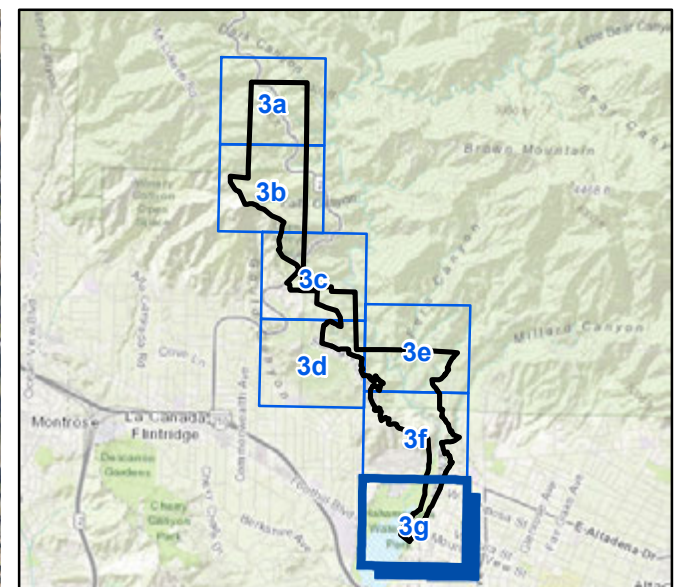







Aerial Source: LAR-IAC 2014

**Non-Native Removals Exhibit 3f**  
*Upper Arroyo Seco Habitat Enhancement Plan*

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-  Residential Buffer Areas
-  Enhancement Area 1
-  blue gum eucalyptus
-  tree tobacco
-  Peruvian pepper







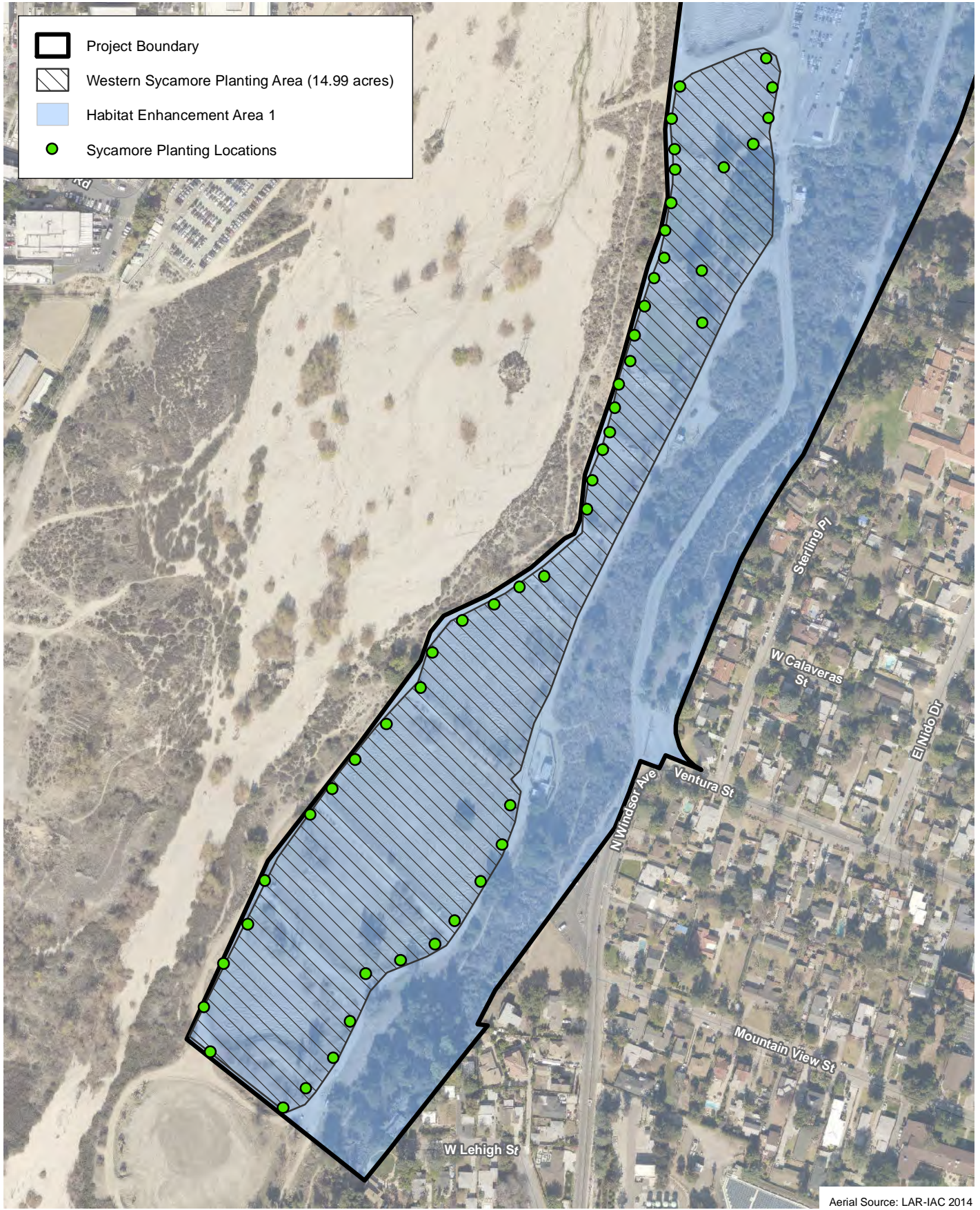
Aerial Source: LAR-IAC 2014

**Non-Native Removals Exhibit 3g**  
*Upper Arroyo Seco  
 Habitat Enhancement Plan*



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-  Project Boundary
-  Western Sycamore Planting Area (14.99 acres)
-  Habitat Enhancement Area 1
-  Sycamore Planting Locations



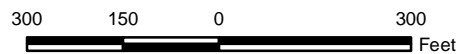
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Aerial Source: LAR-IAC 2014

## Sycamore Planting Area

*Upper Arroyo Seco Habitat Enhancement Plan*

## Exhibit 4



cut brush on site. No non-native vegetation that is removed from *riparian* areas shall be retained within the floodway; such vegetation shall either be (a) totally removed from the Project site; or (b) removed to a City-approved upland location, outside the floodway of Arroyo Seco. Non-native shrub species that are able to reproduce vegetatively (from root/stem tissues, sans seeds) shall be totally removed from the Project site.

- Any mature seed and seed heads shall be carefully removed from non-native shrubs to the extent practicable, and placed in plastic bags, prior to cutting and removing a shrub, to minimize seed dispersal.
- If approved by the City of Pasadena, the stumps of select non-native shrubs shall be treated with an appropriate herbicide immediately after cutting (i.e., within five minutes) to facilitate root kill and minimize re-sprouting. Any herbicide that is applied in or near surface waters shall be approved by the U.S. Environmental Protection Agency (USEPA) for application to aquatic habitat areas.

### 7.3 NON-NATIVE ANNUAL AND PERENNIAL HERBS

Broadleaf weeds in the Project site include species such as German ivy (*Delairea odorata*), English ivy (*Hedera helix*) and periwinkle (*Vinca major*). Non-native grasses in the Project area include smilo grass (*Stipa miliaceum*) and wild oat grass (*Avena fatua* and *Avena barbata*). Ivy (German/English) is identified on Exhibit 3 and detailed in the Non-Native Removal Matrix in Appendix A, non-native grasses were generally too voluminous and prolific to be mapped and itemized.

#### 7.3.1 BROADLEAF WEEDS

- Broadleaf weeds should be removed prior to seed set/dispersal to the extent practicable, to minimize ongoing re-infestation.
- Broadleaf weeds can be removed either by hand-pulling, the use of hand tools (e.g., hoe/shovels), or via hand-operated machinery (e.g., string-trimmers).
- Where broadleaf weeds occur sparsely and are not seed-bearing, the City of Pasadena may decide to leave the cut materials in place (and not remove from site). Where broadleaf herbs are dense and/or seed-bearing, they should be bagged or placed on 'mantas' and removed from the site in a manner that minimizes seed dispersal.
- If broadleaf weeds are treated with herbicide (Per City approval, as described above), it is best to apply the herbicide when the weeds are at the small seedling stage, to minimize the amount of chemical that is applied in the natural area.

#### 7.3.2 NON-NATIVE GRASSES

- Non-native grasses are well established and typically abundant in virtually all natural areas in southern California, and total eradication is impossible. The City of Pasadena will primarily focus its invasive/non-native vegetation removal efforts on the ongoing removal of non-native trees and shrubs, and the control of invasive broadleaf weeds in key areas. Non-native grasses will only be targeted for removal in areas where (a) they present a fire hazard (e.g., near roads, parking areas, and trails); and (b) along trails or other public areas where a build-up of weedy grasses restricts access or degrades landscape aesthetics.

## 7.4 ORNAMENTAL PLANT SPECIES

Natural areas at the urban-wildland interface often include numerous non-native, ornamental plant species (e.g., succulents such as agave) that were installed (in some cases, many years ago) by well-intentioned citizens. This includes ornamental plants that are located in fuel modification zones (FMZs) that are immediately adjacent to residential, commercial, or industrial properties.

The Project site includes an approximate four-mile (combined) frontage along residential properties and streets in upper slope areas on the east and west sides of the canyon, as shown on Exhibit 1. Aerial imagery indicates that vegetation clearing—presumably for fuel modification purposes—is occurring behind numerous homes in these areas, including areas that are 100 feet or greater in width from the apparent private property boundaries. These FMZ-type areas are subject to ongoing disturbance that creates opportunities for weed proliferation, and for the undesirable spreading of planted landscape species (around homes and along streets) into natural areas.

The City of Pasadena will conduct a public outreach program to identified homeowners, businesses, and institutions along these wildland interface areas, on the importance of (a) avoiding unauthorized impacts to native vegetation/wildlife; (b) preventing weed proliferation; (c) avoiding adverse impacts to wildlife (and how to avoid the undesired *attraction* of wildlife onto private properties); (d) using drought-friendly, non-invasive, non-fire-prone plant species for home/institutional landscaping; (e) environmentally suitable methods of erosion control; and (f) safety guidelines for human activities on City-owned property; in the context of overall fire risk management. Additionally, the City will review internal vegetation maintenance policies and methods for these FMZ-type areas within the City's management responsibility and modify practices where feasible to reduce the spread of non-native plant species and encourage reestablishment of native vegetation. It is likely that the most effective methods of altering vegetation maintenance without jeopardizing City's fuel modification responsibilities is scheduling string trimming to occur prior to seed set of non-native weeds. This timing is likely earlier than current practice and may result in the need for a second period of string trimming to adequately meet fuel modification requirements. This modification, if feasible, over this large area and over the course of many years may have a substantial effect on reducing weed seed sources and significantly enhance native habitat in the watershed over the long term. It should be noted that this assessment is based on ecological values and the City will need to evaluate effects on fuel modification more specifically.

## 8.0 NATIVE PLANT AND SEED INSTALLATION

Although the enhancement of habitat in the Project site is expected to be accomplished primarily via invasive/non-native plant removal, some limited planting and seeding of native species (i.e., ‘active restoration’) will be included in the program. In Areas 2, 3, and 4, where invasive/non-native plants will mainly be removed from areas that are already vegetated with native species, natural ‘recruitment’ of native seedlings (from adjacent seed sources) will be expected to ‘volunteer’ into the gaps where weeds formerly occurred (i.e., ‘passive restoration’). By contrast, Area 1 includes large areas of bare ground or low, herbaceous weed cover—i.e., the numerous basins that constitute the Arroyo Seco spreading grounds. With the exception of western sycamore plantings (as described below), all container plants, cuttings, and/or seed mixes to be installed shall be of local genetic origin—i.e., the Arroyo Seco subwatershed and adjacent/nearby subwatersheds of the coastal slope of the San Gabriel Mountains, within the Los Angeles River watershed. In addition, plantings shall be consistent with the HWP Master Plan Planting Guidelines (see Page 3-40) and proposed palettes described Appendix C (City of Pasadena 2003a). The ‘active’ restoration tasks that are proposed for the Project site, are described below by Enhancement Area (1 through 4).

Native container plants should be propagated by a qualified native plant-specialist nursery located in the Project vicinity that maintains an effective pest exclusion program.

If native seeding will be performed in the Project site, then native seeds should be collected in advance from local wildlands by a qualified native seed collector (up to 2, 3, or more years prior to application, depending on plant species [duration of viability in storage is variable]). Seed collection should be performed in a manner that does not impact (a) native plant populations’ ability to regenerate (i.e., a limited quantity of seed should be collected from any single plant, or patch of plants); (b) wildlife forage values. Native seed should be properly cleaned, then stored in cool/dry conditions, until application. Some plant seed requires special handling during collection and storage (e.g., oak acorns) to retain viability prior to sowing.

### 8.1 AREA 1 (‘SPREADING GROUNDS’)

The western boundary of Area 1 defines a portion of the east edge of the mitigation area for Los Angeles County Public Works’ Devil’s Gate Reservoir sediment removal project. Area 1 includes excellent vehicular and pedestrian access for habitat enhancement task implementation.

#### 8.1.1 CONTAINER PLANTING

It is proposed that a total of 50, 15-gallon western sycamore trees be installed at the locations shown on Exhibit 4 to improve habitat values for wildlife (e.g., raptor perching/nesting opportunities), and to improve aesthetic values (and shading) for users of local trails. The planting of western sycamores on the side slopes of the detention basins (mainly along the western edge) is not expected to substantially impact the function (e.g., retention volume) or maintenance program for the basins (numerous western sycamore trees already exist along the eastern edge [mainly] of the basins). The western sycamore trees shall only be obtained from Tree of Life Nursery (TOLN) in San Juan Capistrano, because TOLN’s stock is considered to be the ‘wild type’ (non-hybrid) form of this tree species. The widespread hybridization of native sycamores with non-native landscape species within the *Platanus* genus (including nursery stock) is well-documented to occur in California, and it is ecologically inappropriate to plant hybrid specimens within a natural area. No line irrigation system is proposed to be used for the western sycamore plantings; instead, the trees will be provided with temporary irrigation via a water truck. The planting details for sycamore installation are provided in Appendix A. These proposed sycamore plantings are consistent with the HWP Master Plan proposed restoration projects (see Page 3-

18) and specifically proposed project no. 3 (see Page 3-21) regarding riparian planting around spreading basins. The recommended species are consistent with HWP Master Plan Appendix C proposed palettes (see Table C-6 of Page C-7) with modified spacing due to linear nature of available planting space.

### **8.1.2 SEED MIX APPLICATION**

A diversity of genetically-local native seed materials (trees, shrubs, herbs, grasses, vines) should be collected on an ongoing basis for application to key portions of the Project site. It is not anticipated that large areas will be seeded—e.g., hydroseeding of large slopes—as this is beyond the scope of the Project. Rather, seeding may be performed in select, limited areas where (a) a large non-native tree or a patch of non-native shrubs has been removed; and (b) along roads and trails for interpretive and aesthetic value. Species collected and location of distribution shall be consistent with the Planting Guidelines (see Page 3-40) and the proposed palettes described in Appendix C of the HWP Master Plan.

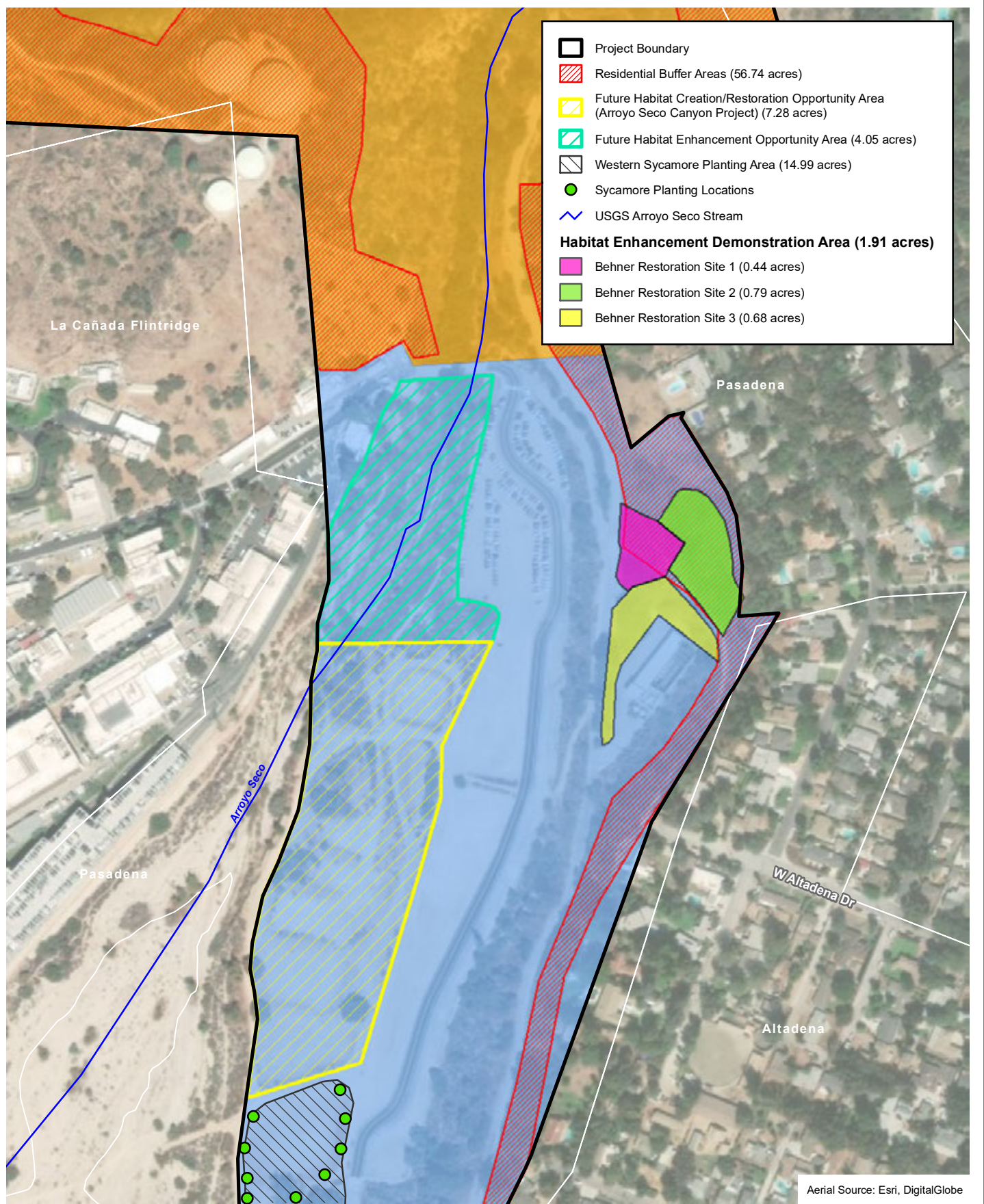
- Labeled packets of genetically-local seeds of native wildflowers and grasses could be prepared, and provided by the City to community groups for sowing along trails, around picnic areas, etc.

### **8.1.3 ARROYO SECO CANYON PROJECT**

Area 1 includes areas that are expected to be impacted by the Arroyo Seco Canyon Project (ASCP), as generally shown on Exhibit 1 and in more detail in Exhibit 5. Upon the completion of the proposed ASCP, substantial habitat creation/restoration/enhancement (and habitat mitigation) opportunities would exist in these areas. Because the specific design and implementation schedule of the ASCP are not yet known, the HEP does not include specific restoration parameters for these areas, and so they are labeled on Exhibit 1 as ‘Future Habitat Creation/Restoration/Enhancement Opportunity’ areas. In general, mitigation opportunities in this 7.28-acre area include enhancement, restoration, and potentially creation of riparian scrub vegetation types such as mulefat scrub as well as riparian woodland vegetation types such as cottonwood-willow riparian woodland or sycamore-oak riparian forest. The vegetation types are present minimally and the hydrology within this area appears likely to be able to support a much greater extent of these communities which are considered high biological value for the region. In order to be accepted as mitigation per agency permits/agreements, restoration would likely be required to incorporate a full understory component and assurance of long term preservation in perpetuity. While feasible from an ecological perspective, the City will need to evaluate long term facility maintenance requirements to identify areas that can meet the expected requirements of mitigation and take subsequent step for agency approval prior to preparation of site specific mitigation plans per agreement/permit conditions.

### **8.1.4 BASIN RESTORATION**

Area 1 includes several basins that constitute the Arroyo Seco Spreading Grounds. These basins are currently maintained to be mostly unvegetated. If the current management practices are revised to allow for extensive revegetation of the basins (basin bottoms, and/or side slopes), then a project-specific, comprehensive restoration plan should be developed to potentially include the installation of a temporary line irrigation system, container planting of a diverse palette of native tree/shrub/herbaceous species (including ‘emergent’ wetland species such as rushes and sedges, as appropriate), and the application of native seed mixes. This would be in addition to sycamore plantings, described above in Section 8.1.1, which are limited to the top of the basin slopes. Because these basins receive flows from the entire upper subwatershed, it would be anticipated that a large number of native ‘volunteer’ seedlings (from washed-in seed) would arise

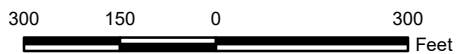


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Aerial Source: Esri, DigitalGlobe

## Habitat Enhancement Areas - Upper Area 1

## Exhibit 5



in some of the basin bottom and side slope areas; therefore, ‘passive’ restoration (with ongoing weed control) could facilitate good native vegetation coverage in the basin areas.

## 8.2 HABITAT ENHANCEMENT DEMONSTRATION AREA

Many of the tasks addressed in the HEP are expected to be performed by licensed restoration contractors under the supervision of City staff and the City’s Biological Monitor. By contrast, the City of Pasadena plans to collaborate with community volunteer groups and other interested parties to perform habitat restoration tasks at the proposed 1.9-acre Behner Restoration Sites (Sites 1, 2, and 3; as shown on Exhibit 5). The restoration sites are located along the east side of the Arroyo Seco, just north of the Behner Water Treatment Plant. The restoration sites were selected based on their current ecologically degraded conditions; the sites’ logistics (e.g., good pedestrian access; selective vehicular access; irrigation points of connection) for installation and maintenance purposes; and the absence of apparent *fatal flaws* such as contaminated soils. While there are hundreds of locations throughout the Project site that would benefit from active restoration, the size and location of the selected Behner sites allow for a high probability of short term and long term success which can be a critical component of community outreach.

The areas proposed for restoration currently include patches of native scrub vegetation along with several non-native gum trees (*Eucalyptus* sp.), non-native cactus plants, and broad patches of weedy herbs and grasses. The slopes within these sites are generally south- or west-trending, and portions of the area exhibit rocks and boulders of various sizes that provide value for wildlife species. Sites 1 through 3 occur outside a 100-foot fuel modification buffer zone estimated from the property lines of residential areas located to the east.

### 8.2.1 8.2.1 RESTORATION GOALS

The goals of the restoration project will be to (1) remove non-native vegetation; (2) increase native plant coverage and diversity (through the installation of native container plants, cuttings [e.g., cactus], and seeds); (3) provide interpretive opportunities (butterfly and hummingbird gardens; signage; guided tours, etc.) for the community to learn about the native plants that occur in the local subwatershed; (4) demonstrate the use of locally occurring native plant species for water-wise landscaping applications (Site 3 slopes); (5) improve visual aesthetics by removing unsightly weeds along the frequently used trails that traverse the proposed restoration sites; and (6) upgrade wildlife habitat values in this portion of Area 1.

### 8.2.2 PRELIMINARY ECOLOGICAL ASSESSMENT

As previously described in Section 6, biological resources protected by regulation may occur within any given portion of the Project site at any particular time. Prior to any habitat-disturbing activities, the City’s Biological Monitor will perform a site survey to identify any biological constraints which may require avoidance. Additionally, the survey will document the condition and biological values of the site along with unique features to be retained such as snags, woody debris and boulder piles that provide high wildlife value. Upon the completion of the survey and subsequent documentation, the City and the City’s Restoration Consultant will develop a site specific conceptual plan, meet with selected volunteer group and other stakeholders (e.g., the adjacent property owners to the east) to discuss the findings of the survey—i.e., the opportunities and constraints for habitat restoration activities in this location and the proposed work plan. The City and the City’s Restoration Consultant will then prepare a more detailed work plan outlining the steps of habitat restoration for the applicable restoration site. The process would be repeated for each of the 3 Behner Restoration Sites over an estimated schedule of 3 years. A similar process could be used within new sites to be identified in the future.



### 8.2.3 IMPLEMENTATION

Following is a brief discussion of site preparation, site installation, long-term maintenance, and biological monitoring tasks to be performed during restoration project implementation. The restoration activities on Sites 1 through 3 will be implemented in phases and will depend on the City's available funding (from year to year) and the size of the volunteer crews that sign-on to participate from season to season. It is recommended that photo documentation be recorded at multiple designated photo stations (and mapped using a Global Positioning System/GPS device), to visually assess the progress of the restoration effort for educational/outreach purposes.

All aspects of restoration planning and implementation will include oversight and technical input from the City's Restoration Consultant. Volunteers groups are expected to have a range of capabilities which may allow some technical aspects to be managed by trained/qualified volunteers. These opportunities will be pursued to maximize volunteer involvement at all levels of restoration where feasible. On-site technical supervision will be a component of all site activities involving volunteers.

### 8.2.4 NATIVE PLANTS AND SEEDS

The City and its partners will perform advance collection of genetically-local seeds (i.e., naturally occurring within the Arroyo Seco subwatershed, or within other nearby sites on the coastal slope [foothills] of the San Gabriel Mountains in the Los Angeles River Watershed) to be used for the propagation of container plants, and to be used for direct sowing on the sites, in consultation with the City's Restoration Consultant. Container plant materials of the desired species (in the desired sizes and quantities) shall be propagated by native plant nurseries. Existing nursery stock that is known to be genetically-local may also be used. Oak species shall be established primarily via the direct-sowing of locally-harvested acorns for best results (e.g., natural tap-root formation). The plant species to be propagated may include native trees, shrubs, vines, and herbaceous perennials. Species collected the proposed palettes described in Appendix C of the HWP Master Plan.

### 8.2.5 TRAINING

The City and its partners will conduct ongoing trainings for volunteers (and City staff as needed) to educate them on (1) the avoidance of adverse impacts to sensitive biological resources; (2) the identification of native plants to be used in the restoration efforts, and the identification of common weed species on the site; (4) the materials, tools, and methods to be used in restoration (e.g., container plant installation); and (5) safety equipment and procedures. The City's consultant will also evaluate volunteer's qualifications to determine level of qualification and recommend appropriate level of work effort suitable for individual or groups of volunteers.

### 8.2.6 SITE PREPARATION

The non-native gum trees and non-native cactus plants will be removed from the site (by a City contractor) prior to the initiation of volunteer restoration activities. The City will delineate the boundaries of the areas to be restored using appropriate posts/fences where needed, and place signage that explains the goals of the restoration program and the types of activities and equipment that will be involved. Signage will be consistent with the HWP Master Plan: Arroyo Seco Design Guidelines (Pages 6-1 to 6-4) (City of Pasadena 2003b). The City will also evaluate the availability of a water source to be used for the irrigation of container plants (e.g., on the adjacent water treatment facility). If a nearby source of line irrigation does not exist, the irrigation of container plants may be achieved by (a) placement of a temporary water tank on the site (for hand/hose irrigation) to be periodically filled by a water truck (i.e., by hose, from the paved road to the west); or (b) via a 'water buffalo'-type, vehicle-towed water tank. *Note: The trail to the south*

*of the restoration site is narrow and is not suitable for standard-width vehicle operation.* The City will evaluate and relocate if feasible, the chain link fence surrounding the Behner Water Treatment Plant to provide direct access to additional restoration areas.

The initial removal of non-native vegetation will occur outside the general nesting bird season which is defined as March 15 to August 31, to avoid adverse impacts to nesting birds. If unavoidable, work to be performed during the nesting bird season shall require a preliminary nesting bird survey performed by a qualified biologist to ensure no nesting birds are disturbed

Non-native shrubs and herbaceous species will be removed from the site using appropriate tools. Weeds shall be removed manually (i.e., hand-pulling, or using hand tools such as shovels, rakes, hoes). No herbicides shall be used. To the extent practicable, the roots of perennial weeds such as tree tobacco should be removed to avoid re-growth. All weedy brush shall be transported to an off-site green waste facility. *Note: The boulders and smaller natural rocks (as well as brick structure remnants) on the site have habitat value and shall be retained in place.* All trash shall be removed from the site; it is anticipated that a City crew will collect bagged trash for disposal.

### **8.2.7 SITE INSTALLATION**

Upon the completion of site preparation tasks, the City's Restoration Consultant will collaborate with the identified volunteer groups to determine availability of support and what portions of the restoration sites will receive planting and seeding within a given period. A list of container plant species to be installed for a given phase will be prepared, and a final planting layout will be prepared that will result in a good distribution of plantings for optimal habitat function. Planting shall be consistent with the Planting Guidelines (see Page 3-40) of the HWP Master Plan. Planting should be performed between November 1 and December 31 for best growth results; however, some native plant species can be installed at other times of year with acceptable results. Planting locations will be selected carefully to avoid encroachment on the adjacent trail by plantings *at their mature growth size*—e.g., large trees/shrubs will not be planted near the edge of the trail. Color-coded wire flags may be placed to indicate the planting locations of the various species to be installed. Native plants should be loaded/unloaded and transported carefully to avoid undue damage. Deeply-dug planting holes of suitable depth/width should be prepared to facilitate proper root establishment, and the plants should be installed at the right height—i.e., with the 'crown' slightly higher than the ground level. No fertilizers or other chemicals shall be used. Watering basins should be formed around each plant to enable the application of an adequate volume of water per irrigation event, and the plants should be well watered-in at the time of installation. For some container plant species, it may be suitable to install a weed-free, natural mulch within the planting basins to improve plant growth/survival. It will be beneficial to create a 'mosaic' of vegetation on the site, to include not only native trees and shrubs, but also to create patches with only native grasses and herbs, to optimize the biodiversity (e.g., pollinator resources) and the aesthetics of the site as viewed from the trail. Wooden stakes can be used to delineate curvilinear/naturalistic polygons that will be maintained as patches of native herbaceous cover.

The seed of select species will be applied to the site in the fall—preferably just prior to the first substantial rain event of the season (typically in November/December). It is recommended that tree and shrub species be installed via container plantings (only), and that native grasses and herbs (only) be applied via seedling, to achieve the habitat 'mosaic' described above.

Additional habitat features to enhance wildlife opportunities, such as blue bird or owl nesting boxes may be added to the site if determined appropriate and feasible within the site work plan.

### **8.2.8 LONG TERM MAINTENANCE**

Upon the completion of planting and seeding activities, long-term maintenance will be required to ensure plant survival and to avoid weed proliferation on the restoration site. An adaptive management approach should be implemented, wherein plants are provided with infrequent, deep (and temporary) irrigation on a reducing schedule to encourage deep-rooting and drought-hardiness. Weeds should be removed from the site on a regular schedule. *Note: Weed species should be removed prior to seed set/dispersal, to avoid ongoing re-infestation of the site by weeds.* Weeds should be removed in a manner that protects native plants and seedlings, including native 'volunteer' plant species (i.e., not deliberately planted or seeded) that naturally arise on the site. Maintenance activities will be implemented in a manner to avoid indented biological constraints as discussed in Section 6.0 above.

### **8.2.9 LONG-TERM MONITORING**

The City's Restoration Ecologist will periodically inspect the restoration site to assess overall habitat conditions and to develop lists of recommended maintenance action items (e.g., supplemental planting and seedling) to be implemented by the City and volunteer groups. Additionally, volunteer groups will be encouraged and provided with a methodology to regularly record wildlife use of the site to allow for comparison with pre-project wildlife use.

### **8.3 AREA 2 ('RIPARIAN CORRIDOR') AND AREA 3 ('EAST OF SUBSTATION')**

Active restoration tasks in Area 2 and Area 3 are expected to be limited, consisting mainly of the application (hand broadcasting) of native herbaceous seed mixes along roads, trails, and picnic areas, in patches where non-native plant species have been removed. Seeds should be applied in the autumn (October/November) and scratched into the soil surface using heavy metal rakes. No irrigation will be required for the areas where seed is applied (it will become established on rainfall, only). As noted above, all seed applied to the Project area should be genetically local.

### **8.4 AREA 4 ('NORTHERN MOUNTAIN SLOPES')**

No active restoration tasks are proposed to occur in Area 4.

## **9.0 FENCING AND INTERPRETIVE SIGNAGE**

Successful habitat enhancement programs often incorporate components to prevent or deter human access to enhanced/restored areas, interpretive signage describing the purpose of the Project and explaining how avoidance of some areas will assist in the process may be placed in strategic location to maximize observance. Such signage is also very helpful in making the local community aware, interested, and supportive of habitat enhancement projects. Based on observations of existing trail use and proposed restoration efforts, it is recommended that the City consider installation of signage at the Behner Restoration Sites in a position where trail users on the Hahamongna Trail would easily be able to see it particularly from a northward moving direction as well as trails users access the site from the east. Two sign locations may be required to accomplish this goal. Signage is also recommended at strategic vantage points along the Hahamongna Trail and the east side of the perimeter trail where a west facing vantage point provides a view of the basins and the associated recommended sycamore planting areas and the future restoration/enhancement areas, Subsequent to initial years of non-native removal program, it is expected that additional areas which respond quickly with extensive native reestablishment and offer trail users a good vantage point and signage may be consider appropriate at that time. All permanent signage would be consistent with the HWP Master Plan: Arroyo Seco Design Guidelines (Pages 6-1 to 6-4).

Fencing is not likely to be an option for most areas due to the large area of enhancement. However, there may be specific locations identified in the future that are more sensitive to trampling and would benefit substantially from fencing. On a case by case basis, fencing may be temporarily utilized where appropriate to achieve plan goals. An additional option to restricting or deterring access to area involves the use of local materials such as river rock (boulders) and large woody debris such as logs. These materials can be strategically placed at the entrance of unauthorized paths to reduce and redirect users. Most of the evidence of trail usage observed during field surveys was within established trails. However, patterns of usage often change overtime in response to high water flow or trail closure or projects that alter existing trail alignments. One area which exhibit signs of un-approved trail branching is located immediately north east of the JPL Bridge. However, it is unclear if legitimate equestrian trail requirements have resulted in the trail branching or if they are simply “short cut” advantages in an area which is highly traversed. It is recommended that the area, and watershed in general, is annually monitored and recommendation made if deemed appropriate for placing usage deterrent/barrier materials to redirect users onto approved and established trails.

## **10.0 WILDLIFE ENHANCEMENTS**

A number of artificial features can be added in strategic locations to provide wildlife habitat opportunities where they are currently lacking or diminished. The goal of these features is to bring native wildlife into the enhanced habitat areas to restore the local ecology which improves long term habitat persistence. Bird nest boxes for blue birds and/or owls and bat boxes can be easily installed at low costs and are highly successful in most scenarios. These features often receive high public interest and provide another opportunity for volunteer involvement. Area 1 is best suited for these enhancements. It is recommended that simultaneous with implantation of the proposed sycamore planting activities and the Behner sites restoration, the City' Restoration Consultant identify and install up to five pole mounted blue bird boxes with City approval and provide recommendations at that time for potential additional features/locations if deemed appropriate.

## **11.0 STAKEHOLDER COORDINATION**

The City of Pasadena assisted by the Restoration Consultant as appropriate will coordinate with community partners including the ANF, Jet Propulsion Laboratory, the Arroyo Seco Foundation, and other local civic/environmental organizations on the implementation of the HEP, and on collaborative efforts to improve local habitat values and educational/interpretive values across the subwatershed. In particular, the City will coordinate with the ANF on a plan to control invasive weed species throughout upper Arroyo Seco Canyon; ideally, this will include a ‘headwaters-down’ approach to the elimination of invasive species, to reduce the re-infestation of downstream habitats by upstream sources of weed seeds.

The City with support from the Consultant, will develop a public outreach program and coordinate with community organizations seeking to perform volunteer ecological and recreational improvement activities (weed control; trails enhancement/repair; planting/seeding, etc.) in the Project area, to ensure that such activities are conducted safely and in a manner that does not inadvertently harm native habitats or species. The outreach program shall generally be designed to inform project area neighbors, stake holders, and other interested parties of the HEP goals, their importance, and how all interested individuals or groups can contribute to the effort. Methods of vegetation maintenance and appropriate landscaping methods (for the urban/wildland interface) on adjacent properties and encouragement/opportunities for involvement shall be presented through communications such as the City website, public meetings, flyers, signage, a mobile app for reporting issues, and events such as weekend hikes/talks sponsored by the City. The program should be continually modified dependent on results of previous outreach efforts and feedback from the community and upcoming needs of the Project.

## **12.0 IMPLEMENTATION APPROACH**

Implementation of this HEP shall require a phased approach to account for the different components and variation in goals and required/recommended schedule. While some components, such as the City vegetation maintenance with FMZ areas, require annual actions where as other activities such as non-native tree removals have greater flexibility for scheduling. Furthermore, as described in Section 7 above, the most effective approach to watershed weed control is typically from top to bottom as water-borne seeds can re-infest downstream habitat areas and wind-borne seeds can more readily move downslope (than upslope). By eliminating sources of weed seeds in upstream and upslope areas, the re-infestation of habitats can be reduced from year to year, along with associated effort and cost to achieve project objectives. Therefore, the proposed approach prioritize the removal of upstream/upslope vegetation. The large size of the Project site was also considered and the approach reflects an attempt to divide components into annual efforts manageable for Contractor, the City’s Restoration Consultant, and the City’s contract oversight. Lastly, the proposed schedule was designed to allow time for development of support from the public and volunteer groups and other stakeholders. Appendix B includes a Proposed Element Activity Phasing Schedule with proposed time frames for various components of the HEP along with roles and responsibilities for each. Initiation of the plan is proposed to begin immediately, fiscal year 2020, and continue through fiscal year 2023. However, it is expected that many components would continue in perpetuity beyond 2023.

Implementation of many components will require some additional details to be prepared just prior to initiating work. It is anticipated that these more detailed planning effort would be summarized in site-specific Work Plans covering activities within a specific time frame of one year or less.

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## 14.0 **GLOSSARY**

ASCP	Arroyo Seco Canyon Project
AFC	Arroyo and Foothills Conservancy
ANFLMP	Angeles National Forest Land Management Plan
CDFW	California Fish and Wildlife (formerly California Fish and Game)
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CRPR	California Rare Plant Rank
CWA	Clean Water Act
FESA	Federal Endangered Species Act
FMZ	Fuel Modification Zone
HEP	Habitat Enhancement Plan
HWP	Hahamongna Watershed Park
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
RPZ	Root Protection Zone
RWQCB	Regional Water Quality Control Board
SWRCB	California State Water Resources Control Board
UFAC	Urban Forestry Advisory Committee
USACE	United State Army Corps of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WMA	Weed Management Areas



**APPENDIX A**  
**SPECIFICATIONS**

**BIDDER'S PROPOSAL**

AREA 1					
Item No.	Item Description	Unit	Estimated Quantity	Unit Price (In Figures) Dollars/Cents	Item Total (In Figures) Dollars/Cents
1.01	Remove blue gum ( <i>Eucalyptus globulus</i> ) #134	EA	1		
1.02	Remove blue gum ( <i>Eucalyptus globulus</i> ) #140	EA	1		
1.03	Remove blue gum ( <i>Eucalyptus globulus</i> ) #141	EA	1		
1.04	Remove blue gum ( <i>Eucalyptus globulus</i> ) #142	EA	1		
1.05	Remove blue gum ( <i>Eucalyptus globulus</i> ) #143	EA	1		
1.06	Remove blue gum ( <i>Eucalyptus globulus</i> ) #145	EA	1		
1.07	Remove blue gum ( <i>Eucalyptus globulus</i> ) #146	EA	1		
1.08	Remove blue gum ( <i>Eucalyptus globulus</i> ) #147	EA	1		
1.09	Remove Peruvian pepper ( <i>Schinus molle</i> ) #148	EA	1		
1.10	Remove blue gum ( <i>Eucalyptus globulus</i> ) #149	EA	1		
1.11	Remove blue gum ( <i>Eucalyptus globulus</i> ) #150	EA	1		
1.12	Remove blue gum ( <i>Eucalyptus globulus</i> ) #151	EA	1		
1.13	Remove blue gum ( <i>Eucalyptus globulus</i> ) #152	EA	1		
1.14	Remove blue gum ( <i>Eucalyptus globulus</i> ) #153	EA	1		
1.15	Remove blue gum ( <i>Eucalyptus globulus</i> ) #154	EA	1		
1.16	Remove blue gum ( <i>Eucalyptus globulus</i> ) #155	EA	1		
1.17	Remove blue gum ( <i>Eucalyptus globulus</i> ) #156	EA	1		
1.18	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #157	EA	1		
1.19	Remove cajeput tree ( <i>Melaleuca sp.</i> ) #158	EA	1		
1.20	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #159	EA	1		
1.21	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #160	EA	1		
1.22	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #161	EA	1		
1.23	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #162	EA	1		
1.24	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #163	EA	1		
1.25	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #164	EA	1		
1.26	Remove loquat ( <i>Eriobotrya japonica</i> ) #165	EA	1		
1.27	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #166	EA	1		
1.28	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #167	EA	1		
1.29	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #168	EA	1		
1.30	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #169	EA	1		
1.31	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #170	EA	1		
1.32	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #171	EA	1		
1.33	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #172	EA	1		
1.34	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #173	EA	1		
1.35	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #174	EA	1		

**BIDDER'S PROPOSAL**

AREA 1					
Item No.	Item Description	Unit	Estimated Quantity	Unit Price (In Figures) Dollars/Cents	Item Total (In Figures) Dollars/Cents
1.36	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #175	EA	1		
1.37	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #176	EA	1		
1.38	Remove tree of heaven ( <i>Ailanthus altissima</i> ) #177	EA	1		
1.39	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #178	EA	1		
1.40	Remove Canary Island pine ( <i>Pinus canariensis</i> ) polygon #179 (20 trees)	EA	1		
1.41	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #180	EA	1		
1.42	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #181	EA	1		
1.43	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #182	EA	1		
1.44	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #183	EA	1		
1.45	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #184	EA	1		
1.46	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #185	EA	1		
1.47	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #186	EA	1		
1.48	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #187	EA	1		
1.49	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #188	EA	1		
1.50	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #189	EA	1		
1.51	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #190	EA	1		
1.52	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #191	EA	1		
1.53	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #192	EA	1		
1.54	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #193	EA	1		
1.55	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #194	EA	1		
1.56	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #196	EA	1		
1.57	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #199	EA	1		
1.58	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #200	EA	1		
1.59	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #200	EA	1		
1.60	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #201	EA	1		

**BIDDER'S PROPOSAL**

AREA 1					
Item No.	Item Description	Unit	Estimated Quantity	Unit Price (In Figures) Dollars/Cents	Item Total (In Figures) Dollars/Cents
1.61	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #202	EA	1		
1.62	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #203	EA	1		
1.63	Remove sugar gum ( <i>Eucalyptus cladocalyx</i> ) #204	EA	1		
1.64	Remove (one time) non-native shrubs and herbaceous vegetation at Location #'s 131-133; 135-139; 144; 148; 195; and 197-198, as described in Table A-1 and shown on Exhibit 3.	LS	1		
1.65	Furnish and install 15-gallon western sycamore trees ( <i>Platanus racemosa</i> ). <ul style="list-style-type: none"> <li>To be acquired <u>only</u> from Tree of Life Nursery in San Juan Capistrano, CA.</li> <li>Trees to be selected/tagged in advance at nursery by City's Biologist.</li> <li>Installation shall <u>only</u> occur in the months of February or March.</li> </ul>	EA	50		
1.66	Furnish and install a weed-free and pest-free, natural mulch within the planting basins to a depth of 3" to 4"	LS	50		
1.67	Perform one (1) year of maintenance of fifty (50), 15-gallon western sycamore trees after installation: <ul style="list-style-type: none"> <li>Irrigation via <i>low-force</i> hose application from water truck (or 'water buffalo'), 1x every one (1) week for the first six (6) months, and 1x every two (2) weeks, for the second six (6) months.</li> <li>Irrigation cost shall include operator, truck, and cost of water.</li> <li>The amount of water to be applied to each western sycamore tree every 2 weeks shall not be less than 50 gallons per event, <u>without overflowing the planting basin</u>.</li> <li>1x per month maintenance of irrigation basins (re-shaping; weed removal).</li> <li>City to provide metered water source.</li> </ul>	LS	1 Year		

**BIDDER'S PROPOSAL**

AREA 2					
Item No.	Item Description	Unit	Estimated Quantity	Unit Price (In Figures) Dollars/Cents	Item Total (In Figures) Dollars/Cents
2.01	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #95	EA	1		
2.02	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #96	EA	1		
2.03	Remove blue gum ( <i>Eucalyptus globulus</i> ) #99	EA	1		
2.04	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #102	EA	1		
2.05	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #106	EA	1		
2.06	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #107	EA	1		
2.07	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #108	EA	1		
2.08	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #109	EA	1		
2.09	Remove common fig ( <i>Ficus carica</i> ) #112	EA	1		
2.10	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #113	EA	1		
2.11	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #113	EA	1		
2.12	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #113	EA	1		
2.13	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #113	EA	1		
2.14	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #113	EA	1		
2.15	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #114	EA	1		
2.16	Remove Canary Island pine ( <i>Pinus canariensis</i> ) #114	EA	1		
2.17	Remove Siberian elm ( <i>Ulmus pumila</i> ) #115	EA	1		
2.18	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.19	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.20	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.21	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.22	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.23	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.24	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #116	EA	1		
2.25	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #120	EA	1		
2.26	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #121	EA	1		
2.27	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #122	EA	1		
2.28	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #123	EA	1		
2.29	Remove Aleppo pine ( <i>Pinus halapensis</i> ) #124	EA	1		
2.30	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #125	EA	1		
2.31	Remove Shamel ash ( <i>Fraxinus uhdei</i> ) #126	EA	1		
2.32	Remove Mexican fan palm ( <i>Washingtonia robusta</i> ) #127	EA	1		
2.33	Remove Mexican fan palm ( <i>Washingtonia robusta</i> ) #128	EA	1		
2.34	Remove Chinese elm ( <i>Ulmus parviflora</i> ) #129	EA	1		
2.35	Remove (one time) non-native shrubs and herbaceous vegetation at Location #'s 93-94; 97-98; 100-101; 103-105; 110-111; 117-119; and 130, as described in Table A-1, and shown on Exhibit 3.	LS	1		

**BIDDER'S PROPOSAL**

AREA 3					
Item No.	Item Description	Unit	Estimated Quantity	Unit Price (In Figures) Dollars/Cents	Item Total (In Figures) Dollars/Cents
3.01	Remove (one time) non-native shrubs and herbaceous vegetation at Location #'s 85-92, as described in Table A-1, and shown on Exhibit 3.	LS	1		

AREA 4					
Item No.	Item Description	Unit	Estimated Quantity	Unit Price (In Figures) Dollars/Cents	Item Total (In Figures) Dollars/Cents
4.01	Remove (one time) non-native shrubs and herbaceous vegetation at Location #'s 1-84, as described in Table A-1, and shown on Exhibit 3.	LS	1		

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

Weed <sup>a</sup> Location No.	Point or Polygon	Common Name	Count <sup>b</sup>	Common Name	Count <sup>b</sup>	Common Name	Count <sup>b</sup>	Logistics
1	Polygon	Spanish broom	30					Highway 2
2	Polygon	Spanish broom	50	tree tobacco	5			Highway 2
3	Polygon	smilo grass	x	castor bean	6			Highway 2
4	Polygon	Spanish broom	20	tree tobacco	10			Highway 2
5	Polygon	Spanish broom	12	castor bean	12	tree tobacco	5	Highway 2
6	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
7	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
8	Polygon	Spanish broom	200					Mt. Lukens Rd, requires gate key
9	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
10	Point	Spanish broom	1	smilo grass	x			Mt. Lukens Rd, requires gate key
11	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
12	Point	Spanish broom	1	smilo grass	x			Mt. Lukens Rd, requires gate key
13	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
14	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
15	Polygon	Spanish broom	250					Mt. Lukens Rd, requires gate key
16	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
17	Polygon	Spanish broom	50					Mt. Lukens Rd, requires gate key
18	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
19	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
20	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
21	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
22	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
23	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
24	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
25	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
26	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
27	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
28	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
29	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
30	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
31	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
32	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

<b>Weed<sup>a</sup> Location No.</b>	<b>Point or Polygon</b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Logistics</b>
33	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
34	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
35	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
36	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
37	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
38	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
39	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
40	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
41	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
42	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
43	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
44	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
45	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
46	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
47	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
48	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
49	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
50	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
51	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
52	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
53	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
54	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
55	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
56	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
57	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
58	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
59	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
60	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
61	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
62	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
63	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
64	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key



**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

<b>Weed<sup>a</sup> Location No.</b>	<b>Point or Polygon</b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Logistics</b>
65	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
66	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
67	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
68	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
69	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
70	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
71	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
72	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
73	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
74	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
75	Point	tree tobacco	1					Mt. Lukens Rd, requires gate key
76	Point	tree tobacco	2					Mt. Lukens Rd, requires gate key
77	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
78	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
79	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
80	Point	Spanish broom	3					Mt. Lukens Rd, requires gate key
81	Point	Spanish broom	1					Mt. Lukens Rd, requires gate key
82	Point	Spanish broom	3					Mt. Lukens Rd, requires gate key
83	Point	Spanish broom	4					Mt. Lukens Rd, requires gate key
84	Polygon	tree tobacco	12					Highway 2
85	Point	Spanish broom	30					Gould Substation, requires gate key
86	Point	Spanish broom	1					Gould Substation, requires gate key
87	Point	Spanish broom	1					Gould Substation, requires gate key
88	Point	tree tobacco	1					Gould Substation, requires gate key
89	Point	Spanish broom	1					Gould Substation, requires gate key
90	Point	Spanish broom	3					Gould Substation, requires gate key
91	Point	Spanish broom	2					Gould Substation, requires gate key
92	Point	tree tobacco	1					Gould Substation, requires gate key
93	Polygon	Ivy (German/English)	x	periwinkle	x			Arroyo Seco Rd, requires gate key
94	Point	non-native grassland						Arroyo Seco Rd, requires gate key
95	Point	Aleppo pine	1					Arroyo Seco Rd, requires gate key
96	Point	Canary Island pine	1					Arroyo Seco Rd, requires gate key

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

Weed <sup>a</sup> Location No.	Point or Polygon	Common Name	Count <sup>b</sup>	Common Name	Count <sup>b</sup>	Common Name	Count <sup>b</sup>	Logistics
97	Point	Spanish broom	5					Arroyo Seco Rd, requires gate key
98	Point	Spanish broom	1					Arroyo Seco Rd, requires gate key
99	Point	blue gum eucalyptus	1					Arroyo Seco Rd, requires gate key
100	Point	castor bean	6					Arroyo Seco Rd, requires gate key
101	Point	non-native grassland	x	castor bean	2			Arroyo Seco Rd, requires gate key
102	Point	Chinese elm	1					Arroyo Seco Rd, requires gate key
103	Polygon	periwinkle	x					Arroyo Seco Rd, requires gate key
104	Point	ivy (German/English)	x					Arroyo Seco Rd, requires gate key
105	Point	tree tobacco	1					Arroyo Seco Rd, requires gate key
106	Point	Chinese elm	1					Arroyo Seco Rd, requires gate key
107	Point	Chinese elm	1					Arroyo Seco Rd, requires gate key
108	Point	Canary Island pine	1					Arroyo Seco Rd, requires gate key
109	Point	Chinese elm	1					Arroyo Seco Rd, requires gate key
110	Polygon	ivy	x	periwinkle	x			Arroyo Seco Rd, requires gate key
111	Point	tree tobacco	2					Arroyo Seco Rd, requires gate key
112	Point	common fig	1					Arroyo Seco Rd, requires gate key
113	Point	Chinese elm	5					Arroyo Seco Rd, requires gate key
114	Point	Aleppo pine	1	Canary Island pine	1			Arroyo Seco Rd, requires gate key
115	Point	Siberian elm	1	castor bean	1			Arroyo Seco Rd, requires gate key
116	Point	Chinese elm	7					Arroyo Seco Rd, requires gate key
117	Point	tree tobacco	1					Arroyo Seco Rd, requires gate key
118	Point	castor bean	1					Arroyo Seco Rd, requires gate key
119	Point	Spanish broom	10					Arroyo Seco Rd, requires gate key
120	Point	Aleppo pine	1					Arroyo Seco Rd, requires gate key
121	Point	Aleppo pine	1	periwinkle	x	ivy (German/Englis h)	x	Arroyo Seco Rd, requires gate key
122	Point	Aleppo pine	1	periwinkle	x	ivy (German/Englis h)	x	Arroyo Seco Rd, requires gate key
123	Point	Aleppo pine	1	periwinkle	x	ivy (German/Englis h)	x	Arroyo Seco Rd, requires gate key

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

Weed <sup>a</sup> Location No.	Point or Polygon	Common Name	Count <sup>b</sup>	Common Name	Count <sup>b</sup>	Common Name	Count <sup>b</sup>	Logistics
124	Point	Aleppo pine	1	periwinkle	x	ivy (German/English)	x	Arroyo Seco Rd, requires gate key
125	Point	Chinese elm	2					Arroyo Seco Rd, requires gate key
126	Point	shamel ash	1					Arroyo Seco Rd, requires gate key
127	Point	Mexican fan palm	1					Arroyo Seco Rd, requires gate key
128	Point	Washingtonia sapling	1					Arroyo Seco Rd, requires gate key
129	Point	Chinese elm	1					Arroyo Seco Rd, requires gate key
130	Point	castor bean	3					Arroyo Seco Rd, requires gate key
131	Point	tree tobacco	1					JPL parking lot, adjacent on slope
132	Point	castor bean	1					JPL parking lot, adjacent on slope
133	Point	castor bean	5					JPL parking lot, adjacent on slope
134	Point	blue gum eucalyptus	1					Arroyo Seco Rd, requires gate key
135	Point	mission cactus	x					JPL parking lot, adjacent on slope
136	Point	castor bean	10					JPL parking lot, adjacent on slope
137	Point	castor bean	5	tree tobacco	4			JPL parking lot, adjacent on slope
138	Point	castor bean	1					JPL parking lot, adjacent on slope
139	Point	mission cactus	x					JPL parking lot, adjacent on slope
140	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
141	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
142	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
143	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
144	Point	tree tobacco	1					Spreading basins located south of JPL access
145	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
146	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
147	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

<b>Weed<sup>a</sup> Location No.</b>	<b>Point or Polygon</b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Logistics</b>
148	Point	Peruvian pepper	1					Spreading basins located south of JPL access
149	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
150	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
151	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
152	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
153	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
154	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
155	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
156	Point	blue gum eucalyptus	1					Spreading basins located south of JPL access
157	Point	Canary Island pine	1					Behind City of Pasadena facility fence
158	Point	cajeput tree	1					Behind City of Pasadena facility fence
159	Point	Chinese elm	1					Behind City of Pasadena facility fence
160	Point	Canary Island pine	1					Behind City of Pasadena facility fence
161	Point	Canary Island pine	1					Behind City of Pasadena facility fence
162	Point	Chinese elm	1					Behind City of Pasadena facility fence
163	Point	Canary Island pine	1					Behind City of Pasadena facility fence
164	Point	Aleppo pine	1					Behind City of Pasadena facility fence
165	Point	loquat	1					Behind City of Pasadena facility fence
166	Point	Canary Island pine	1					Behind City of Pasadena facility fence
167	Point	Canary Island pine	1					Behind City of Pasadena facility fence
168	Point	Aleppo pine	1					Behind City of Pasadena facility fence
169	Point	sugar gum	1					Behind City of Pasadena facility fence
170	Point	Canary Island pine	1					Behind City of Pasadena facility fence
171	Point	sugar gum	1					Behind City of Pasadena facility fence

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

<b>Weed<sup>a</sup> Location No.</b>	<b>Point or Polygon</b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Logistics</b>
172	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
173	Point	Chinese elm	1					Behind City of Pasadena facility fence
174	Point	Chinese elm	1					Behind City of Pasadena facility fence
175	Point	Canary Island pine	1					Behind City of Pasadena facility fence
176	Point	Canary Island pine	1					Behind City of Pasadena facility fence
177	Point	tree of heaven	1					Behind City of Pasadena facility fence
178	Point	Canary Island pine	1					Behind City of Pasadena facility fence
179	Polygon	black locust	20					Polygon of ~20 individuals behind City of Pasadena facility fence*
180	Point	sugar gum	1					Behind City of Pasadena facility fence
181	Point	Aleppo pine	1					Arroyo Seco Rd, requires gate key
183	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
184	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
185	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
186	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
187	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
188	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
189	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
190	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
191	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
192	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
193	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
194	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
195	Point	mission cactus	1					Arroyo Seco Rd, requires gate key
196	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
197	Point	mission cactus	1					Arroyo Seco Rd, requires gate key
198	Point	mission cactus	1					Arroyo Seco Rd, requires gate key
199	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
200	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
201	Point	sugar gum	1					Arroyo Seco Rd, requires gate key

**TABLE A-1  
NON-NATIVE REMOVALS MATRIX**

<b>Weed<sup>a</sup> Location No.</b>	<b>Point or Polygon</b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Common Name</b>	<b>Count<sup>b</sup></b>	<b>Logistics</b>
202	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
203	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
204	Point	sugar gum	1					Arroyo Seco Rd, requires gate key
<sup>a</sup> Corresponds with locations depicted in Exhibit 3. <sup>b</sup> Species with "X" (smilo grass, periwinkle, ivy, etc.) were unable to be accurately counted due to their colonial and/or clumping growth habit.								

**...x-xx.xx** Registration and Qualifications of Contractors - Before submitting bids, Contractors shall be licensed in accordance with the Business and Professions Code Section 7000 et. seq. and each Contractor shall insert his license number on the Bidder's Proposal.

Contractor shall possess a current State of California C27-Landscaping License and shall be experienced in the performance of native habitat enhancement and restoration in sensitive biological areas. Specifically, the Contractor must provide documentation of the successful installation and completion of long-term maintenance of a minimum of two (2) southern California native habitat mitigation/restoration programs of minimum ten (10) acres in size that included both eradication of non-native vegetation (including removal of trees) and native plant species establishment. A successful program shall be defined as one that was implemented under natural resource agency permit conditions (e.g., the U.S. Army Corps of Engineers - Section 404 permit; California Department of Fish and Game – Streambed Alteration Agreement; Regional Water Quality Control Board – Section 401 permit) and was signed-off/approved by the relevant resource agency/agencies. It is important to note that this work will be implemented in an ecologically sensitive, existing native habitat area. Contractors that do not provide detailed, verifiable documentation of native habitat restoration experience as described above may not be considered qualified for this project.

Prior to award of a contract, the City may request of any Bidder, a statement setting forth their work experience as described above. Such statement shall describe the work performed over the period of three (3) years preceding the date of said statement, and shall give the owner, location, and contract price, together with the dates of beginning and completion of such work. This statement of experience shall be submitted within seven (7) calendar days after the City's notification to so submit. Failure to submit an adequate statement can result in rejection of the bid as non-responsive...

## ...PART II

### **SPECIAL PROVISIONS - SPECIFIC FOR THIS PROJECT**

#### **II-1.01 Scope of Work**

The Project site consists of four adjoining Enhancement Areas. The contracting tasks to be performed in each Enhancement Area are described below.

The construction work to be performed includes the installation of new planting material. Work to be performed shall include, but is not limited to: provide all labor, materials (including 15-gallon western sycamores), methods, processes, tools, implements, machinery and transportation, temporary power which are necessary and required to complete the project as described in the Construction Plans and the Standard Specifications, except as modified and supplemented below, as directed by the Engineer, and as specified herein.

All other code compliance requirements necessary to complete this scope of work not mentioned herein which are required by the Plans, City of Pasadena Standard Specifications, or these bid Specifications, shall be performed, placed, constructed, or installed, and the total bid price submitted shall include the cost of all such incidentals even though they are not specifically mentioned in the preceding description of work or in the Bidder's Proposal.

Demolition shall include the removal and off-site disposal of non-native trees, and the removal and treatment of existing non-native vegetation (non-native shrubs and non-native herbaceous vegetation) on the Habitat Enhancement Area (hereinafter the Project Site).

**x-xx.xx Protection of Trees** - All California native tree species, and select non-native landscape trees, at this Project Site are to be protected and remain in place. Contractor shall refer to the city's Tree Protection Ordinance and Tree Protection Guidelines for any work in which a public tree is on or adjacent to the Project Site. The City's Tree Protection Ordinance is available online at:

[http://www.cityofpasadena.net/PublicWorks/Tree Protection Guidelines/](http://www.cityofpasadena.net/PublicWorks/Tree%20Protection%20Guidelines/)  
[http://www.cityofpasadena.net/PublicWorks/Tree Protection Ordinance Summary/](http://www.cityofpasadena.net/PublicWorks/Tree%20Protection%20Ordinance%20Summary/)

- A. A Root Protection Zone shall be maintained around all trees. The Root Protection Zone shall be located at the drip line of the trees, or 15 feet from the trunk, whichever method defines a larger area.
- B. The contractor shall acknowledge and not work within this zone, except for the installation of irrigation components or native plant materials. At no time shall any vehicles, fill or debris be allowed within the prescribed root protection zone.
- C. If any work is required within the Root Protection Zone of a California native tree species or select non-native landscape tree, it should be accomplished with hand tools, except for the installation of irrigation components or the creation of planting holes. Any trenching should be routed in such a manner as to minimize root damage to public trees. Trenching lines shall not separate more than 25 percent of the area within the root protection zone from the tree. If trenching would result in such an impact to the Root Protection Zone, the line shall be located by establishing an alternate route for the trench.
- D. Cutting of roots shall be avoided to the greatest extent possible. No roots larger than TWO INCHES shall be cut. All smaller roots that must be cut shall be clean cut (no chain saws or trenchers) flush with the sides of the trench and the trench covered immediately to avoid drying out of cut roots. Saws or pruning shears used to cut roots shall be disinfected by washing with a 70 percent alcohol solution to prevent transference of harmful pathogens.
- E. It is recognized that failure to abide by these provisions may result in substantial damage to the tree that may not be immediately apparent. The City will, therefore, assess the value of damages in accordance with the city's Tree Protection Ordinance, and a deduction shall be made from the Contractor's payments based on this assessment.
- F. The Contractor shall consult with the City's Certified Arborist prior to the performance of trenching or other soil disturbing activities to be conducted within the Root Protection Zone of all trees.
- G. Contractor may not prune or remove any city tree. If pruning of a City tree is required to provide sufficient clearance to accomplish this project, contractor shall contact city representative to request such pruning. Extent and necessity of pruning to be determined by city representative and conducted by city crews or by contractor upon approval by city representative.

**x-xx.xx Protection of Biological Resources**

- A. Prior to the start of site work, the City's Biological Monitor will conduct a training session for Contractor staff to indicate any sensitive habitat areas or other ecological resources to be protected during project implementation. If the Contractor causes damage to the habitat area (e.g., vehicle encroachment), the Contractor must report the damage to the City's representative within 24 hours, and the damage will be inspected and documented by the City's Biological Monitor within 1 week. The City will determine appropriate remedial



measures for any damage to habitat areas. The timely completion of remedial measures will be the sole responsibility of the Contractor at no expense to the City.

#### **x-xx.xx Demolition and Site Clearance**

- B. General: Provide all labor, materials, equipment, transportation and service necessary to complete the demolition and disposal of existing improvements as described in these specifications and as necessary for the construction of the improvements shown on the plans, per provisions of Section 300-1 of the Standard Specifications, except as modified and supplemented below as directed by the Engineer and as herein specified. Demolition work shall consist of the following;
1. Removal and disposal of select non-native trees.
  2. Removal and disposal of non-native shrubs and non-native herbaceous vegetation, as described in **Section x-xx.xx** of specifications, rubbish, and man-made debris.
- C. Demolition Execution:

All demolished materials shall be removed from the site and disposed of legally. Refer to Part 1, Section I-3.13 of the specifications for the City of Pasadena Recycling Requirements. The contractor shall be responsible for meeting the recycling requirements.

Existing trees that are to be protected in place shall not be pruned. They shall be barricaded and protected during demolition and site clearing work in accordance with **Section x-xx.xx** of these Specifications.

Remove non-native vegetation (non-native shrubs and non-native herbaceous vegetation), as described in **Section x-xx.xx** of the specifications. All natural rock and native woody debris is to remain on site. Rocks uncovered due to planting shall be placed on the surface to mimic natural configurations, as directed by City's Biological Monitor. Collect and dispose of trash, man-made debris and unsightly objects.

#### **x-xx.xx Non-Native Trees Removal**

- A. General: The Contractor shall remove a total of 54 non-native trees, as shown on the project plans and summarized in Table A-2.
1. Non-native trees shall be removed in a manner consistent with industry practice, with the primary emphasis on the safety of the public and the protection of utilities (overhead and underground), structures, other property, and biological resources. As needed to maintain safe conditions, temporary traffic cones, construction fencing, and/or caution tape may be used to delineate no-entry areas during tree removal activities, in consultation with the City representative.
  2. All non-native logs and debris shall be chipped to less than (1) one-inch diameter (to kill any potential shot hole borers that may be living in the wood), and legally disposed of offsite at an appropriate green waste facility. The legal disposal of all non-native materials shall be Contractor's responsibility.
  3. All non-native wood, debris and excess mulch resulting from removal activities shall be removed and the surrounding area shall be raked and/or swept clean.
  4. Special emphasis shall be placed upon public safety adjacent to roadways, hiking trails

and parking lots and protection of biological resources. Trees shall be felled and removed in such a manner to avoid impacts to surface flows and native vegetation as much as possible.

5. All trees to be removed shall be cut flush to the ground to prevent tripping. Stump grinding shall be performed, where access is possible, as needed to result in safe post-removal conditions. Immediately after cutting (i.e., within 2 minutes) all cut stumps shall be treated with an herbicide that is approved by the U.S. Environmental Protection Agency (USEPA) for application in wetland habitat areas (e.g., Roundup Custom®) if the City provides prior approval. Herbicides shall be judiciously and carefully applied in a manner that avoids spillage, and shall not be applied or spilled into any surface waters. In the event that a non-native tree stump is located in immediate proximity to surface waters, the City's Biological Monitor shall indicate non-application of herbicide to these stumps on a case-by-case basis to avoid spillage into surface waters. A perimeter of 4-foot-high lath and flagging with caution tape shall be established at a minimum 5-foot radius from the outer edge of any stump that has been treated with herbicide.
6. Adjacent native trees and other vegetation, and other sensitive biological resources shall be staked, flagged, or otherwise identified in the field for protection by the City's Biological Monitor and shall be protected in place by the Contractor.
7. The City's Biological Monitor shall provide final direction on removal and transport methods with respect to access and adjacent biological resources. The Contractor shall not place any soil, debris, equipment or plant material into any drainages on the site in a manner that obstructs normal stream flows.

**TABLE A-2  
NON-NATIVE TREES TO BE REMOVED**

Tree Number	Tree Species		Number of Trunks	DBH (inches)	Height (ft)	Canopy (ft)	ISA Condition	Health Rating	Reason for Removal	
	Common Name	Scientific Name							Condition-based	Non-Condition-Based
95	Aleppo pine	<i>Pinus halepensis</i>	1	20	35	15	4	4		X
96	Canary Island pine	<i>Pinus canariensis</i>	1	12	20	20	4	4		X
99	blue gum	<i>Eucalyptus globulus</i>	1	75	60	30	4	4		X
102	Chinese elm	<i>Ulmus parviflora</i>	1	10	25	15	4	3		X
106	Chinese elm	<i>Ulmus parviflora</i>	1	6	25	15	4	3		X
107	Chinese elm	<i>Ulmus parviflora</i>	3	6, 6, 6	25	15	4	3		X
108	Canary Island pine	<i>Pinus canariensis</i>	1	6	20	10	4	3		X
109	Chinese elm	<i>Ulmus parviflora</i>	1	12	25	15	4	4		X
112	common fig	<i>Ficus carica</i>	1	5	20	10	4	3		X
113-1	Chinese elm	<i>Ulmus parviflora</i>	1	6	20	10	4	4		X
113-2	Chinese elm	<i>Ulmus parviflora</i>	1	8	20	10	4	4		X
113-3	Chinese elm	<i>Ulmus parviflora</i>	1	6	20	10	4	3		X
113-4	Chinese elm	<i>Ulmus parviflora</i>	1	10	25	15	4	4		X
113-5	Chinese elm	<i>Ulmus parviflora</i>	1	9	25	10	4	4		X
113-6	shamel ash	<i>Fraxinus uhdei</i>	1	4	18	10	4	3		X
114-1	Aleppo pine	<i>Pinus halepensis</i>	1	20	30	20	4	4		X
114-2	Canary Island pine	<i>Pinus canariensis</i>	1	4	20	10	4	3		X
115	Siberian elm	<i>Ulmus pumila</i>	1	10	20	15	4	3		X
116-1	Chinese elm	<i>Ulmus parviflora</i>	1	10	20	12	4	4		X
116-2	Chinese elm	<i>Ulmus parviflora</i>	1	8	20	10	4	3		X
116-3	Chinese elm	<i>Ulmus parviflora</i>	1	12	25	15	4	4		X
116-4	Chinese elm	<i>Ulmus parviflora</i>	1	6	20	12	4	3		X
116-5	Chinese elm	<i>Ulmus parviflora</i>	1	6	20	10	4	3		X
116-6	Chinese elm	<i>Ulmus parviflora</i>	1	8	20	12	4	3		X
116-7	Chinese elm	<i>Ulmus parviflora</i>	1	10	20	15	4	3		X
120	Aleppo pine	<i>Pinus halepensis</i>	1	18	35	25	4	4		X
121	Aleppo pine	<i>Pinus halepensis</i>	1	24	40	25	4	4		X
122	Aleppo pine	<i>Pinus halepensis</i>	1	18	35	20	4	4		X
123	Aleppo pine	<i>Pinus halepensis</i>	1	20	35	25	4	4		X
124	Aleppo pine	<i>Pinus halepensis</i>	1	20	30	20	4	4		X
125-1	Chinese elm	<i>Ulmus parviflora</i>	1	8	20	20	4	4		X

**TABLE A-2  
NON-NATIVE TREES TO BE REMOVED**

Tree Number	Tree Species		Number of Trunks	DBH (inches)	Height (ft)	Canopy (ft)	ISA Condition	Health Rating	Reason for Removal	
	Common Name	Scientific Name							Condition-based	Non-Condition-Based
125-2	Chinese elm	<i>Ulmus parviflora</i>	1	4	15	12	4	3		X
126	shamel ash	<i>Fraxinus uhdei</i>	4	6, 6, 8, 8	20	20	4	3		X
127	Mexican fan palm	<i>Washingtonia robusta</i>	1	12	3	8	4	3		X
128	Mexican fan palm	<i>Washingtonia robusta</i>	1	12	3	8	4	3		X
129	Chinese elm	<i>Ulmus parviflora</i>	1	10	25	20	4	4		X
134	blue gum	<i>Eucalyptus globulus</i>	4	14, 18, 20, 26	40	35	4	4		X
140	blue gum	<i>Eucalyptus globulus</i>	1	40	40	30	4	4		X
141	blue gum	<i>Eucalyptus globulus</i>	3	10, 20, 36	40	25	4	4		X
142	blue gum	<i>Eucalyptus globulus</i>	1	12	25	18	4	4		X
143	blue gum	<i>Eucalyptus globulus</i>	5	18, 20, 20, 22, 28, 30	40	35	4	4		X
145	blue gum	<i>Eucalyptus globulus</i>	1	4	15	10	4	4		X
146	blue gum	<i>Eucalyptus globulus</i>	1	40	40	30	4	4		X
147	blue gum	<i>Eucalyptus globulus</i>	2	25, 30	35	30	4	4		X
148	Peruvian pepper tree	<i>Schinus molle</i>	1	18	25	20	4	4		X
149	blue gum	<i>Eucalyptus globulus</i>	1	20	30	25	4	4		X
150	blue gum	<i>Eucalyptus globulus</i>	2	18, 24	40	35	4	4		X
151	blue gum	<i>Eucalyptus globulus</i>	1	40	40	30	4	4		X
152	blue gum	<i>Eucalyptus globulus</i>	1	18	30	25	4	4		X
153	blue gum	<i>Eucalyptus globulus</i>	5	18, 20, 22, 28, 30	45	30	4	4		X
154	blue gum	<i>Eucalyptus globulus</i>	1	10, 12	30	15	4	4		X
155	blue gum	<i>Eucalyptus globulus</i>	1	20	30	15	4	4		X
156	blue gum	<i>Eucalyptus globulus</i>	1	12	20	15	4	4		X
157	Canary Island pine	<i>Pinus canariensis</i>	1	14 <sup>a</sup>	60	30	4	4		X
158	Cajeput tree	<i>Melaleuca quinquenervia</i>	1	27 <sup>a</sup>	30	30	3	3		X
159	Chinese elm	<i>Ulmus parviflora</i>	1	6 <sup>a</sup>	12	15	4	3		X
160	Canary Island pine	<i>Pinus canariensis</i>	1	16 <sup>a</sup>	60	25	4	4		X
161	Canary Island pine	<i>Pinus canariensis</i>	2	10, 10 <sup>a</sup>	50	25	4	4		X
162	Chinese elm	<i>Ulmus parviflora</i>	1	15 <sup>a</sup>	25	30	4	3		X
163	Canary Island pine	<i>Pinus canariensis</i>	2	10, 12 <sup>a</sup>	60	40	4	4		X

**TABLE A-2  
NON-NATIVE TREES TO BE REMOVED**

Tree Number	Tree Species		Number of Trunks	DBH (inches)	Height (ft)	Canopy (ft)	ISA Condition	Health Rating	Reason for Removal	
	Common Name	Scientific Name							Condition-based	Non-Condition-Based
164	Aleppo pine	<i>Pinus halepensis</i>	1	29 <sup>a</sup>	50	45	4	4		X
165	loquat	<i>Eriobotrya japonica</i>	1	7 <sup>a</sup>	15	12	4	3		X
166	Canary Island pine	<i>Pinus canariensis</i>	1	15 <sup>a</sup>	25	25	3	2		X
167	Canary Island pine	<i>Pinus canariensis</i>	1	14 <sup>a</sup>	40	15	3	2		X
168	Aleppo pine	<i>Pinus halepensis</i>	1	29 <sup>a</sup>	50	60	4	4		X
169	sugar gum	<i>Eucalyptus cladocalyx</i>	3	1.5, 1, 1 <sup>a</sup>	15	5	4	3		X
170	Canary Island pine	<i>Pinus canariensis</i>	1	11 <sup>a</sup>	55	20	3	3		X
171	sugar gum	<i>Eucalyptus cladocalyx</i>	1	23 <sup>a</sup>	55	40	3	3		X
172	sugar gum	<i>Eucalyptus cladocalyx</i>	1	12	25	20	4	3		X
173	Chinese elm	<i>Ulmus parviflora</i>	1	12 <sup>a</sup>	30	35	4	4		X
174	Chinese elm	<i>Ulmus parviflora</i>	1	11 <sup>a</sup>	25	25	4	3		X
175	Canary Island pine	<i>Pinus canariensis</i>	1	9 <sup>a</sup>	30	15	3	2		X
176	Canary Island pine	<i>Pinus canariensis</i>	1	19 <sup>a</sup>	60	35	4	4		X
177	tree of heaven	<i>Ailanthus altissima</i>	10	1 <sup>a</sup>	10	2	4	4		X
178	Canary Island pine	<i>Pinus canariensis</i>	1	5 <sup>a</sup>	12	15	4	3		X
179 <sup>b</sup>	black locust	<i>Robinia pseudoacacia</i>	1-4	3-5, 2-4 <sup>a</sup>	10	10	4	4		X
180	sugar gum	<i>Eucalyptus cladocalyx</i>	1	6 <sup>a</sup>	15	10	4	4		X
181	Aleppo pine	<i>Pinus halepensis</i>	1	15	40	35	4	4		X
182	sugar gum	<i>Eucalyptus cladocalyx</i>	2	18, 19	40	25	4	4		X
183	sugar gum	<i>Eucalyptus cladocalyx</i>	4	1, 1, 1, 1	20	10	4	4		X
184	sugar gum	<i>Eucalyptus cladocalyx</i>	3	1, 1, 0	10	8	4	4		X
185	sugar gum	<i>Eucalyptus cladocalyx</i>	1	28	40	25	4	3		X
186	sugar gum	<i>Eucalyptus cladocalyx</i>	1	15	25	15	n/a	n/a		X
187	sugar gum	<i>Eucalyptus cladocalyx</i>	1	31	55	20	3	2		X
188	sugar gum	<i>Eucalyptus cladocalyx</i>	4	12, 4, 4, 10	35	20	4	4		X
189	sugar gum	<i>Eucalyptus cladocalyx</i>	1	13	25	25	4	3		X
190	sugar gum	<i>Eucalyptus cladocalyx</i>	1	44	50	20	n/a	n/a		X
191	sugar gum	<i>Eucalyptus cladocalyx</i>	1	27	30	30	4	3		X
192	sugar gum	<i>Eucalyptus cladocalyx</i>	2	13, 14	30	20	4	3		X
193	sugar gum	<i>Eucalyptus cladocalyx</i>	2	19, 5	25	15	4	3		X
194	sugar gum	<i>Eucalyptus cladocalyx</i>	2	25, 22	50	20	4	4		X

**TABLE A-2  
NON-NATIVE TREES TO BE REMOVED**

Tree Number	Tree Species		Number of Trunks	DBH (inches)	Height (ft)	Canopy (ft)	ISA Condition	Health Rating	Reason for Removal	
	Common Name	Scientific Name							Condition-based	Non-Condition-Based
196	sugar gum	<i>Eucalyptus cladocalyx</i>	1	25	50	30	4	3		X
199	sugar gum	<i>Eucalyptus cladocalyx</i>	1	34	50	25	4	3		X
200	sugar gum	<i>Eucalyptus cladocalyx</i>	2	10, 37	40	25	4	3		X
201	sugar gum	<i>Eucalyptus cladocalyx</i>	4	18, 12, 10, 8	20	10	2	1		X
202	sugar gum	<i>Eucalyptus cladocalyx</i>	1	28	50	30	4	3		X
203	sugar gum	<i>Eucalyptus cladocalyx</i>	1	25	50	25	4	4		X
204	sugar gum	<i>Eucalyptus cladocalyx</i>	4	10, 11, 8, 15	30	25	4	4		X
<sup>a</sup>	DBH has been estimated due to access limitations.									
<sup>b</sup>	Polygon consisting of 20 individuals. Numbers associated are a general range describing those present.									

**x-xx.xx Non-Native Shrub and Non-Native Herbaceous Species Removal**

The Contractor shall perform thorough treatment and removal of the non-native shrubs and non-native herbaceous species that occur in the Project site, as summarized in Table A-2. The initial non-native shrub and non-native herbaceous species removal shall occur between September 16 and October 15—i.e., outside the nesting bird and raptor season. Follow-up inspections/removal/re-treatment of all the initial weed removal locations shall subsequently be performed for 14 weeks between October 16 and January 31 (also outside the nesting bird and raptor season).

The Contractor shall perform inspections, and as-needed maintenance, of all treatment locations not less than once every four weeks, between October 16 and January 31.

Methods of treatment may include mechanical removal, the cut and paint method of herbicide application, and/or foliar application of herbicide as described below. Appropriate methods of weed control will be determined through consultation among the City, the Contractor, and the City's Biological Monitor, based on site conditions. The City's Biological Monitor shall conduct periodic tailboard meetings on environmental resource protection for the Contractor's crew during the initial removal period and the 14-week maintenance period (for non-native shrub and herbaceous plant removal areas). Existing native plants/seedlings shall be protected during all weed removal/treatment activities.

All applied herbicides will include an agriculturally suitable marker dye to facilitate thorough coverage and to alert City staff and park users to the location of recently treated vegetation. Any use of herbicides shall be coordinated with the City's Biological Monitor. Herbicide use and other maintenance tasks may be suspended by the City's Biological Monitor based on sensitive biological resource issues in the project vicinity (e.g., nesting birds). In general, non-chemical methods of weed control are preferred by the City of Pasadena. **No herbicide shall be applied except with the specific permission (per application event) of the City of Pasadena.**

- A. Mechanical Removal: String trimmers and other mechanical or hand-removal methods will be used, as appropriate, to remove broadleaf weed species. All green waste resulting from weeding activities will be immediately removed and disposed of at an off-site landfill location (i.e., weeds shall not be stockpiled on site), except with the specific permission of the City of Pasadena. The seed heads of invasive weeds (e.g., tree tobacco) shall be carefully cut and bagged to minimize seed dispersal onto the natural area.
- B. Cut and Paint Method of Herbicide Application: With advanced City approval, an herbicide that is approved by the USEPA for application in wetland habitat areas (e.g., Roundup Custom®) may be applied to some larger invasive weed species (e.g., tree of heaven; castor bean; tree tobacco; Spanish broom) using the cut-and-paint application method. The cut-and-paint method consists of (1) cutting the stem(s) of the shrub to a height of 12 inches or less and removing all aboveground debris from the site; (2) applying glyphosate at a 10 percent rate to the cut stem/stump within 2 minutes of cutting the stem.
- C. Foliar Application of Herbicide: With advanced City approval, an herbicide that is approved by the U.S. Environmental Protection Agency (USEPA) for application in wetland habitat areas (e.g., Roundup Custom®) may be applied to small (i.e., less than three feet tall) invasive plant species that are established on the Project Site. The following removal techniques will be used:
  1. Herbicide should be applied to each plant at a minimum rate of 1.5 percent to ensure that each plant receives a comprehensive and fully effective treatment and that re-sprouting from root materials is minimal. Application will consist of (1) spot

applications to individual plants where weed coverage is sparse and (2) broadcast applications to dense patches of weed species. Applications should be on a spray-to-wet basis, and coverage should be uniform and complete. Contact with native shrub and grass species should be avoided as much as possible; in the event of gusty winds or winds in excess of five miles per hour, all work shall be temporarily discontinued to protect applicators and adjacent natural resources. Treatments should also be temporarily discontinued in the event of rainfall since rainfall reduces the effectiveness of the herbicide.

2. Sprayed vegetation should be left undisturbed for seven days to allow the herbicide to be distributed throughout the entire plant. Visible effects of herbicide application consist of wilted foliage, brown foliage, and disintegrated root material.
3. All treated plant materials should be removed by hand tools, a string trimmer, or other appropriate equipment, and disposed of off-site in a landfill.
4. The steps listed above should be repeated two to three times every two to three weeks following the initial treatment to remove seedling exotic species.
5. All herbicide use shall comply with local codes and regulations. A minimum of two day's advance notice of any herbicide application shall be provided to the City's Biological Monitor. Allowance for use of herbicide is cannot be guaranteed at this time.

#### **x-xx.xx Erosion Control Measures**

Following the initial removal of non-native vegetation (as described in **Section x-xx.xx** of the specifications), the Contractor shall provide, install, maintain, and replace (as needed) ecologically suitable erosion control measures (as needed) to maintain soils stability in the invasive/non-native plant removal areas (e.g., slopes following the removal of weedy brush). Only ecologically suitable erosion control measures shall be used, to include (a) fully bio-degradable, weed-free, natural burlap-encased (not 'photo-degradable' plastic mesh) fiber rolls (secured with wooden stakes, not metal wire), and/or (b) temporary toe-of-slope silt fencing. Mid-slope straw wattles shall be placed at a suitable vertical spacing to minimize erosion. Silt fencing shall be partially buried as needed to enhance stability. Silt fencing shall be repositioned, or removed and replaced as needed, to maintain proper function and to avoid disintegration and dispersal of the fencing materials on the Project Site. All erosion control materials shall remain in place at the end of the 14-week maintenance period.

#### **x-xx.xx Inspection**

The Contractor shall request inspection by Project Manager at the following steps, prior to proceeding with the next task:

- Upon the completion of installation of all western sycamore trees, and quarterly thereafter, during the 12-month maintenance period.
- Upon completion of all non-native tree removal tasks.
- Upon completion of all initial non-native shrub and non-native herbaceous removal tasks in each of the four Enhancement Areas (i.e., up to four separate inspections).
- Final inspection, at the end of the 14-week maintenance period (October 16 to January 31).



At least 48-hour notice must be given to the Project Manager to schedule an inspection. The Contractor shall be on site at the time of each inspection. The City's representative will prepare a "punch list" of those items which must be corrected before re-inspection for final acceptance. The representative will determine an appropriate time period for corrections...

**x-xx.xx Landscape Planting**

Provide labor, materials (western sycamore trees), equipment, transportation and services necessary to complete the Landscape Planting and Plant Establishment Period as described below. Scope:

1. Contractor shall provide labor, materials, and equipment for planting operations as described in specifications.
2. Contractor shall efficiently coordinate landscape planting operations with other operations involved or affected, including protection of existing trees, and County of Los Angeles' maintenance activities on the spreading grounds.
3. Contractor shall have on the site at all times a copy of the specifications and a representative capable of reading and interpreting them.

A. Work Included:

1. Excavation of planting holes, creation of watering basins, and planting of western sycamore trees. The work shall be included in the unit bid price per plants in the Bidder's Proposal.

**x-xx.xx Landscape Planting - Materials**

Landscape planting and plant establishment materials shall conform to the following:

A. Plant Material:

Contractor shall furnish 15-gallon western sycamore trees. The planting material will be delivered to the Project site in a timely manner, in coordination with the contractor's day-to-day preparation of planting sites, to avoid the storage of plant materials on the site on an overnight basis. Once the plant material has been delivered to the Project site, it is the responsibility of the contractor to ensure that the plants are safely and securely stored and watered regularly. Any plant material that dies or deteriorates into an unacceptable condition during the time of contract shall be replaced at the contractor's expense. The root ball of all plant material shall be moistened as needed during pre-installation storage on the Project site, and immediately prior to installation, to maintain optimal plant condition.

**x-xx.xx Landscape Planting - Execution**

Schedule the delivery of plants with City's Biological Monitor and arrange for inspection of western sycamore trees upon delivery (by City's Certified Arborist) for injury, root condition, insect infestation, forms and health upon delivery. The delivery and installation shall be scheduled to that all plants can be installed on the same date as delivery, to avoid extended storage on the site.

- A. Plant Layout, Approval: The City's Biological Monitor shall mark the locations of all western sycamore planting locations with flagged 4-foot lath, with lath and flagging tape to be

provided by the Contractor. Do not begin excavation of planting holes until stake out of plant locations has been completed by the City's Biological Monitor.

B. Western Sycamore Planting Details:

1. No fertilizers or pesticides shall be used for the western sycamore plantings.
2. Mid-slope planting basins shall be excavated by hand, or via machinery, to a minimum width of 6.0 feet, and a minimum depth of 1.0 foot (basin bottom to top of berm), prior to container plant installation. The typical planting hole shall be excavated to approximately twice the width and depth of the root ball.
3. Planting holes shall be filled with water immediately prior to plant installation, and the water shall be allowed to percolate fully into the soil. The planting holes shall then be filled with water a second time, and the water shall fully percolate into the soil, prior to planting. The minimum volume of water to be applied to each western sycamore tree on each watering event shall be 50 gallons.
4. Plants shall be removed from the containers in a manner that avoids damage to the rootball. Extended tap root development and minor rootbound conditions shall be appropriately treated via pinching and loosening of appropriate portions of the rootball prior to planting.
5. Each plant shall be installed so that the "collar" or soil level is slightly higher than the surrounding finished grade to allow for partial plant settling over time.
6. The excavated soil backfill material shall be placed into the planting hole to the existing grade, and gently compacted around the rootball.
7. A watering basin six-feet in diameter shall be created around each plant to facilitate the initial watering-in of the plants. The exposed upper sides of the rootball shall be covered with backfill material sloping down into the basin.
8. Each plant shall be initially watered-in by hand; the watering basins shall be filled using a low-force hose to avoid erosion of the rootball. The water spray shall be directed to the outer part of the watering basin to avoid damage to the plant roots or crown.
9. The Contractor is to remove from the work site all excess materials (e.g., debris, equipment, empty plant containers) daily through duration of Project.

C. Mulch

Immediately following (i.e., the same day) the completion of western sycamore trees installation in Area 1, the Contractor shall furnish and install a weed-free and pest-free, natural mulch within the planting basins to a depth of 3" to 4". An approved mulch supplier (i.e., Certified by the US Composting Council) shall be able to demonstrate (a) that the provided materials have been composted at a suitable minimum temperature and duration to avoid the dispersal of polyphagous shot hole borer or other insect pathogens, or living weeds or viable weed seeds; and (b) that the material does not contain 'curbside material', biosolids (sludge), grass, or herbicides.

F. Maintenance, Inspection, Guarantees

1. Maintenance: The Contractor shall continuously maintain all western sycamore planting locations (watering, weeding, mulch etc.) during the one-year maintenance period, to ensure good normal growth.

2. Contractor shall be responsible for not over- or under-watering plant material.
3. Restore water basin berm and mulch layer as needed.
4. Remove and replace damaged, diseased, or dead/dying western sycamore trees within ten (10) working days from notification. All replacement western sycamore trees shall be from the same supplier/vendor (i.e., Tree of Life Nursery in San Juan Capistrano, CA) with pre-approval of nursery stock by City's Biologist.
5. All western sycamore planting areas shall be kept free of man-made debris and weeds to the extent practicable (within the planting basins).
6. All maintenance activities during the one-year maintenance period shall be conducted by the Contractor at not more than 14-day intervals.
7. Correct defective work.
8. All paved areas shall be kept continuously clear of mud, debris, and puddles that may occur as the result of Project activities, and no Project-related materials shall be left in any roadway or trails area to cause an obstruction.
9. All jurisdictional drainages shall be maintained clear of Project-specific vegetative debris and displaced soil that obstructs proper storm flows.

**APPENDIX B**

**PROPOSED ELEMENT ACTIVITY PHASING SCHEDULE**

**PROPOSED ELEMENT ACTIVITY PHASING SCHEDULE**

Fiscal Year	Element Activities	Responsible Party/Role
FY2020	Adjacent Lands - Kick-off a public outreach program designed to inform project area neighbors, stake holders, and other interested parties of the HEP goals, their importance, and how everyone can help. Methods of vegetation maintenance and appropriate landscaping methods (for the urban/wildland interface) on adjacent properties and encouragement/opportunities for involvement shall be presented.	Consultant to develop outreach/education plan; City to organize logistics of outreach, volunteer groups to support efforts.
	Fuel Modification Zone – Vegetation removal using an alternative to current approach, to reduce spreading of non-native species where feasible throughout City’s fuel modification zone	Contractor to provide labor and materials; City to manage contract; Consultant to provide contractor oversight.
	Behner Habitat Restoration Site 1 – Volunteers with oversight shall (1) remove all non-native herbaceous plants within the polygon and immediately adjacent buffer as feasible; (2) install native container plants and/or broadcast seed; and (3) perform regular maintenance.	Consultant to develop detailed plan and oversight; volunteer groups to provide resources; City to supplement resources.
	Areas 3 and 4 - Removal of all identified non-native herbaceous plants and others as detected in Areas 3 and 4	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Upper Area 1 (JPL Bridge to Equestrian Trail Crossing) - Removal of all identified non-native <u>trees</u> (including the Behner Restoration Area) and <u>herbaceous plants</u> and potentially others as detected in Upper Area 1	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
FY2021	Area 2 - Removal of all identified non-native <u>trees</u> and potentially others as detected in Areas 2	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Adjacent Lands - Continue to implement a public outreach program designed to inform project area neighbors, stake holders, and other interested parties of the HEP goals, their importance, and how everyone can help. Methods of vegetation maintenance and appropriate landscape landscaping methods (for the urban/wildland interface) on adjacent properties and encouragement/opportunities for involvement shall be presented. At least annually restate goals, importance, status of plan implementation, and how everyone can help.	Consultant to develop outreach/education plan; City to organize logistics of outreach, volunteer groups to support efforts.
	Fuel Modification Zone – Vegetation removal using an alternative to current approach, to reduce spreading of non-native species where feasible throughout City’s fuel modification zone	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Behner Habitat Restoration Sites 1 and 2 – Volunteers with oversight shall continue to maintain the BHR Site 1 and initiate BHR Site 2—i.e., remove all non-native herbaceous plants within the polygon and immediately adjacent buffer as feasible and plant additional container plants and/or broadcast seed as needed.	Consultant to develop detailed plan and oversight; volunteer groups to provide resources; City to supplement resources.
	Areas 3 and 4 – Revisit and remove re-occurring populations of originally identified non-native herbaceous plants and others throughout as they are detected in Areas 3 and 4	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Upper Area 1 - Revisit and remove re-occurring populations of originally identified non-native herbaceous plants and trees and others throughout as they are detected in Upper Area 1	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.

**PROPOSED ELEMENT ACTIVITY PHASING SCHEDULE**

Fiscal Year	Element Activities	Responsible Party/Role
FY2022	Area 2 - Revisit and remove re-occurring populations of originally identified non-native herbaceous <u>trees</u> and others throughout as they are detected in Area 2	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Area 2 - Removal of all identified non-native <u>herbaceous plants</u> and potentially others as detected in Area 2	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Lower Area 1 (Equestrian Trail Crossing to southernmost basin) - Removal of all identified non-native <u>trees</u> and potentially others as detected in Lower Area 1	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Sycamore Planting Area (within Area 1) – Plant sycamores, water, and maintain.	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Adjacent Lands - Continue to implement a public outreach program designed to inform project area neighbors, stake holders, and other interested parties of the HEP goals, their importance, and how everyone can help. Methods of vegetation maintenance and appropriate landscaping methods (for the urban/wildland interface) on adjacent properties and encouragement/opportunities for involvement shall be presented. At least annually to restate goals, importance, status of plan implementation, and how everyone can help.	Consultant to develop outreach/education plan; City to organize logistics of outreach, volunteer groups to support efforts.
	Fuel Modification Zone – Vegetation removal using an alternative to current approach, to reduce spreading of non-native species where feasible throughout City’s fuel modification zone	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Behner Habitat Restoration Sites 1 and 2 – Volunteers with oversight shall continue to maintain BHR Site 1 and initiate restoration tasks on BHR Site 2, including (1) remove all non-native herbaceous plants within the polygon and immediately adjacent buffer as feasible; (2) install native container plants and/or broadcast seed; and (3) perform long-term maintenance.	Consultant to develop detailed plan and oversight; volunteer groups to provide resources; City to supplement resources.
Areas 3 and 4 – Revisit and remove re-occurring populations of originally identified non-native herbaceous plants and others throughout as they are detected in Areas 3 and 4	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.	

**PROPOSED ELEMENT ACTIVITY PHASING SCHEDULE**

Fiscal Year	Element Activities	Responsible Party/Role
<b>FY2023</b>	Adjacent Lands - Continue to implement a public outreach program designed to inform project area neighbors, stake holders, and other interested parties of the HEP goals, their importance, and how everyone can help. Methods of vegetation maintenance and appropriate landscaping methods (for the urban/wildland interface) on adjacent properties and encouragement/opportunities for involvement shall be presented. At least annually to restate goals, importance, status of plan implementation, and how everyone can help.	Consultant to develop outreach/education plan; City to organize logistics of outreach, volunteer groups to support efforts.
	Fuel Modification Zone – Vegetation removal using an alternative to current approach, to reduce spreading of non-native species where feasible throughout City’s fuel modification zone	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Behner Habitat Restoration Sites 1, 2 and 3 – Volunteers with oversight shall continue to maintain BHR Site 1 and Site 2, , including (1) remove all non-native herbaceous plants within the polygon and immediately adjacent buffer as feasible; (2) install native container plants and/or broadcast seed; and (3) perform long-term maintenance.  Restoration will be initiated within BHR Site 3, including (1) preliminary relocation of the perimeter chain-link [with barbed wire] fencing) (if City determines to be feasible); (2) select non-native tree and shrub removals as approved; (3) removal of all non-native herbaceous plants within the polygon; (4) potential installation of a line irrigation system (if feasible; by branching off the existing Behner system); and (5) installation of container plants and/or broadcast seed throughout the polygon; and (6) perform long-term maintenance.	Consultant to develop detailed plan and oversight; volunteer groups to provide resources; City to supplement resources.
	Areas 1 through 4 – Revisit and remove re-occurring populations of originally identified non-native herbaceous plants and others throughout as they are detected in Areas 1 through 4	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.
	Sycamore Planting Area (within Area 1) – Maintain sycamores.	Contractor to provide labor and materials; City to manage contract; Consultant to provide oversight.