Seventh Annual Monitoring Report

Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

Environmental Impact Report Mitigation Measure Nos. Bio-D and Bio-E

California Department of Fish and Wildlife Streambed Alteration Agreement No. 1600-2008-0173-R5

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TABLE OF CONTENTS

TABLES

EXHIBITS

ATTACHMENTS

Attachment

ATTACHMENT A
MITIGATION PROGRAM BACKGROUND

Section **Page**

TABLES

Table **Page**

1.0 INTRODUCTION

This is the seventh Annual Monitoring Report for the Los Angeles County Public Works' (Public Works') Oak Woodland Habitat Revegetation/Mitigation Program (OWHRMP) for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project (BonTerra Psomas 2014). This report provides a summary of Year Seven performance as part of the required mitigation program in compliance with the Project's permits and the approved OWHRMP. A detailed discussion of the mitigation program background (e.g., Project impacts and required mitigation, responsible parties, performance standards, site preparation, and installation) is provided in Attachment A. The mitigation site location is shown in Exhibits 1, 2, and 3. Site photographs are provided in Attachment B.

It is important to note that the 2022 vegetation surveys were performed in a year of moderate drought. Based on data from Public Works' website, the area received a total of 15.64 inches of precipitation between October 1, 2021, and September 30, 2022 (i.e., the relevant 'water year', which ends on September 30 each year). This rainfall total was recorded at the Arcadia Fire Station, which is located 0.5 mile from the Lower Sediment Placement Site (SPS) at a similar elevation. The average seasonal precipitation at the Arcadia gauge station measured since 1968 is 19.88 inches. Therefore, the recorded precipitation through September 30, 2022, was approximately 78 percent of the average annual precipitation amount.

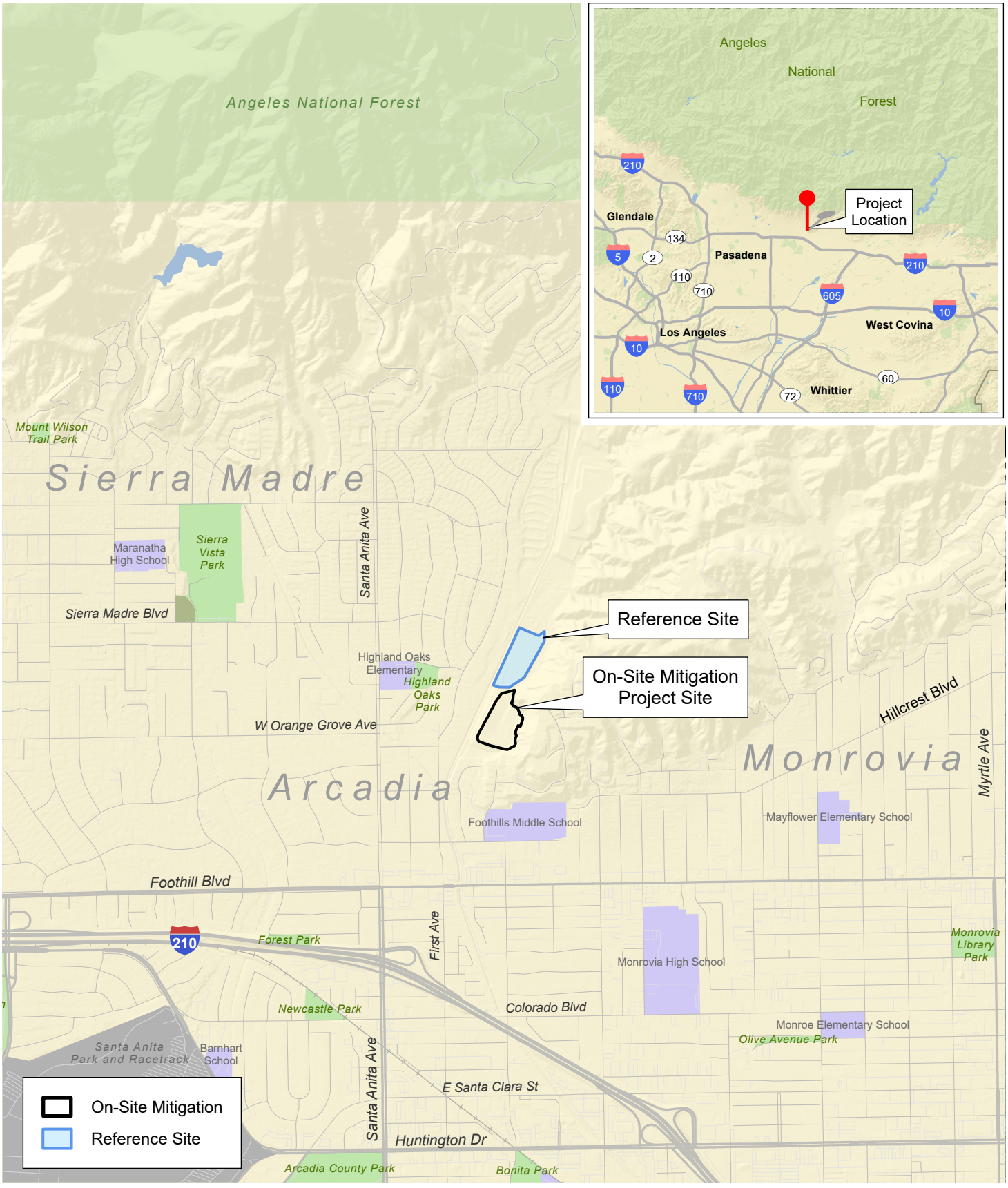
2.0 HABITAT MAINTENANCE – YEAR SEVEN

Mitigation installation was completed in December 2014, and the seven-year to ten-year mitigation maintenance clock began on January 1, 2015. Nakae & Associates, Inc. (Nakae) performs maintenance tasks on the mitigation site in compliance with the terms of the OWHRMP. Maintenance of the 8.0-acre site is very complex due to the innovative restoration methods being employed on the site (e.g., coarse woody debris [CWD] placement); the temporary exclusion of large mammals (e.g., keeping gates closed and locked at all times), the high diversity of native and non-native plant species, the rapid colonization by wildlife species, the operational issues associated with the structural integrity of the Lower SPS (e.g., drainage facilities), tasks related to adjacent land uses (e.g., vector control, quiet entry protocols), and other issues.

The highest priority for mitigation site performance is the growth and survival of planted oaks. Nakae performs careful maintenance; as the growing branch tips of the oaks rose above deer browsing height, Nakae removed the upper 4 feet of caging to enable the trees to assume a natural, spreading form. The lower 2 feet of temporary caging has been left in place as a longer-term rodent deterrent.

Non-native plant species are promptly removed when observed during regular maintenance activities. To the extent practicable, Nakae removes weeds prior to seed production/dispersal to avoid re-infestation of the site. The Los Angeles County Board of Supervisors banned the use of glyphosate-based herbicides on Los Angeles County properties on March 19, 2019, and Public Works suspended the use of all herbicides on the mitigation site on April 18, 2019.

> *Note: On February 16, 2023, Public Works reaffirmed their ban on the use of glyphosate, while recognizing the value of using diverse methods of weed control described in the Countywide Integrated Pest Management (IPM) Program. Although the County's IPM program allows for the use of some herbicides, herbicide application has not resumed on the Lower SPS since 2019 because native and non-native plants/seedlings are intergrown to a degree that removal by hand (rather than using herbicide) is necessary to protect developing native plant*



D:\Projects\COLADPW\J151407\PRO\SantaAnitaDam_Mitigation\SantaAnitaDam_Mitigation.aprx\Regional Vicinity Map

Project Vicinity

Exhibit 1

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

N W E S

2,000 1,000 0 2,000 Feet

PSOMAS

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D:\Projects\COLADPW\SAReservoir\PRO\SAReservoir_Project\SAReservoir_Project.aprx\Sediment Placement Site Locations

Sediment Placement Site Locations

Exhibit 2

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

N
W E
S

600 300 0 600
Feet

PSOMAS

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Drainages — 1.63 acres
Defensible Space Vegetation Requirement (Approximate)*
Government-Owned Land
Parcel Boundary
Oak Woodland Mitigation — 5.50 acres
Coastal Sage Scrub Revegetation — 2.50 acres
Photo Station

Vegetation Sampling Blocks

CSS1, CSS2...

OW1, OW2...

Weed Abatement Buffer Areas

Area 1 (0.78 Acre; to East Property Line)
Area 2 (2.32 Acres)
Area 3a (1.72 Acres)
Area 3b (0.45 Acre)
Area 4 (1.74 Acres)
Area 5 (0.37 Acre)

Waypoints

Start Waypoint
End Waypoint

Transects and Quadrats

Transect
Quadrat Diagonal
Quadrat Boundary

Santa Anita Channel

Photo Station 1
Photo Station 2
Photo Station 3
Photo Station 4
Photo Station 5
Photo Station 6
Photo Station 7
Photo Station 8
Photo Station 9

cssT1_B
cssT1_A_281
cssQ1_B
cssQ1_A_6
cssT2_A_82
cssT2_B
oakQ1_B
oakQ1_A_69
oakT1_B
oakT2_B
oakT2_A_320
oakT1_A_8
oakQ2_A_169
oakQ2_B
cssT6_B
cssT6_A_343
oakT3_B
oakT3_A_283
oakQ4_A_166
oakQ3_B
oakQ4_B
oakQ3_A_9
oakT4_A_143
cssQ2_A_149
cssQ2_B
oakQ5_A_208
oakQ5_B
oakT4_B
oakT5_B
oakT5_A_271
oakQ6_B
oakQ6_A_301
cssT4_A_247
cssT4_B
cssQ3_B
cssQ3_A_33
cssT5_A_179
cssT5_B
oakT6_B
oakT6_A_52
cssT3_B
cssT3_A_344

Area 1
Area 2
Area 3
Area 4
Area 5
Area 6

Oakglen Ave

*Defensible Space Vegetation Requirement is 100-ft. per City of Arcadia

Aerial Source: Nearmap 2023

D:\Projects\COLADPW\SAReservoir\PRO\SAReservoir_Project\SAReservoir_Project.aprx\Mitigation\Revegetation Sites

Mitigation/Revegetation Sites and Weed Abatement Buffer Areas

Exhibit 3

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

N W E S 100 50 0 100 Feet

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species. Intensive manual removal of weeds is performed year-round in areas that are not designated as environmentally sensitive (e.g., nesting bird areas) by the Biological Monitor.

Supplemental irrigation was suspended on the oak woodland (SPS deck) mitigation site from October 2016 to February 2018; however, due to acute/prolonged drought conditions, operation of the bubbler system (only) was resumed with Public Works' approval on February 28, 2018. With the onset of seasonal rains, bubbler irrigation was discontinued (again) in October 2018. Irrigation has not been applied to the coastal sage scrub planting areas (SPS slopes) since June 9, 2015. The use of irrigation was phased out as soon as possible (based on year-to-year weather conditions) to foster adaptation of native plant species to the typical semi-arid growing conditions in this region. It is anticipated that, unless an extended period of acute drought occurs on the mitigation site during the remainder of the 7- to 10-year maintenance period (Year Seven ended on December 31, 2022), no additional irrigation of the oak trees will be required for proper long-term establishment.

Psomas collected a total of four pounds of acorns of coast live oak (*Quercus agrifolia* var. *agrifolia*) and Engelmann oak (*Quercus engelmannii*) from multiple heritage trees in the local Santa Anita Wash – Rio Hondo subwatershed and planted the acorns on the oak woodland mitigation site in fall 2021. Supplemental seed mixes were applied to approximately 200 small patches on the site (that exhibited lower native vegetation cover) in fall 2021 to improve vegetative cover and diversity. Psomas Biologists placed color-coded wire flags at these locations and sowed a portion of seed at each patch. Immediately after the seed was applied, Nakae scratched the seed into the soil using heavy-duty bow rakes. The seed of shrub species was excluded from seeding patches located in designated herbaceous meadow or spiniferous scrub areas to retain a beneficial habitat mosaic. The 2021 seed materials were of local genetic origin—collected by Psomas' subcontractor S&S Seeds, Inc. in the local subwatershed. The supplemental seed species (25 species) and quantities (46.68 pounds total) are listed in Table 1.

Psomas' collected a total of 76 cuttings of Vasey's prickly-pear (*Opuntia vaseyi*) (cactus) from the Santa Anita Middle SPS in November 2021. Following a period of scabbing-off in shaded storage, the pads were planted by Nakae on the eastern slope (Buffer Area 1) prior to the onset of substantial seasonal rains in December 2021. The Biological Monitor placed colored wire flags to mark the planting locations of the cactus cuttings, which are non-irrigated and expected to establish on rainfall amounts only. As they develop roots, the planted cactus pads will enhance soil stability on these steeper slopes that were previously poorly vegetated.

Psomas' also installed a total of 51 native container plants on the mitigation site in December 2021, including wrinkled rush (*Juncus rugulosus*), basket rush (*Juncus textilis*), coffee fern (*Pellaea andromedifolia*), bird's-foot fern (*Pellaea mucronata*), and California rose (*Rosa californica*). The rushes and roses were planted in moist areas along the spiraling drainages on the site, and the ferns were installed in protected/shaded niches along the north edge of placed boulders on the site. The rose planting locations were selected to provide significant shading, and a native mulch was deeply applied around each planting. It is anticipated that most of these new container plants will survive on rainfall and storm flow alone and that no irrigation will be provided. The container plants were provided by California Botanic Garden (formerly Rancho Santa Ana Botanic Garden) (CalBG). All the supplemental container plants and cuttings are of local genetic origin—i.e., the Santa Anita Wash / Rio Hondo subwatershed. A list of the container plants and cuttings species that were installed on the site in December 2021 is provided in Table 2.

TABLE 1
SUPPLEMENTAL SEED SPECIES – DECEMBER 2021

Supplemental Seed Species[a]	Quantity (Pounds)
Acmispon maritimus var. *maritimus*	1.04
Ambrosia psilostachya	3.00
Artemisia douglasiana	2.62
Brickellia nevinii	2.00
Clarkia bottae	0.02
Corethrogyne filaginifolia	1.28
Cryptantha intermedia var. *intermedia*	2.20
Diplacus aurantiacus	0.94
Eriogonum elongatum var. *elongatum*	1.10
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	2.86
Frangula californica ssp. *californica*	1.16
Hazardia squarrosa var. *grindelioides*	2.26
Hesperoyucca whipplei	3.30
Lupinus hirsutissimus	1.92
Lupinus truncatus	0.94
Malacothrix saxatilis	2.10
Mentzelia micrantha	0.88
Mirabilis laevis var. crassifolia	0.26
Phacelia grandiflora	2.96
Phacelia minor	1.96
Pseudognaphalium biolettii	0.12
Quercus agrifolia var. *agrifolia* [b]	4.00
Quercus engelmannii [b]	4.00
Salvia columbariae	0.66
Senecio flaccidus var. *douglasii*	3.10
Total	**46.68**

a The seed species were combined in multiple separate mixes according to seeding patch locations (e.g., oak woodland understory, coastal sage scrub slopes, drainage/riparian slopes). All supplemental seed was of local genetic origin—i.e., the Santa Anita Wash – Rio Hondo Subwatershed.
b Oak planting sites (only)

TABLE B-2
SUPPLEMENTAL CONTAINER PLANTS AND CUTTINGS – DECEMBER 2021

Scientific Name	Common Name	Collection Source Location[b]	Quantity
Juncus rugulosus	wrinkled rush	Monrovia	10
Juncus textilis	basket rush	Arcadia	10
Opuntia vaseyi	Vasey's prickly-pear (cuttings)	Arcadia	76
Pellaea andromedifolia	coffee fern	Monrovia	8
Pellaea mucronata	birds's-foot fern	Monrovia	2
Rosa californica	California rose	Monrovia	20
		Subtotal	**126**

Psomas Biologists perform nesting bird surveys associated with maintenance tasks performed by Nakae during the nesting bird season, which is defined in Project permits and authorizations as

February 1 to September 15. When sensitive biological resources are observed (e.g., nesting birds), these environmentally sensitive areas (ESAs) are marked in the field via flagging tape and/or signage. The biologist then remains on site as needed to coordinate maintenance tasks in the vicinity of these resources (to avoid adverse impacts) and to assist Nakae with native and non-native plant species identification.

Nakae regularly removes vegetation from the central portion of each drainage channel (i.e., an area approximately 2 to 3 feet in width). In addition, except for a small number of volunteer willows and sycamore trees, woody vegetation is removed from the cross section of the drainages to similarly facilitate access for inspection and maintenance. The narrow berm between the drainages is kept nearly 100 percent unvegetated to provide a footpath for perpetual access by Public Works personnel.

Psomas and Nakae monitor some erosion conditions on the off-site slopes to the east of the mitigation site (i.e., Weed Abatement Area No. 1); however, no significant erosion is present on the mitigation site, and no problematic trespassing or trash deposition has occurred in the vicinity. Nakae is maintaining the concrete down-drains and V-ditches to ensure they are clear of sediment and debris to facilitate the County's ongoing inspection of the Lower SPS' integrity.

Nakae also performs maintenance tasks in the Weed Abatement Buffer Areas (Buffer Areas) (7.38 acres, in total) that surround the mitigation site, as shown on Exhibit 3.

3.0 PERFORMANCE MONITORING – YEAR SEVEN

Mitigation monitoring tasks from spring 2021 to spring 2022 included both qualitative and quantitative assessments of mitigation performance. Qualitative surveys include an assessment of native plant species growth, reproduction, or mortality; pest problems; irrigation system performance; invasive weed species establishment; and wildlife species use (resident and migrant species). The quantitative survey methodology includes the use of transects and quadrats to measure vegetation cover and diversity and performance of oak tree assessments by a Certified Arborist. The quantitative survey methodology was prepared in coordination with the California Department of Fish and Wildlife (CDFW) and is described in detail in the OWHRMP (e.g., the quadrat sampling area constitutes at least 2.0 percent of the combined oak woodland (OW)- and coastal sage scrub (CSS)-vegetated habitat areas on the mitigation site) and summarized in the following subsections. Nesting bird surveys were performed in association with mitigation maintenance tasks, and a summary of all wildlife observations on the site is provided below. The vegetation cover and diversity values as well as the results of the oak tree assessment are discussed in Section 3.4 below.

In coordination with Public Works, a total of 0.18 acre of currently unvegetated area (access road and concrete drainages) was removed from the oak woodland mitigation site and replaced with a portion of Buffer Area 2 in 2019. The substituted oak woodland polygon (formerly a part of Buffer Area 2) includes a total of 12 coast live oak (*Quercus agrifolia* var. *agrifolia*) seedlings that were provided with protective cages in 2013 during the site preparation phase. The 0.18-acre area also includes a total of four mature coast live oak trees.

Geographic Information Systems (GIS) was used to generate random point-intercept transect locations and random vegetation quadrat locations for the measurement of native vegetation conditions (foliar cover and species diversity [richness]) on the mitigation site. Each mitigation site (CSS and OW) was subdivided into several sampling 'blocks' of equal size (see Exhibit 3) into which the quadrats and transects were separately assigned, to enable good spatial distribution of sampling within each habitat type. Psomas' Ecologist Trevor Bristle, Senior Biologist Lindsay

Messett, Senior Botanist Allison Rudalevige, and Consulting Botanist Sandy Leatherman performed the quantitative vegetation surveys on March 8 and 9, 2022. Mr. Bristle and Ms. Messett are qualified to perform nesting bird surveys (as described in the OWHRMP, which states that individual transects, or quadrats would be moved to alternate random locations as needed to avoid impacts to nesting birds). Quantitative surveys were performed during the nesting bird season, which is defined as February 1 to September 15 in Project permits and Environmental Impact Report (EIR) mitigation measures.

The quantitative surveys were performed in the spring (rather than exactly five years after the start of the ten-year maintenance period on January 1, 2015) to sample the vegetation during the period when most plant species are actively growing and most detectable.

3.1 TRANSECTS

A total of six 100-foot point intercept transects (1.0-foot intercepts) were performed on the OW mitigation site, and a total of six 50-foot point-intercept transects (1.0-foot intercepts) were performed on the CSS mitigation site. Species incidence was recorded at each transect intercept as either native or non-native species, “both”, or “no plant”; and ground cover was recorded at each intercept as either bare soil, rock/cobble, leaf litter, fine woody debris, coarse woody debris, or ‘other’ (e.g., concrete V-ditch). The transect data were compiled to yield the percent native and non-native class cover and ground cover (by category).

3.2 QUADRATS

A total of nine 20-foot by 40-foot quadrats were sampled to assess plant species density and diversity at six locations on the OW mitigation site and three locations on the CSS mitigation site. The total quadrat sampling areas were 4,800 square feet (sf) on the OW mitigation site and 2,400 sf on the CSS mitigation site, for a total quadrat sampling area of 7,200 sf. The quadrats were created using measuring tapes, wire flags, and flagging tape. The location of all transects and quadrats are shown on Exhibit 3. Vegetation characteristics were independently evaluated via quadrats for the two mitigation habitat types present on site (i.e., OW and CSS) using the following characteristics (metrics): plant species richness (number of species sampled); density of native trees (all species); density of native shrubs (all species); density, relative density, cover, relative cover, frequency, and relative frequency of each plant species; and the Shannon Diversity Index (see Section A-6.1.1) was computed to yield the species diversity for each habitat type. This index represents the sampled abundance and evenness of species in the study area. The vegetation diversity values are discussed in Section 3.4, Results, below. The metrics, equations, and variables used to derive these values are provided in Table A-10.

3.3 OAK TREE ASSESSMENT

During the Year One oak evaluation in 2015, the oak planting locations were recorded for 399 trees using a hand-held global positioning system (GPS) device, and each location (cage) was marked with a pre-numbered metal tag. In spring 2019, an additional 16 oak locations were recorded within a 0.18-acre area (slope) that was formerly a part of Weed Abatement Buffer Area 2. The oaks in the 0.18-acre area include several volunteer oak seedlings that were protected via chicken wire caging that was installed in 2013. Psomas’ Certified Arborist Trevor Bristle (International Society of Arboriculture Certificate Number WE-10233A) conducted the annual oak assessment on June 16, 17, and 24, 2022, to evaluate the 415 oak trees (i.e., 411 caged oak locations, and 4 non-caged mature oaks) and to characterize their growth and health in Year Seven. A total of three planted oak species are present on the mitigation site: coast live oak, San Gabriel oak (*Quercus durata* var. *gabrielensis*), and Engelmann oak. The following data

were collected during the evaluation: diameter at breast height (or at a lower, representative height), tree height, canopy width, health rating, and shoot elongation.

3.4 RESULTS

The plant species density and diversity results (e.g., richness, abundance) based on survey quadrats are discussed below, and a detailed table of density and diversity data (quadrats) and computations is provided in Attachment C. Percent cover data (transects) is discussed below, and detailed transect data is provided in Attachment D.

3.4.1 Native Plant Density

A summary of Year Seven native shrub/subshrub and herb density is provided in Table 2 and includes an extrapolated estimate of the number of plants per acre. A total of 153 native shrubs/subshrubs were sampled in quadrats (4,800 sf, total) on the OW site, and 166 native shrubs/subshrubs were sampled in quadrats (2,400 sf, total) on the CSS site. A total of 793 native herb plants were estimated to occur in quadrats on the OW site, and 109 native herb plants were estimated to occur in quadrats on the CSS site. The number of native shrubs (sampled) and herbs (estimated) on the mitigation site in Year Seven substantially exceeds the density of native shrubs/herbs on the reference site (2013 survey); however, it is important to note that (a) the reference site surveys were conducted in mid-July (when some native annual and perennial grasses/herbs may have already become desiccated and therefore were not sampled on quadrats/transects) and (b) 2013 was a year of sub-average rainfall, which may have influenced the expression of the native herbaceous flora. According to the terms of the OWRHMP, the reference site would have been surveyed again in Years Three (April/May 2018), Five, Seven, and Ten, concurrent with the quantitative surveys on the mitigation site, for comparative assessment with mitigation performance. However, in May 2018 the CDFW authorized Public Works to discontinue the requirement for surveys of the reference site for the duration of the maintenance period.

TABLE 2
NATIVE PLANT DENSITY – YEAR SEVEN (2022)

Habitat Type	Plant Category	Sampling Area	Native Plant Density[a]	
			Per 4,800 square feet (sf) (All Quadrats Combined)	Per 1.0 Acre
Oak Woodland	Shrubs/ Subshrubs	Reference Site (2013)[b]	42 (1 per 114.3 sf)	381
		Mitigation Site (2022)	**153 (1 per 31.4 sf)**	**1,388**
	Herbs	Reference Site (2013)[b]	7 (1 per 686 sf)	64
		Mitigation Site (2022)	**793 (1 per 6.0 sf)**	**7,196**
Habitat Type	**Plant Category**	**Sampling Area**	**Per 2,400 sf (All Quadrats Combined)**	**Per 1.0 Acre**
Coastal Sage Scrub	Shrubs/ Subshrubs	Reference Site (2013)	34 (1 per 70.6 sf)	617
		Mitigation Site (2022)	**166 (1 per 14.5 sf)**	**3,013**
	Herbs	Reference Site (2013)	21 (1 per 114.3 sf)	381
		Mitigation Site (2022)	**109 (1 per 22.0 sf)**	**1,978**

[a] Includes seedlings
[b] California Sycamore/Coast Live Oak Riparian Forest; see Exhibit 2 for reference site location.

The OW and CSS mitigation sites were designed to exhibit a mosaic of understory vegetation types with a moderate to high density of shrubs in some areas. By design, the CSS site exhibits

a higher density of shrubs than the OW site, and the OW site exhibits large polygons of herbaceous/meadow vegetation with plantings of oak and scattered shrubs. The high density of native herbs on the oak woodland mitigation site reflects the establishment of a high quality, native vegetative understory in comparison to the reference site.

3.4.2 Native Plant Frequency

A summary of Year Seven native plant frequency sampled on quadrats (only) is provided in Table 3. Herbaceous species were well represented across all quadrats and transects; however, the absolute cover of herbaceous species was lower in Year Seven than in Year Six due to drought, as described in Sections 1.0 and 3.4.3.

TABLE 3
NATIVE PLANT FREQUENCY – YEAR SEVEN (2022)

No. Quadrats (20 feet by 40 feet)	Sampled Plant Species
Oak Woodland Mitigation Site (6 Quadrats)	
6 of 6	*Quercus agrifolia* var. *agrifolia*
5 of 6	*Phacelia ramosissima*
4 of 6	*Eriogonum fasciculatum* var. *foliolosum, Ribes aureum* var. *gracillimum*
3 of 6	*Stipa lepida*
2 of 6	*Heterotheca grandiflora, Pellaea andromedifolia, Phacelia distans, Sambucus nigra* ssp. *caerulea, Solanum douglasii*
1 of 6	15 species (not listed due to table size limitations)
Coastal Sage Scrub Mitigation Site (3 Quadrats)	
3 of 3	*Artemisia californica, Camissoniopsis hirtella, Eriogonum fasciculatum* var. *foliolosum, Hesperoyucca whipplei*
2 of 3	*Opuntia vaseyi*
1 of 3	10 species (not listed due to table size limitations)

3.4.3 Vegetation Percent Cover

A summary of Year Seven vegetation percent cover is provided in Tables 4 and 5. The detailed computations of vegetation percent cover are provided in Attachments C and D.

TABLE 4
VEGETATION PERCENT COVER: OAK WOODLAND – YEAR SEVEN (2022)

Plant Species	Year Seven Results[a] (*Final Standard Currently Met or Exceeded)			Minimum Cover Per Vegetation Class/Year			
	Quadrats	Transects	Average	3	5	7	10
Native							
Trees							
Quercus agrifolia var. *agrifolia*	9.18	7.67	8.43	0.5[b]	1[b]	1.5[b]	2[b]
Subtotal – Oak Tree Species	**9.18**	**7.67**	**8.43***				
Sambucus nigra ssp. *caerulea*	0.67	0.17	0.42				
Subtotal – All Trees	***9.85***	***7.84***	***8.85***				
Large Shrubs							
Baccharis pilularis ssp. *consanguinea*	3.33	0.00	1.67				
Baccharis salicifolia ssp. *salicifolia*	10.17	2.83	6.50				
Ceanothus crassifolius	0.17	0.00	0.08				
Ceanothus leucodermis	2.50	0.00	1.25				
Ceanothus oliganthus	0.00	0.17	0.09				
Heteromeles arbutifolia	0.17	0.00	0.08				
Malosma laurina	0.83	1.33	1.08				
Rhus ovata	0.00	3.00	1.50				
Subtotal – Large Shrubs	***17.17***	***7.33***	***10.75****	3	4	5	5
Medium Shrubs							
Artemisia californica	2.00	8.50	5.25				
Brickellia californica	0.17	0.00	0.08				
Encelia californica	1.67	0.00	0.83				
Eriogonum fasciculatum var. *foliolosum*	7.00	19.33	13.17				
Rhus aromatica	0.33	0.00	0.17				
Ribes aureum var. *gracillimum*	1.33	0.00	0.67				
Rosa californica	0.17	0.00	0.08				
Rubus ursinus	0.00	1.17	0.59				
Salvia apiana	0.00	0.33	0.17				
Salvia mellifera	0.00	4.33	2.17				
Subtotal – Medium Shrubs	***12.67***	***33.67***	***23.17****	14	16	18	18
Subshrubs							
Acmispon glaber var. *glaber*	4.00	4.67	4.34				
Subtotal – Subshrubs	***4.00***	***4.67***	***4.34***	3	4	5	5
Spiniferous[c]							
Hesperoyucca whipplei	0.00	1.33	0.67				
Opuntia vaseyi	0.50	0.33	0.42				
Subtotal – Spiniferous	***0.50***	***1.66***	***1.08***	0.5	1	2	2
Herbs							
Acmispon americanus var. *americanus*	0.03	0.5	0.27				
Amsinckia menziesii	0.02	0.00	0.01				
Artemisia douglasiana	5.00	0.50	2.75				
Calystegia macrostegia	0.02	0.00	0.01				
Camissoniopsis hirtella	0.35	0.50	0.43				
Cardamine oligosperma	0.02	0.17	0.09				
Chaenactis glabriuscula	0.02	0.00	0.01				
Clarkia purpurea ssp. *quadrivulnera*	0.40	5.83	3.12				
Crassula connata ssp. *lamprosperma*	0.00	2.00	1.00				
Cyperus eragrostis	0.85	0.17	0.51				
Elymus condensatus	0.67	1.67	1.17				
Epilobium brachycarpum	0.18	0.17	0.18				
Eriogonum elongatum	0.33	0.00	0.17				
Eucrypta chrysanthemifolia	0.02	0.00	0.01				
Eulobus californica	0.02	0.00	0.01				
Helianthus annuus	0.00	0.33	0.17				
Heterotheca grandiflora	0.03	0.00	0.02				
Juncus textilis	0.17	0.00	0.08				
Juncus xiphioides	0.17	0.00	0.08				
Leptochloa fusca	0.33	0.67	0.50				
Lupinus hirsutissimus	0.02	0.00	0.01				
Marah macrocarpa	0.00	0.83	0.42				
Oenothera elata	0.17	0.00	0.08				
Pellaea andromedifolia[d]	0.03	0.17	0.10				
Phacelia distans	0.03	0.00	0.02				
Phacelia ramosissima	0.38	4.17	2.28				
Pseduognaphalium stramineum	0.17	0.00	0.08				
Solanum americanum	0.00	0.17	0.09				
Solanum douglasii	0.18	0.00	0.09				
Stipa lepida	0.20	0.83	0.52				
Subtotal – Herbs	***9.82***	***18.68***	***14.25***	25	30	30	30

TABLE 4
VEGETATION PERCENT COVER: OAK WOODLAND – YEAR SEVEN (2022)

Plant Species	Year Seven Results[a] (*Final Standard Currently Met or Exceeded)			Minimum Cover Per Vegetation Class/Year			
	Quadrats	Transects	Average	3	5	7	10
Non-Native							
Anthriscus caucalis	0.02	0.00	0.01				
Bromus diandrus	0.02	0.67	0.34				
Bromus rubens	0.33	2.33	1.33				
Centaurea melitensis	0.02	0.00	0.01				
Erodium cicutarium	0.20	0.17	0.19				
Euphorbia peplus	0.18	0.17	0.18				
Festuca myuros	3.90	3.50	3.70				
Medicago polymorpha	0.02	0.00	0.01				
Melilotus sp.	0.00	0.17	0.09				
Poa annua	0.02	0.00	0.01				
Schismus barbatus	0.02	0.00	0.01				
Unspecified Non-Native Grasses (Mowed)	0.00	2.33	1.17				
Unspecified Non-Native Grasses (Non-mowed)	0.00	2.67	1.34				
Subtotal – Non-Native	***4.72***	***12.01***	***8.36***				
Absolute Percent Cover							
Total Absolute Native Species Cover	**54.00**	**73.85**	**63.92**				
Total Absolute Non-Native Species Cover	**4.72**	**12.01**	**8.36**				
Total Absolute Cover (All)	**58.72**	**85.86**	**72.29**				
Class Percent Cover							
Native		52.17					
Non-Native		9.50					
Both		8.00					
No Plant		30.33					
Summary							
Total Native Class Cover		**60.17**		55	75	75	75
Total Non-Native Class Cover		**17.50**		5.0[e]	5.0[e]	5.0[e]	5.0[e]
Total Unvegetated		**30.33**					
Ground Cover (No Performance Standard)							
Bare Soil	10.50	10.83	**10.67**				
Boulder/Rock/Cobble	7.50	1.83	**4.67**				
Leaf Litter	46.33	33.00	**39.67**				
Fine Woody Debris	27.50	47.67	**37.58**				
Coarse Woody Debris	6.00	3.00	**4.50**				
Moss[f]	0.00	1.00	**0.50**				
PVC Pipe	2.17	1.17	**1.67**				
Sand Bag	0.00	1.50	**0.75**				

[a] Quadrats: Estimated cover (mean); Transects: Measured cover (mean).
[b] Includes only oak tree species
[c] Category described as 'succulents' in the *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal* Project (Psomas 2016).
[d] A native fern species (see Section 3.4.3)
[e] The ongoing maximum allowed cover of non-native plant species is 5%.
[f] Although the 'moss' data type represents living, biotic material (a non-vascular plant), it was not included in the vascular plant coverage summary and was instead described in terms of its *physical* properties as ground cover (substrate).

Note: Totals may not add due to rounding.

TABLE 5
VEGETATION PERCENT COVER: COASTAL SAGE SCRUB – YEAR SEVEN (2022)

Plant Species	Year Seven Results[a] (*Final Standard Currently Met or Exceeded)			Minimum Cover Per Vegetation Class/Year			
	Quadrats	Transects	Average	3	5	7	10
Native							
Large Shrubs							
Baccharis salicifolia ssp. *salicifolia*	0.00	3.00	1.50				
Heteromeles arbutifolia	0.00	3.33	1.67				
Malosma laurina	5.00	0.00	2.50				
Rhus ovata	0.67	0.00	0.34				
Subtotal – Large Shrubs	***5.67***	***6.33***	***6.00****	2	3	4	5
Medium Shrubs							
Artemisia californica	9.33	13.33	11.33				
Encelia californica	0.00	2.67	1.34				
Eriogonum fasciculatum var. *foliolosum*	33.33	47.33	40.33				
Salvia mellifera	0.03	2.67	1.35				
Subtotal – Medium Shrubs	***42.69***	***66.00***	***54.35****	24	28	35	50
Subshrubs							
Acmispon glaber var. *glaber*	3.33	2.67	3.00				
Subtotal – Subshrubs	***3.33***	***2.67***	***3.00***	2	3	4	5
Spiniferous[b]							
Hesperoyucca whipplei	1.00	3.00	2.00				
Opuntia vaseyi	3.67	0.67	2.17				
Subtotal – Spiniferous	***4.67***	***3.67***	***4.17****	0.5	1	2	2
Herbs							
Camisoniopsis hirtella	0.40	0.00	0.20				
Clarkia purpurea var. *quadrivulnera*	0.03	0.00	0.02				
Datura wrightii	0.00	2.00	1.00				
Eriogonum elongatum var. *elongatum*	3.33	0.00	1.67				
Eulobus californicus	0.03	0.00	0.02				
Heterotheca grandiflora	0.00	0.00	0.00				
Lupinus hirsutissimus	0.03	0.00	0.02				
Marah macrocarpa	0.03	2.33	1.18				
Phacelia distans	0.03	0.00	0.02				
Phacelia ramosossima	0.00	0.33	0.17				
Solanum douglasii	0.00	0.00	0.00				
Subtotal – Herbs	***3.88***	***4.66***	***4.07***	8	10	15	15
Non-Native							
Bromus diandrus	0.10	0.00	0.05				
Bromus rubens	0.03	0.33	0.18				
Erodium cicutarium	0.33	0.67	0.50				
Festuca myuros (Mowed and Non-mowed)	6.70	0.00	3.35				
Hypochaeris glabra	0.03	0.00	0.02				
Schismus barbatus	0.03	0.00	0.02				
Unspecified Non-Native Grasses	0.00	1.00	0.50				
Subtotal – Non-Native	***7.22***	***2.00***	***4.61***				
Absolute Percent Cover							
Total Absolute Native Species Cover	**60.27**	**83.33**	**71.80**				
Total Absolute Non-Native Species Cover	**7.23**	**2.00**	**4.62**				
Total Absolute Cover (All)	**67.50**	**85.33**	**76.42**				
Class Percent Cover							
Native		69.00					
Non-Native		1.67					
Both		0.33					
No Plant		29.00					
Summary							
Total Native Class Cover		**69.33**		55	75	75	75
Total Non-Native Class Cover		**2.00***		5.0[c]	5.0[c]	5.0[c]	5.0[c]
Total Unvegetated		**29.00**					
Ground Cover (No Performance Standard)							
Bare Soil	16.67	5.67	**11.17**				
Boulder/Rock/Cobble	1.67	0.00	**0.84**				
Leaf Litter	66.67	11.00	**38.84**				
Fine Woody Debris	10.00	73.67	**41.84**				
Coarse Woody Debris	3.33	0.33	**1.83**				
Moss[d]	0.00	1.33	**0.67**				
PVC Pipe	2.50	1.00	**1.75**				
Concrete Drainage	0.00	7.00	**3.50**				

[a] Quadrats: Estimated cover (mean); Transects: Measured cover (mean)
[b] Category described as 'succulents' in the *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project* (Psomas 2016).
[c] The ongoing maximum allowed cover of non-native plant species is 5%.
[d] Although the 'moss' data type represents living, biotic material (a non-vascular plant), it was not included in the vascular plant coverage summary and was instead described in terms of its *physical* properties as ground cover (substrate).

Note: Totals may not add due to rounding.

The vegetation percent cover values for the transects and the quadrats were combined to calculate the average values of the two sampling methods. The vegetation class cover performance is based only on the transect data which is wholly measured, whereas the quadrat data is partly estimated. The point intercept transect data do not necessarily reflect individual plant occurrences (i.e., a single plant [large tree, shrub] may be intersected multiple times on a single transect). Photos of all quadrat and transect locations are provided in Attachment B.

As measured via transects, the native vegetation class cover is 60.17 percent on the OW mitigation site and 69.33 percent on the CSS mitigation site; the non-native vegetation class cover is 17.50 percent on the OW mitigation site and 2.00 percent on the CSS mitigation site. The final (Year Ten) performance standard is 75 percent native vegetation cover (OW and CSS); therefore, the OW and CSS sites are below this standard. Some of the non-native weedy grasses and non-native broadleaf herbs (that were sampled) were in the process of being removed by Nakae at the time of the seventh annual survey. This included numerous patches of non-native rattail sixweeks grass (*Festuca myuros*, an annual weed) that had been mowed and prevented from ripening and dispersing seed but were still green at the time of the quantitative survey and were therefore counted as non-native cover. The non-native cover that was observed later in the growing season (summer to early fall) was substantially lower than in April/May 2022, as the contractor was able to 'catch up' with the seasonal weed growth.

As noted above, the Los Angeles County Board of Supervisors banned the use of glyphosate-based herbicides on Los Angeles County properties on March 19, 2019, and Public Works suspended the use of all herbicides on the mitigation site on April 18, 2019. Consequently, all weed control after March 19, 2019, was performed via manual methods (i.e., via hand-pulling, the use of hand tools, and/or equipment such as string trimmers). Also, due to restricted access for maintenance (by Nakae) to the ESAs (multiple nesting bird locations established by Psomas' Biologists), some weeds in these no-entry areas unavoidably mature and disperse seed each year, increasing nearby weed germination and growth in subsequent months/years. For the reasons described above, the mitigation sites (OW and CSS) were substantially above the maximum allowed non-native plant cover of 5 percent, despite the performance of regular maintenance tasks.

The absolute cover of all oak tree species sampled via quadrats/transects is 8.43 percent on the OW mitigation site. The estimated total canopy area of oak tree species resulting from the oak tree assessment was 8.04 percent. As described in Section 3.4.5, the value of 8.04 percent is being used to assess compliance with performance standards. The OW site has substantially exceeded the final (Year Ten) performance standard of 2 percent minimum cover of oak tree species.

The absolute cover of large shrubs (8 sampled species combined OW and CSS [all categories below]) is 7.33 percent on the OW mitigation site and 6.33 percent on the CSS mitigation site. The absolute cover of medium shrubs (10 species) is 33.67 percent on the OW mitigation site and 66.00 percent on the CSS mitigation site. The absolute cover of subshrubs (1 species) is 4.67 percent on the OW mitigation site and 2.67 percent on the CSS mitigation site. The absolute cover of spiniferous shrubs (2 species) is 1.66 percent on the OW mitigation site and 3.67 percent on the CSS mitigation site. The spiniferous shrub category includes Whipple's chaparral yucca and Vasey's prickly-pear (*Opuntia vaseyi*). The absolute cover of native grasses/herbs (32 species) is 18.68 percent on the OW mitigation site and 4.66 percent on the CSS mitigation site. The absolute cover of native fern species was 0.17 percent on the OW site; however, planted ferns were observed in numerous locations (associated with placed boulders or CWD) in Year Seven. The Year Seven performance meets or exceeds the final performance standards for some of these vegetation categories.

CWD was sampled at 3.00 percent cover and rock/cobble (boulders) was sampled at 1.83 percent cover on the OW mitigation site. Beneficial decay processes, including the growth of fungi (several species), have been observed in the CWD assemblages; wildlife species are intensively colonizing these habitat features. These decay processes naturally occur in woodland habitats as a part of biological resource nutrient cycles. It is important to note that without the installation of the salvaged woody material, such processes would not otherwise occur on an oak habitat creation/restoration site for many years.

3.4.4 Native Plant Diversity

A total of 55 native plant species and 14 non-native plant species were sampled by quadrats and/or transects performed on the OW and CSS mitigation sites. The mitigation program has far exceeded the final (Year Ten) performance standard for native plant species richness on the OW mitigation site (minimum 24 species required; 54 species sampled in Year Seven), and the native plant species richness on the CSS site (minimum 18 species required; 22 sampled species in Year Seven), as listed in Tables 4 and 5. A total of 151 native plant species have been observed on the 8.0-acre mitigation site, and 36 percent of these plant species were sampled on quadrats and/or transects in Year Seven.

As described in Attachment A-6.1.1, the reference sites exhibited vanishingly low values of 'H' (Shannon Diversity Index) in 2013, due to the high degree of invasion by non-native grasses that is typical of natural habitats in the region. Due to assertive weed control and the establishment of highly diverse vegetative cover, the mitigation sites are expected to continue to exhibit significantly higher diversity than the reference site. A summary of the Year Seven values of 'H' on the mitigation sites is listed in Table 6.

TABLE 6
SHANNON DIVERSITY INDEX – YEAR SEVEN (2022)

Habitat Type	Sampling Area	Number of Plant Species[a]		Shannon Diversity Index = H[a]	
		Native	Non-Native	Result	Potential[b]
Oak Woodland	Reference Site (2013)[c]	18	11	0.01	3.37
	Mitigation Site (2022)	**54**	**13**	**2.49[d]**	**4.01**
Coastal Sage Scrub	Reference Site (2013)	19	6	0.03	3.22
	Mitigation Site (2022)	**22**	**7**	**0.84[d]**	**3.09**

[a] Based on quadrat data.
[b] Based on the number of plant species (native + non-native) sampled.
[c] CS/CLORF: California Sycamore/Coast Live Oak Riparian Forest; see Exhibit 2 for reference site location.
[d] Final standard currently met or exceeded.

3.4.5 Oak Performance

A total of 364 living oak plants occur in planting cages on the 5.5-acre oak mitigation site, and only these caged/tagged oaks were evaluated during the survey. A total of 12 of the 364 living oak plants represent new seedlings (within planting cages) arising from supplemental acorn sowing at several individual planting locations. In addition to the 411 caged oak plantings, numerous additional planted and volunteer oaks (>100 saplings/seedlings, and 4 larger/pre-existing oaks) occur on the mitigation site, not associated with planting cages, comprising a substantial contingency. The mean trunk diameter (sum of two largest stems) for all measured oak species in Year Seven is 2.35 inches. Based on the assessments, the total canopy area for all oak species is 21,118.08 sf. The total canopy area for planted oak tree species *only* (excluding

[a] San Gabriel Oak, a shrub species, and [b] four mature oaks, per above) is 19,252.76 sf (or 8.04 percent cover of oak tree species on the 5.5-acre oak mitigation site) as derived from estimated canopy diameter data, where $A = \pi r^2$ (A = area; π = 3.1416; r = radius). This value (8.04 percent) is slightly lower than the mean oak tree cover value (8.43 percent) obtained during quadrats and transects on the OW site. Because it is based on the individual evaluation of all caged oak tree species, the value of 8.04 percent is considered a more accurate representation of oak tree cover (versus the quadrat/transect data) in assessing compliance with the performance standard. The estimated mean height of all planted oak species is 9.97 feet in Year Seven, with a total of 221 (61 percent) of the planted oaks being at least 10 feet in height, and 139 oaks (38 percent) being at least 12 feet in height.

A total of 363 oak plants were proposed in the OWHRMP, and there is an 80-percent survival performance criterion (per CDFW) based on that quantity of oaks (i.e., there shall be a minimum of 290 surviving oaks at the end of the seven-year to ten-year maintenance period). Therefore, the Year Seven oak survival performance (364 oak trees) far exceeds the performance criterion. A summary of the size distribution of the assessed oak species is provided in Table 7, and all collected tree data is provided in Attachment E.

The overall health of each oak plant (*Quercus* spp.) was rated on a scale of 1 to 5 as described in Table 7 (per the OWHRMP). The health of almost all oaks in Year Seven is very good, with a mean health rating of 3.79. Living oak trees occur in 364 of the 411 cages; however, as noted above, numerous other living oak plants occur on the mitigation site. No serious pathogens, such as *Phytophthora* spp. or invasive shot hole borer (*Euwallacea* spp.)/*Fusarium* sp. die-back, were identified on the trunks/stems/leaves of the planted oaks during the assessment.

Some thinning of oak plants was performed in July 2018 toward achieving the best density of oak species on the mitigation site. The thinning tasks were performed by Nakae under the direction of Psomas' Certified Arborist, following the performance of a nesting bird survey. The OWHRMP specified that acorns would be collected and planted on the mitigation site annually for the first five years of the maintenance program. However, as noted in the second Annual Monitoring Report, acorn production in the local subwatershed was observed to be very low in fall 2016, so no acorn collection was performed in Year Two to allow for oak regeneration (of the pre-existing stands) and to retain the year's scarce acorns for wildlife forage. Locally collected acorns were collected in fall 2017, including approximately 1 pound of coast live oak acorns and approximately 3 pounds of Engelmann oak acorns. An additional 2 pounds of Engelmann oak acorns were collected and planted on site in fall 2018, and again in fall 2019. A total of 2 pounds of coast live oak acorns were installed on the site in fall 2020. As noted in Section 2.0, Psomas collected a total of four pounds of acorns of coast live oak (*Quercus agrifolia* var. *agrifolia*) and Engelmann oak (*Quercus engelmannii*) from multiple heritage trees in the local Santa Anita Wash – Rio Hondo subwatershed and planted the acorns on the oak woodland mitigation site in fall 2021. As noted in Attachment A-3.1, the Engelmann oak acorns were obtained from public rights-of-way in developed areas in the local subwatershed (i.e., from roadway gutters) when observed beneath massive 'heritage' trees of this species (i.e., specimens assumed to be naturally occurring). The Engelmann oak acorns were carefully stored, following the guidelines of the University of California Integrated Hardwood Range Management Program (McCreary and McPherson 2005), until being planted on the mitigation site in January 2018, December 2018, November 2019, and December 2021.

TABLE 7
OAK SIZE DISTRIBUTION AND COVER – YEAR SEVEN (2022)

Planted Oak Species[a]	No. of Plants[a]/Diameter Class (inches)[b]							Total	Mean Trunk Diameter (inches)[a]	Mean Height (feet)[a]	Approx. Canopy Area (square feet)[c]		Mean Health Rating[d]
	<0.25	0.25 – 0.49	0.50 – 0.65	0.75	1.0 – 2.0	2.25 – 3.5	3.75+				Mean	Total	
coast live oak (*Quercus agrifolia* var. *agrifolia*)	8	9	16	13	75	148	65	**334**	2.53	10.49	55.79	18,968.83	3.83
San Gabriel oak (*Quercus durata* var. *gabrielensis*)	1	2	0	0	1	0	0	**4**	0.46	2.50	3.93	15.71	3.25
Engelmann oak (*Quercus engelmannii*)	4	13	2	1	6	0	0	**26**	0.56	5.08	10.92	283.92	3.58
All Planted *Quercus* spp.	**13**	**24**	**18**	**14**	**82**	**148**	**65**	**364**	**2.35**	**9.97**	**52.61**	**19,268.45**	**3.79**
All Planted Oak Tree Species[e]									**2.38**	**10.10**			**3.81**

[a] Includes only the oaks occurring inside planting cages (there are numerous other planted/volunteer oaks occur on the mitigation site).
[b] Sum of the two largest trunks. The diameter at breast height (dbh, stem/trunk diameter) is measured at 4.5 feet above ground level (or at a lower, representative height).
[c] Based on estimated tree canopy diameter, where $A = \pi r^2$ (A = area; π = 3.1416; r = radius).
[d] Health ratings: 5 = Excellent; 4 = Very Good; 3 = Moderate; 2 = Poor; 1 = Obvious Decline.
[e] Excludes *Quercus durata* var. *gabrielensis* (a shrub species).

3.4.6 Wildlife Species

Hundreds of vertebrate wildlife species and even more numerous species of arthropods/insects use OW habitats in California (Tietje et al. 2005). A greater abundance and diversity of wildlife species are found in woodlands that include a high density of CWD (e.g., snags, downed wood, brush piles) because CWD provides nesting/perching/shelter opportunities. CWD also provides for beneficial decay processes associated with these habitat features that returns nutrients to the habitat. The mitigation site was designed to incorporate a large volume of rock and woody material and a large variety of native plant species to immediately provide high wildlife value. The 8.0-acre mitigation site contains a range of habitat conditions, from dry slopes to moist north-facing slopes and created drainages, offering varied resources for wildlife.

Psomas employs a range of wildlife specialists (e.g., herpetologists, ornithologists, mammalogists) who work alongside the vegetation specialists (e.g., arborists, botanists) and the licensed restoration contractor (Nakae), contributing their hundreds of years of combined field experience and unique expertise to the design and long-term monitoring of the habitat creation site (e.g., the selection and landscape configuration of optimal salvaged native tree trunks to be used for the placed snags and the arrangement of boulders to resemble outcrops resulting from natural geological processes). As noted above, nesting bird surveys are conducted in association with maintenance activities performed during the nesting bird season, and biological resources are monitored/protected in compliance with the CDFW Streambed Alteration Agreement and EIR Mitigation Measures. Wildlife observations are recorded on a year-round basis during supplemental planting and seeding tasks, qualitative monitoring inspections, and annual quantitative surveys (i.e., quadrats/transects and oak evaluations).

A total of 15 species of native birds have been observed nesting on the mitigation site to date, including killdeer (*Charadrius vociferous*), mourning dove (*Zenaida macroura*), acorn woodpecker (*Melanerpes formicivorus*), ash-throated flycatcher (*Myiarchus cinerascens*), Cassin's kingbird (*Tyrannus vociferans*), bushtit (*Psaltriparus minimus*), house wren (*Troglodytes aedon*), Bewick's wren (*Thyromanes bewickii*), blue-gray gnatcatcher (*Polioptila caerulea*), California thrasher (*Toxostoma redivivum*), northern mockingbird (*Mimus polyglottos*), phainopepla (*Phainopepla nitens*), common yellowthroat (*Geothlypis trichas*), rufous-crowned sparrow (*Aimophila ruficeps*), and California towhee (*Melozone crissalis*). Acorn woodpeckers nested in cavities in the placed snags in multiple years since they were installed on the site. Woodpeckers are also caching acorns in several of the placed snags. California ground squirrels (*Otospermophilus beecheyi*), rock wrens (*Salpinctes obsoletus*), native reptiles (including striped whipsnake [*Coluber taeniatus*], a snake species), raptors, and other wildlife species are increasingly colonizing the created boulder and woody debris piles and perching on the installed snags. Baja California treefrogs (*Pseudacris hypochondriaca*) have been observed breeding in the created drainages. A total of 115 native vertebrate wildlife species (95 native bird species) have been observed on the mitigation site, in addition to numerous native invertebrate species (e.g., Southern California shoulderband [*Helminthoglypta tudiculata*], blue mud wasp [*Chalybion* sp.], green lynx spider [*Peucetia viridans*], variegated meadowhawk [*Sympetrum corruptum*]) since mitigation installation began in September 2013.

Psomas operates several 'camera traps' (motion-activated video cameras) at various locations on the mitigation site to provide 24-hour wildlife observation data. Public Works installed the camera traps on a voluntary basis to enhance wildlife values and monitoring on the site. Large mammals including mountain lion (*Puma concolor*), southern mule deer (*Odocoileus hemionus*), and black bear (*Ursus americanus*) have been observed using the two drinker tanks that were installed at the northeast of the Lower SPS. The camera traps have enabled the detection of previously unobserved wildlife species on the mitigation site such as bobcat (*Lynx rufus*) and

common gray fox (*Urocyon cinereoargenteus*). The compendia of all native plant and wildlife species observed on the site are provided in Attachments F and G.

4.0 CONCLUSION

As of July 2022 (7.5 years after the completion of mitigation installation), the OW and CSS sites support an excellent diversity of plant species and are developing varied vegetation structure (vertical stratification) and cover (horizontal/mosaic). A total of 151 native plant species have been observed on the site, including trees, shrubs, subshrubs, vines, spiniferous shrubs (i.e., cactus, yucca), herbs, grasses, ferns, spike-moss, and emergent plant species. Oak tree seedling/sapling occurrence on the mitigation site exceeds 100 percent of the initial oak planting quantities (specified in the OWHRMP) due to the germination of supplementally seeded and volunteer oaks on the site. Approximately 61 percent of the planted oak saplings now exceed 10 feet in height, and approximately 38 percent of the planted oaks now exceed 12 feet in height. The oaks exhibit overall good health, despite drought conditions during portions of the maintenance period, as determined by a Certified Arborist. The sampled vegetation cover and diversity already exceed several of the final (Year Ten) performance standards. Irrigation of the OW site was discontinued in October 2018, and no irrigation has been applied to the CSS planting areas (SPS slopes) since June 2015.

Wildlife species diversity and abundance is exceptionally high (including 115 native vertebrate species) at the 7.5-year mark, not only due to vegetative cover and diversity, but also due to the large volume of coarse woody debris (including placed natural snags) and boulder assemblages that were installed on the site in 2013. A total of 15 native bird species have nested on the site, including multiple years in which acorn woodpeckers nested in cavities in the placed snags. Wildlife species are increasingly colonizing the naturalistic debris piles on the site. Native arthropods are increasingly observed on the site, including a variety of bees, beetles, butterflies, and other insect species. Wildlife use of the mitigation site to date has exceeded all expectations of the mitigation planning/implementation team.

The temporary exclosure fence will remain in place until the planted oaks (and other vegetation) are sufficiently established to withstand herbivory and trampling by large mammals (i.e., deer and bears). Public Works and its consultants/contractors will continue to assertively maintain and monitor the habitat creation site in compliance with Project permits and authorizations.

5.0 REFERENCES

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ATTACHMENT A

MITIGATION PROGRAM BACKGROUND

A-1.0 SEDIMENT REMOVAL PROJECT DESCRIPTION

The Santa Anita Dam Riser Modification and Sediment Removal Project (hereinafter referred to as the "Project") involved the removal of sediment from the Santa Anita Dam and Reservoir and the construction of a riser on the dam's lowest outlet. The sediment removed by the Project was placed on the Middle and the Lower areas of the Santa Anita Sediment Placement Site (SPS; Middle SPS and Lower SPS, respectively) located downstream in the City of Arcadia (Exhibits 1 and 2). The Lower SPS was already partially constructed (i.e., it had previously placed sediment) at the time of Project implementation, and the sediment placed on the Lower SPS by the Project filled the Lower SPS up to its designed capacity (closure) in 2012. Residential development is located to the east, west, and south of the Lower SPS; and natural open space areas (extending into the Angeles National Forest) are located to the north of the SPS.

A-1.1 IMPACT AND MITIGATION SUMMARY

A-1.1.1 Project Impacts

The Project included the removal of approximately 11 acres of native vegetation on the Middle SPS in preparation for sediment placement activities. The vegetation impacted on the Middle SPS included California sycamore/coast live oak riparian forest (CS/CLORF) and coastal sage scrub (CSS) habitat. In addition, approximately 0.5 acre of planted vegetation was removed along the eastern edge of the Lower SPS. The Project impacted a total of 177 coast live oaks (*Quercus agrifolia* var. *agrifolia*), one scrub oak (*Quercus berberidifolia*), and one Engelmann oak (*Quercus engelmannii*). A summary of Project impacts and required mitigation is provided in Table A-1.

TABLE A-1
PROJECT IMPACTS AND REQUIRED MITIGATION

Vegetation Type	Project Impacts	Required Mitigation[a]
Oak woodland and sage scrub	11 acres (approximate)	On-site habitat creation at the current 8.0-acre Lower SPS, including 5.5 acres of oak woodland creation and 2.5 acres of sage scrub revegetation.
		Permanent protection of 6.9 acres of high-quality, mature sycamore woodland and alluvial scrub habitat located off site at the Big Tujunga Mitigation Bank.[b]
		Purchase and permanent preservation of 4.9 acres of mature oak woodland habitat located in an adjacent, off-site tributary to the Project site.[b]

SPS: Sediment Placement Site; CDFW: California Department of Fish and Wildlife

[a] Specified in the CDFW Streambed Alteration Agreement No. 1600-2008-0173-R5.
[b] The detailed terms and conditions, as well as the current status of the off-site components of the mitigation program are not addressed in this document.

A-1.1.2 Project Mitigation

The creation of oak woodland (OW) (5.5 acres) and sage scrub habitat (CSS revegetation, 2.5 acres) is required by Mitigation Measures BIO-D and BIO-E in Public Works' 2009 *Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project Final Environmental Impact Report* and by the Streambed Alteration Agreement (SAA, No. 1600-2008-0173-R5), which was granted by the California Department of Fish and Wildlife (CDFW) in 2009.

A total of 8.0 acres of habitat is being created on the Lower SPS as a component of the Project's mitigation requirements (Exhibit 3). The overall mitigation program also includes (1) the permanent protection of 6.9 acres of high-quality, mature sycamore woodland and alluvial scrub habitat at Public

Works' Big Tujunga Wash Mitigation Area site (off site) and (2) the purchase and permanent preservation of 4.9 acres of mature OW habitat located in an adjacent, off-site tributary to the Project site. The detailed terms and conditions of the mitigation program's off-site components are addressed in the CDFW Agreement. Note that the Annual Monitoring Report for the Oak Woodland Habitat Revegetation/Mitigation Program only addresses the current status of the 8.0 acres of habitat being created in the Lower SPS, and it does not address current conditions in either of the off-site mitigation components. The conditions of the Big Tujunga Wash Mitigation Area component are discussed in Public Works' annual reports for that site, copies of which Public Works annually provides to CDFW. The conditions of the off-site tributary property are discussed in Public Works' triennial reports to CDFW for the site.

Mitigation program implementation tasks are summarized herein and include preliminary mitigation tasks and plant materials procurement/installation. Long-term maintenance and monitoring tasks are addressed in the foregoing seventh Annual Monitoring Report for the Oak Woodland Habitat Revegetation/Mitigation Program (to which Attachment A pertains).

A-1.1.3 Responsible Parties

Successful mitigation program implementation involves the cooperative efforts of Public Works and its team of consultants/contractors/vendors. Public Works also coordinates with the CDFW and the City of Arcadia to inform them of the status of mitigation activities and the need for any adaptive management actions. Public Works retained Psomas (Restoration Ecologist) to prepare the Oak Woodland Habitat Revegetation/Mitigation (OWHRMP) document in 2009 (including the performance of reference site surveys), to participate in community outreach efforts related to the OWHRMP, to provide biological monitoring and documentation services, and to implement the mitigation program. Psomas retained the following subcontractors/vendors: (1) S&S Seeds, Inc. (S&S) to collect site-specific native seeds (including oak acorns) and cuttings (e.g., cactus pads) in the Santa Anita Wash/Rio Hondo Subwatershed (started in 2011); (2) El Nativo Growers (ENG) and California Botanic Garden (formerly Rancho Santa Ana Botanic Garden) (CalBG) to collect ferns and rare oaks and to propagate native container plants (started in 2012); (3) Cornerstone Studios, Inc. (Landscape Architect) to prepare irrigation plans and photo simulations for the mitigation site (2013); (4) Nakae & Associates, Inc. (Nakae) to perform mitigation site preparation, installation, and long-term maintenance tasks; and (5) Leatherman BioConsulting, Inc. to provide supplemental botanical surveys and monitoring. A list of responsible parties is provided in Table A-2.

TABLE A-2
RESPONSIBLE PARTIES

Task/Role	Responsible Parties			
	Entity/Company	**Contact/Email**	**Address**	**Phone Number**
Project Applicant	Los Angeles County Public Works	Maria Lee, P.E. MarLee@dpw.lacounty.gov	900 South Fremont Avenue Alhambra, California 91802	626.458.6126
Environmental Impact Report	EDAW, Inc. (AECOM) for Los Angeles County Public Works		999 Town and Country Road Orange, California 92868	714.567.2400
Section 1600 Permitting; Mitigation Program Review/Approval	CDFW	David Lin David.Lin@wildlife.ca.gov	3030 Old Ranch Parkway, Suite 400 Seal Beach, CA 90740	562.619.0509
Mitigation Program Review/Approval	City of Arcadia Public Works Services Department	Paul Cranmer PCranmer@ci.arcadia.ca.us	P.O. Box 60021 Arcadia, California 91066-6021	626.574-5400
Vector Control: Inspection/Treatment	San Gabriel Valley Vector Control District		1145 North Azusa Canyon Road West Covina, California 91790	626.814.9466
Off-Site Seed Collection Access (Right-of-Entry Permit Grantors; Voluntary)	City of Monrovia Department of Community Services	Eugene Suk (Park Naturalist) ESuk@ci.monrovia.ca.us	119 West Palm Avenue Monrovia, California 91016	626.255.6799
	City of Sierra Madre Community Services Department		232 West Sierra Madre Boulevard Sierra Madre, California 91024	626.355.5278
General Contractor (Sediment Placement/Grading)	Quest Construction		1903 W Parkside Lane, Suite 100 Phoenix, Arizona 85027	623.505.7336
Mitigation Planning; Biological Surveys and Long-Term Performance Monitoring	Psomas (Restoration Ecologist)	Richard B. Lewis III, ENV SP Richard.Lewis@Psomas.com	225 South Lake Avenue, Suite 1000 Pasadena, California 91101	626.351.2000
Preparation of Irrigation Plans and Photo Simulations	Cornerstone Studios, Inc. (Landscape Architect)	Don Wilson, ASLA Don@CSStudios.com	106 West 4th Street, 5th Floor Santa Ana, California 92701	714.973.2200
Propagation of Native Plant Species	El Nativo Growers (Nursery)	Rebecca Nash RNash@ElNativoGrowers.com	200 South Peckham Road Azusa, California 91702	626.969.8449
Supplemental Botanical Surveys and Monitoring	Leatherman BioConsulting, Inc.	Sandy Leatherman SandyLeatherman@aol.com	4848 Lakeview Avenue, Suite 100E Yorba Linda, California 92886	714.701.0863
Mitigation Site Preparation, Installation, and Long-Term Maintenance	Nakae & Associates, Inc. (Restoration Contractor)	Kevin Kirchner OCStaff@Nakae.com	11159 Jeffrey Road Irvine, California 92602	949.786.0405
Collection/Propagation of Ferns, Rare Oaks, and Other Native Plant Species	California Botanic Garden (formerly Rancho Santa Ana Botanic Garden)	Naomi Fraga, PhD NFraga@RSABG.org	1500 North College Avenue Claremont, California 91711	909.625.8767
Native Seed and Cuttings Collection	S&S Seeds, Inc.	Jody Miller JodyMiller@ssseeds.com	6155 Carpinteria Avenue Carpinteria, California 93013	805.684.0436

A-2.0 PRELIMINARY MITIGATION TASKS

A-2.1 FINAL GRADING

Final grading of the Lower SPS included the placement of approximately 30 feet of sediment over the pre-existing condition. Public Works' Lower SPS grading plan included dual, spiraling drainage channels on the top of the fill to convey off-site inflows from the eastern slopes to a relocated outlet tower. The drainage design optimizes the retention and percolation of these inflows. Final grading was completed by Quest Construction (Public Works' General Contractor) in October 2012. The final/closure elevation of the Lower SPS deck area is approximately 650 feet above sea level. Site photographs are provided in Attachment B.

A-2.2 PROTECTION OF EXISTING RESOURCES

The Lower SPS is a permanent receptor site with drainage facilities subject to Public Works' ongoing inspection and maintenance to ensure the structural integrity of the SPS and to maintain proper storm water conveyance through the site. In addition to these operational issues, the resource protection measures described below were addressed, specific to the habitat creation program.

A-2.2.1 Biological Resources

Psomas (Public Works' Restoration Ecologist) installed flagging to indicate sensitive habitat areas and other resources (e.g., native vegetation along the eastern edge of the Lower SPS; pre-existing native tree/shrub seedlings in the planting area) to be protected during mitigation implementation, which started in September 2013.

A-2.2.2 Hazardous Materials

Nakae (Psomas' Restoration Contractor) ensured that no foreign material and/or liquid such as oil, gasoline, or other petroleum products was deposited on the mitigation site or in off-site staging areas. Best management practices were employed and included drip protection beneath vehicles and equipment as well as daily removal of all trash and debris (including micro-trash).

A-2.2.3 Fire Prevention/Safety

Due to the flammable native scrub vegetation in immediate off-site areas, Nakae incorporated fire prevention measures for all activities on site. Psomas installed combination locks on gates at multiple points of entry to the Santa Anita facility to facilitate emergency entry/egress as needed. Public Works' grading plan included a service road along the east edge of the deck planting area; this narrow alignment has been kept clear of ground-level vegetation to enable emergency vehicular access to the manufactured slope and other off-site areas (e.g., private residences, fuel modification zones) to the east of the site. The canopies of mature, planted oak trees will eventually extend above the narrow road.

A-2.2.4 Erosion Control

Nakae installed erosion-control measures in September 2013, including (1) fully biodegradable straw wattles on slope areas and (2) check dams (constructed of sandbags) in the spiraling drainages. Nakae also removed sediment from all concrete down-drains and V-ditches within and adjacent to the planting area to facilitate proper site drainage prior to mitigation implementation.

A-2.3 SOIL TESTING/TREATMENTS

The planting areas on the Lower SPS consist of placed fill materials. Prior to the placement of the final 30 feet of sediment, Public Works performed a compaction analysis in 2011. The analysis indicated that soil compaction on the pre-existing sediment pile ranged from 78 percent to 85 percent within the first 35 feet (below ground surface) and from 89 to 90 percent within the 35- to 53-foot range. Boring activities also indicated that ground water was located at approximately 50 feet below the ground surface (i.e., approximately 80 feet below the final deck elevation) (Public Works 2011). To improve habitat establishment conditions, the final 30 feet of sediment was placed with construction equipment but was not compacted beyond the placement efforts, resulting in a degree of compaction not exceeding 80 percent in the upper 30 feet of fill.

Following the final sediment placement, surface soil samples ('bucket samples') were obtained in three locations on the 8.0-acre planting site, including both deck (top of fill) and slope areas. As anticipated, the soil tests did not indicate any seriously problematic chemical or physical properties requiring the use of amendments to enable native plant growth on the mitigation site (Soil & Plant Laboratory, Inc. 2013). The OWHRMP specified that Public Works would carefully conserve a large volume of mulched native vegetation associated with the clearing of the Middle SPS. In September 2013, Nakae, under the direction of Psomas, incorporated this material (ripped via heavy machinery) into the Lower SPS deck area to a minimum depth of 2 feet to improve soil fertility. Urea was applied at a rate of 175 pounds per acre, concurrent with the mulch, to effect nitrogen balance/availability upon the beneficial decay of the organic material. The added soil organics factor in complex subterranean biotic processes.

The final soil surfaces were left uneven/roughened to improve plant and seed establishment conditions (e.g., to provide microhabitats for seedling germination/growth).

A-2.4 SUBSTRATE ENHANCEMENTS

Oak woodlands in Southern California, including OW mitigation/restoration sites, are typically deficient in coarse woody debris (CWD) (Tietje et al. 2002, 2005, 2015)—i.e., the vegetative debris that accumulates in mature woodlands upon the growth and decay of oaks and associated woody plant species. Specifically, "*downed wood is mostly lacking over at least half of the oak woodlands in California*", and, "*downed wood serves as a source of nutrients that can be released slowly back to the woodland during decomposition. It may also aid oak regeneration by providing physical protection for an emerging or growing sapling or seedling.*" (Tietje et al. 2005). Accordingly, the Restoration Ecologist identified the salvage and placement of coarse woody debris on the mitigation site as a high priority for program success, considering (1) the aggressive performance standards for planted/seeded native vegetation that were negotiated between Public Works and the CDFW, and especially (2) the required minimum percent cover and survival quantities of planted oaks.

Prior to Project initiation, the Restoration Ecologist flagged numerous native trees (coast live oak and western sycamore [*Platanus racemosa*]) and native shrubs on the Middle SPS for salvage and re-use as CWD on the Lower SPS mitigation site. Public Works directed Quest Construction to carefully remove these materials (i.e., native tree trunks, branches, brush piles), which were later stockpiled on the deck of the Lower SPS upon the completion of sediment placement tasks. As directed by Psomas, several of the native trees were removed with large, intact trunks (approximately 20 to 30 feet) attached to a large mass of root tissue (ballast) to be placed as natural 'snags' in excavated pits on the mitigation site. Psomas also flagged numerous large boulders and rock piles associated with the Project (i.e., coarse materials isolated from removed sediment) for placement on the Lower SPS mitigation site. Breakage and other boulder damage (e.g., spray painting) was avoided during collection and transport. Large-sized boulders were

preferentially used to create assemblages with larger internal/interstitial gaps to provide niches for a diversity of wildlife species.

Nakae, in coordination with Psomas, installed many tons of CWD and boulder materials in September and October 2013 using a variety of heavy equipment (e.g., excavators, bulldozers, grapples). These preliminary construction tasks included (1) installation of a total of 14 natural snags throughout the deck area in excavated pits up to one-third of their length that were stabilized via backfilling and machine recompaction, (2) placement of numerous large tree trunks (prone) and native brush piles, and (3) placement of numerous assemblages of boulders that were carefully arranged to provide internal gaps/niches for wildlife. Soil was 'heeled-up' against some of these features, especially on east and north aspects, to provide niches for the growth of specialty plants such as lance-leaved dudleya (*Dudleya lanceolata*). Many of the assemblages incorporate both CWD and rock materials, with smaller branches placed erect amid the boulders to provide perching opportunities for bird species, and buckets of oak twigs and leaf litter dumped into rock crevices for the benefit of detritivores (e.g., native termites) in the pile interiors.

Moreover, these materials were placed in a naturalistic manner to mimic a primeval, streamside woodland. The goal of including such substrate enhancements is to immediately provide habitat features (e.g., fallen logs, brush piles, snags) and associated wildlife functions/values (including beneficial decay processes) that would not otherwise exist on an OW habitat creation site for many years (i.e., until planted trees have grown, senesced, died, and begun to disarticulate).

With regard to plant pathogen dispersal risks associated with the movement of these biotic materials: It is important to note that (1) the habitat creation site (Lower SPS) occurs at the southern tip of a wedge of open space that extends from Angeles National Forest and other open space areas (in the north) into the urban grid of the San Gabriel Valley in the south, and (2) the CWD salvage site was the Middle SPS that is located immediately adjacent to (north of) the Lower SPS. Therefore, if plant pathogens had been moved from the Middle SPS to the Lower SPS, there would be no heightened risk of plant pathogen dispersal into natural areas (to the north), as the organisms would have to traverse the site of their origin (i.e., the Middle SPS).

A-2.5 HABITAT FENCING AND SIGNAGE

As described in the OWHRMP, a temporary, 8-foot-high fence (exclosure) was constructed at the perimeter of the deck portion of the 5.5-acre OW mitigation site to exclude large mammals, thereby reducing herbivory and trampling damage during the initial oak establishment phase. The fence was constructed using wood posts and smooth, horizontal wire (no barbed wire). The horizontal wires were spaced 6 inches apart in the lower 5-foot portion of the fence to enable smaller mammals to enter the planting area. A total of four locking gates were installed in the fence to provide access for maintenance and monitoring. Ongoing site maintenance includes Nakae, in coordination with Psomas, performing occasional modifications of the fencing to maintain wildlife exclusion (and wildlife safety). Two 'drinker' tanks were installed near the northeast corner of the mitigation site (outside the exclosure) to provide alternative water resources for wildlife excluded from the 5.5-acre deck area by the fencing.

Psomas designed and Nakae fabricated/installed a total of 12 interpretive signs around the mitigation site to explain the goals of the OWHRMP. The signage describes the native habitats being created on the site, engages readers' assistance in avoiding site damage and reporting concerns to the authorities, and cites the penalties for trespassing under municipal ordinances.

A-2.6 IRRIGATION SYSTEM INSTALLATION

Cornerstone Studios, Inc. (Psomas' subcontracting Landscape Architect) designed and Nakae installed a temporary irrigation system on the 8.0-acre mitigation site in 2013, which includes overhead spray components (site-wide) and a separately valved system of individual bubblers at each oak planting location. Irrigation system installation included the construction of a new water meter by the City of Arcadia Public Works Services Department (PWSD) near the intersection of Highland Oaks Drive and East Woodland Avenue. Nakae installed a new gate valve in the same box as the PWSD meter, and a new backflow preventer device (caged) was installed in the same general location. Water is delivered to the Lower SPS via a 4-inch mainline that extends north from the point of connection along the alignment of the Santa Anita Channel.

A-2.7 INTERIM WEED ABATEMENT

Interim weed abatement was performed on the mitigation site between the completion of sediment placement in 2012 and mitigation implementation in September 2013. Interim weed-abatement tasks included the hand-pulling of weed species prior to seed dispersal to reduce future weed occurrence in the planting areas. Nakae also removed/treated weeds during the performance of preliminary mitigation tasks. Only glyphosate-based herbicides that are approved by the U.S. Environmental Protection Agency (USEPA) for use in aquatic habitat areas (e.g., Roundup Custom®) were used on the mitigation site through 2019 when all herbicide use was suspended by Public Works. As described below, voluntary weed-abatement buffer areas (surrounding the habitat creation area) were also established at the time of mitigation installation.

A-2.8 WEED ABATEMENT BUFFER AREAS

Voluntary weed-abatement buffer areas (Buffer Areas) were established around the perimeter of the 8.0-acre mitigation site by Nakae and Psomas to avoid the proliferation of weeds in adjacent areas to reduce the contamination of the mitigation site by weed seeds (Exhibit 3). Buffer Area 1 (0.78 acre) extends up the slope to the eastern property boundary, and Buffer Area 2 (2.32 acres) includes the slopes (1 level) south and west of the mitigation site. Additional Buffer Areas (3a [1.72 acres], 3b [0.45 acre], and 4 [1.74 acres]) were established in July 2016 (Year Two) to further protect the mitigation site from weed contamination. Buffer Area 5 (0.37 acres) was implemented in 2018. A number of invasive/non-native, ornamental tree species such as Shamel ash (*Fraxinus uhdei*) were removed from Buffer Areas 3a and 4 (outside the nesting bird season). Some of the ornamental trees were treated via the slash/paint (herbicide) method to retain the snags for wildlife value. A total of 7.38 acres of adjacent land are now under voluntary weed control to benefit mitigation site performance.

Protective wire cages were installed around approximately 50 volunteer coast live oak seedlings in Buffer Area 2 to reduce deer herbivory impacts, which were observed to be severe at that time. Since mitigation implementation in 2013, several of these oaks have exhibited good growth due to the protective caging. In addition, as the result of ongoing weed control, numerous native volunteer shrub and herbs arose in Buffer Areas 1 and 2, such that the Buffer Areas provide valuable ancillary habitat for wildlife present on the mitigation site.

More than 20 mature, non-native Mexican fan palms (*Washingtonia robusta*) and other invasive perennial plant species were voluntarily removed by Public Works from an off-site manufactured slope (not part of Buffer Areas) to the east of the mitigation site. These plants were removed to improve mitigation site performance by eliminating a significant source of off-site weed seeds. Public Works secured rights-of-entry from several private landowners; and Nakae, in coordination with Psomas, removed this exotic vegetation in 2014.

A portion of Buffer Area 2 (0.18 acre) was re-designated to be part of the oak woodland mitigation site during the annual quantitative survey in spring 2019. The 0.18-acre area includes several volunteer oak plants as described in Section 3.3.

A summary of weed abatement activities in buffers and adjacent areas (on site and off site) is provided in Table A-3.

TABLE A-3
BUFFER/ADJACENT WEED ABATEMENT AREAS

Buffer Area No.	Area (Acres)	Dates		Description
		Start	End	
1	0.78	September 2013	Ongoing	Removal of all annual/perennial weeds.
2	2.32	September 2013	Ongoing	
3a	1.72	July 2016	Ongoing	Removal of non-native trees (some pine trees [*Pinus* sp.] retained). Removal of annual/perennial weeds.
3b	0.45	July 2016	Ongoing	
4	1.74	July 2016	Twice per year	Removal of all annual/perennial weeds.
5	0.37	September 2018	Twice per year	Removal of all annual/perennial weeds.
Total	**7.38**			
East Slope (Off Site)		October 2014	October 2014	One-time removal of invasive fan palms and other non-native/perennial plant species.

A-3.0 NATIVE PLANT MATERIALS

The OWHRMP specifies that all mitigation plant materials (i.e., seeds, cuttings, container plants) shall be of local origin (i.e., from the Santa Anita Wash/Rio Hondo Subwatershed). Seed production for a range of plant species varies from year to year; in addition, prior to January/February 2017, the mitigation program was being implemented in a period of extended, marked drought, which had suppressed the growth, flowering, and fruit/seed production for many plant species. Therefore, in order to obtain seed materials of adequate quantity and diversity, S&S started local seed collection tasks in June 2011 (2.5 years prior to mitigation installation) in coordination with Psomas. Seed collection in 2011 was limited to the Public Works' Santa Anita property; however, Public Works subsequently secured access to off-site open space areas in the cities of Arcadia, Monrovia, and Sierra Madre for more extensive, ongoing seed collection. Psomas and S&S have coordinated extensively with City of Monrovia park rangers on seed collection for several key plant species within the City's approximate 1,400-acre Hillside Wilderness Preserve.

Container plants of numerous species have been propagated to date by ENG and CalBG. S&S and/or Psomas also collected root/stem cuttings of local native plant species for the propagation of container plants (e.g., California fuchsia and puckered hedgenettle [*Stachys bullata*]) or for immediate translocation/planting on the mitigation site (e.g., basket rush [*Juncus textilis*] and California blackberry [*Rubus ursinu*s]).

As of November 2021, a total of 118 native plant species (seed and/or cuttings) were collected in the local subwatershed; this represents a diversity of installed plant species that is approximately four times greater than the diversity of the conceptual plant/seed palettes (31 plant species) that were listed in the OWHRMP. Most of these seeds/cuttings are being collected on an opportunistic basis during the extensive scouting activities that are performed in the subwatershed. In some cases, only trace amounts of seed have been collected (e.g., < 0.01 pound of torn catchfly [*Silene laciniata*]) due to scarce plant occurrences and/or drought-related low seed productivity in the region. The amounts of harvested seed are limited to avoid over-collection that would impact source plant regeneration (as noted for the ferns and rare oak species described below). It is important to establish these locally scarce plants on the habitat creation site—even in trace quantities—for the unique ecosystem services these species provide. Seed was collected from as many individual plants (and individual plant populations) as practicable for each species to optimize genetic diversity. The container plants, cuttings, and seed species and quantities installed to date on the mitigation site are summarized in Tables A-4 through A-6.

TABLE A-4
INSTALLED CONTAINER PLANTS AND CUTTINGS
(JANUARY 2014 – DECEMBER 2021)

Container Plants and Cuttings Species		Container Plants and Cuttings Quantities							
				Supplemental					
Scientific Name	Common Name	Phase I (Jan/Feb 2014)	Phase II (Dec 2014)	2015/2016	2017	2018	2019	2021	Total
Acmispon glaber var. *glaber*	glabrous deerweed	400	0	0	0	0	0	0	**400**
Acourtia microcephala (cuttings)	small-headed acourtia	0	10	0	0	0	0	0	**10**
Artemisia californica	California sagebrush	1,050	0	0	0	0	0	0	**1,050**
Artemisia douglasiana (cuttings)	mugwort	10	0	0	0	0	0	0	**10**
Artemisia douglasiana	mugwort	0	100	0	0	0	0	0	**100**
Asclepias eriocarpa (cuttings)	kotolo	0	10	0	0	0	0	0	**10**
Aspidotis californica	California lace fern	0	0	6	0	0	0	0	**6**
Ceanothus leucodermis	chaparral whitethorn	0	75	0	0	0	0	0	**75**
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain-mahogany	0	50	0	0	0	0	0	**50**
Clematis lasiantha	chaparral clematis	0	200	0	0	0	0	0	**200**
Dryopteris arguta	sharp-toothed wood fern	0	5	24	12	0	0	0	**41**
Dudleya lanceolata	lance-leaved dudleya	0	0	32	0	0	0	0	**32**
Elymus condensatus	giant wild-rye	0	80	0	0	0	0	0	**80**
Epilobium canum ssp. *canum*	California fuchsia	0	0	46	1	1	42	0	**90**
Eriodictyon crassifolium	thick-leaved yerba santa	0	0	5	0	0	0	0	**5**
Eriogonum fasciculatum var. *foliolosum*	leafy California buckwheat	750	0	0	0	0	0	0	**750**
Frangula californica ssp. *californica*	California coffee berry	0	100	0	0	0	0	0	**100**
Hesperoyucca whipplei	Whipple's chaparral yucca	150	100	0	0	0	0	0	**250**
Heteromeles arbutifolia	toyon	55	0	0	0	0	0	0	**55**
Juncus rugulosus	wrinkled rush	0	0	0	155	0	0	**10**	**165**
Juncus textilis (containers and cuttings)	basket rush	10	0	0	71	0	0	**10**	**91**
Keckiella cordifolia	heart-leaved bush penstemon	0	271	0	0	0	0	0	**271**
Lonicera subspicata var. *denudata*	naked partially-spiked honeysuckle	0	20	0	0	0	0	0	**20**
Malosma laurina	laurel sumac	40	0	0	0	0	0	0	**40**
Melica imperfecta	little California melica	150	125	0	0	0	0	0	**275**
Diplacus aurantiacus	orange bush monkeyflower	425	0	0	0	0	0	0	**425**
Opuntia vaseyi	Vasey's prickly-pear	200	100	0	0	0	0	76	**376**
Paeonia californica	California peony	0	0	0	8	0	0	0	**8**
Pellaea andromedifolia (cuttings)	coffee fern	5	0	0	0	0	0	0	**5**
Pellaea andromedifolia	coffee fern	0	20	128	11	0	15	**8**	**182**
Pellaea mucronata var. *mucronata*	bird's-foot fern	0	5	60	15	0	0	**2**	**82**
Penstemon heterophyllus var. *australis*[d]	southern bunch leaf beardtongue	0	0	0	0	5	7	0	**12**
Penstemon spectabilis var. *spectabilis*	spectacular beardtongue	75	5	0	0	0	0	0	**80**
Pentagramma triangularis[c]	goldback fern	0	0	0	2	0	0	0	**2**
Polypodium californicum	California polypody	0	20	91	71	65	25	0	**272**
Prunus ilicifolia ssp. *ilicifolia*	holly-leaved cherry	0	50	0	0	0	0	0	**50**
Pseudognaphalium californicum	California cudweed	460	0	0	0	0	0	0	**460**
Quercus agrifolia var. *agrifolia*[a]	coast live oak	358	0	0	0	0	0	0	**358**
Quercus agrifolia var. *agrifolia*[b]	coast live oak	0	24	0	0	0	0	0	**24**
Quercus engelmannii	Engelmann oak	0	57	0	0	0	0	0	**57**
Quercus durata var. *gabrielensis*	San Gabriel oak	0	25	0	0	0	0	0	**25**
Rhamnus ilicifolia	hollyleaf redberry	0	31	0	0	0	0	0	**31**
Rhus aromatica (cuttings)	skunk bush	10	0	0	0	0	0	0	**10**
Rhus ovata	sugar bush	55	0	0	0	0	0	0	**55**
Ribes aureum var. *gracillimum*	graceful golden currant	100	275	0	0	0	0	0	**375**
Ribes californicum	hillside gooseberry	0	0	29	2	65	25	0	**121**
Ribes malvaceum	leaf-shaped currant	0	0	0	0	0	5	0	**5**
Rosa californica	California rose	0	0	0	3	60	40	**20**	**123**
Rubus ursinus (cuttings)	California blackberry	10	0	0	0	0	0	0	**10**
Salvia apiana	white sage	250	150	0	0	0	0	0	**400**
Salvia mellifera	black sage	400	0	0	0	0	0	0	**400**
Sambucus nigra ssp. *caerulea*	blue elderberry	0	55	0	0	0	0	0	**55**
Selaginella bigelovii	Bigelow's spike-moss	0	10	0	0	0	0	0	**10**
Stachys bullata	puckered hedgenettle	0	0	135	0	0	0	0	**135**
Stipa lepida	foothill needle grass	0	0	641	218	17	0	0	**876**
Total (52 Native Container Plant/Cuttings Species)		**4,963**	**1,973**	**1,197**	**569**	**213**	**159**	**126**	**9,190**

[a] Initial oak planting locations established via direct sown acorns/seedlings.
[b] Supplemental planting of oaks in "T4" (deep 1-gallon) size.

TABLE A-5
SEED SPECIES COLLECTED/INSTALLED (JANUARY 2014 – FALL 2021)

Scientific Name	Common Name	Pounds Collected	Seed Quantities Installed (Collection Started in 2011)				Total Pounds Installed
			Sage Scrub Seed Mixes/Aspect		Hand-Seeding		
			South/West (2.0 acres)	North (0.54 acre)	Oak Woodland	Sage Scrub	
Initial/Conceptual OWHRMP Seed Species (11 Total) Collected by S&S Seeds in the Santa Anita Wash/Rio Hondo Subwatershed and Used for Initial Hydroseeding and Hand-Seeding in January 2014 and December 2014							
Acmispon glaber var. *glaber*	glabrous deerweed	43.82	12.00	2.00	8.00	2.40	**24.40**
Artemisia californica	California sagebrush	81.78	8.00	2.00	—	—	**10.00**
Camissoniopsis hirtella	pubescent camissoniopsis	0.20	—	0.10	0.05	0.05	**0.20**
Eriogonum fasciculatum var. *foliolosum*	leafy California buckwheat	81.95	20.00	5.00	—	—	**25.00**
Hesperoyucca whipplei	Whipple's chaparral yucca	42.34	1.00	—	—	2.00	**3.00**
Diplacus aurantiacus	orange bush monkeyflower	19.88	0.50	2.00	2.00	1.00	**5.50**
Phacelia cicutaria	cicuta-leaved phacelia	0.56	0.26	0.10	0.10	0.10	**0.56**
Pseudognaphalium californicum	California cudweed	5.54	1.00	1.00	2.00	1.34	**5.34**
Quercus agrifolia var. *agrifolia*	coast live oak	16.92	—	—	1.92	—	**1.92**
Salvia mellifera	black sage	13.14	1.00	1.00	1.00	—	**3.00**
Sambucus nigra ssp. *caerulea*	blue elderberry	6.07	—	—	1.00	0.50	**1.50**
Other Seed Species (27 Total) Collected to Date by S&S Seeds in the Santa Anita Wash/Rio Hondo Subwatershed (applied in 2014 and/or 2015)							
Acer macrophyllum	big-leaf maple	1.96	—	—	1.96	—	**1.96**
Artemisia douglasiana	mugwort	8.64	—	—	3.00	—	**3.00**
Ceanothus leucodermis	chaparral whitethorn	0.52	0.20	0.10	—	—	**0.30**
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain-mahogany	4.92	1.00	0.50	—	—	**1.50**
Chaenactis glabruiscula var. *glabruiscula*	yellow pincushion	0.92	0.25	0.10	0.10	0.47	**0.92**
Clarkia purpurea ssp. *quadrivulnera*	four-spot	0.20	0.05	0.05	0.05	0.05	**0.20**
Clematis lasiantha	chaparral clematis	4.30	0.80	0.20	1.00	0.25	**2.25**
Datura wrightii	Wright's jimsonweed	0.56	0.20	0.16	0.10	0.10	**0.56**
Eulobus californicus	California eulobus	0.82	—	—	0.41	0.41	**0.82**
Heteromeles arbutifolia	toyon	5.78	—	—	1.00	—	**1.00**
Lepidospartum squamatum	scaly scale-broom	14.56	—	—	1.00	—	**1.00**
Lupinus hirsutissimus	stinging lupine	11.90	—	—	9.90	2.00	**11.90**
Malacothrix saxatilis	rocky malacothrix	2.22	—	—	1.11	1.11	**2.22**
Oenothera elata ssp. *hirsutissima*	hairy tall evening primrose	0.04	—	—	0.04	—	**0.04**
Penstemon spectabilis var. *spectabilis*	spectacular beardtongue	5.52	—	—	2.00	3.52	**5.52**
Phacelia distans	distant phacelia	0.96	—	—	0.96	—	**0.96**
Phacelia minor	wild Canterbury bells	18.36	—	—	10.15	8.21	**18.36**
Phacelia ramosissima	branching phacelia	2.40	—	—	2.40	—	**2.40**
Prunus ilicifolia ssp. *ilicifolia*	holly-leaved cherry	9.20	—	—	4.00	—	**4.00**
Pseudognaphalium stramineum	straw-colored cudweed	3.20	1.00	0.20	1.00	1.00	**3.20**
Quercus agrifolia var. *agrifolia* (2015)	coast live oak	10.00	—	—	10.00	—	**10.00**
Rhamnus ilicifolia	hollyleaf redberry	2.64	—	—	1.89	0.50	**2.39**
Rhus ovata	sugar bush	7.35	—	—	1.00	—	**1.00**
Solanum douglasii	Douglas' nightshade	0.02	—	—	0.02	—	**0.02**
Stachys bullata	puckered hedgenettle	0.01	—	—	0.01	—	**0.01**
Stipa lepida	foothill needle grass	0.16	—	—	0.03	0.03	**0.06**
Umbellularia californica	California bay	4.44	—	—	3.00	—	**3.00**
Total (38 Native Seed Species)		**431.84**	**47.26**	**14.51**	**72.20**	**25.04**	**159.01**

TABLE A-5
SEED SPECIES COLLECTED/INSTALLED (JANUARY 2014 – FALL 2021)

Seed Species (73 Total) Collected to Date by Psomas in the Santa Anita Wash/Rio Hondo Subwatershed (Small Quantities, <1.0 Pound Collected per Species, Except as Noted) and Installed on the Mitigation Sites in 2014, 2015, 2016, and/or 2017		
Acer macrophyllum (big-leaf maple), *Acourtia microcephala* (small-headed acourtia), *Adenostoma fasciculatum* var. *fasciculatum* (chamise), *Alnus rhombifolia* (white alder), *Amorpha californica* (California false indigo), *Arctostaphylos glauca* (big berry manzanita), *Brickellia californica* (California brickellbush), *Brickellia nevinii* (Nevin's brickellbush), *Castilleja applegatei* (Applegate's paintbrush), *Ceanothus leucodermis* (chaparral whitethorn), *Ceanothus oliganthus* (few-flowered California-lilac), *Cercocarpus betuloides* var. *betuloides* (birch-leaf mountain-mahogany), *Cirsium occidentale* var. *californicum* (California thistle), *Clarkia dudleyana* (Dudley's clarkia), *Clematis lasiantha* (chaparral clematis), *Corethrogyne filaginifolia* (filago-leaved sand-aster), *Datura wrightii* (Wright's jimsonweed), *Delphinium cardinale* (cardinal larkspur), *Diplacus aurantiacus* (orange bush monkeyflower), *Dudleya lanceolata* (lance-leaved dudleya), *Elymus condensatus* (giant wild-rye), *Epilobium canum* ssp. *canum* (California fuchsia), *Ericameria parishii* var. *parishii* (Parish's goldenbush), *Erigeron foliosus* var. *foliosus* (leafy fleabane), *Eriodictyon crassifolium* (thick-leaved yerba santa), *Eriogonum elongatum* var. *elongatum* (long-stem wild buckwheat), *Eriophyllum confertiflorum* var. *confertiflorum* (golden-yarrow), *Erythranthe cardinalis* (scarlet monkeyflower), *Frangula californica* ssp. *californica* (California coffee berry), *Galium angustifolium* ssp. *angustifolium* (narrow-leaved bedstraw), *Hazardia squarrosa* var. *grindelioides* (grindelia-like saw-toothed goldenbush), *Hesperoyucca whipplei* (Whipple's chaparral yucca), *Heteromeles arbutifolia* (toyon), *Heterotheca grandiflora* (telegraph weed), *Holodiscus discolor* (oceanspray), *Juncus rugulosus* (wrinkled rush), *Juncus textilis* (basket rush), *Keckiella cordifolia* (heart-leaved bush penstemon), *Lathyrus vestitus* (covered sweet pea), *Lepidospartum squamatum* (scaly scale-broom), *Linanthus californicus* (prickly phlox), *Lonicera subspicata* var. *denudata* (naked partially-spiked honeysuckle), *Lupinus concinnus* (bajada lupine), *Lupinus longifolius* (long-leaved lupine), *Lupinus truncatus* (cut leaf lupine), *Malacothrix saxatilis* (rocky malacothrix), *Marah macrocarpa* (chilicothe), *Melica imperfecta* (little California melica), *Mentzelia laevicaulis* (smooth-stemmed blazing star), *Mirabilis laevis* var. *crassifolia* (wishbone bush), *Paeonia californica* (California peony), *Penstemon spectabilis* var. *spectabilis* (spectacular beardtongue), *Phacelia cicutaria* (cicuta-leaved phacelia), *Phacelia ramosissima* (branching phacelia), *Pseudognaphalium bioletti* (Bioletti's cudweed), *Pseudognaphalium californicum* (California cudweed), *Pseudognaphalium canescens* (hairy cudweed), bigcone Douglas-fir (*Pseudotsuga macrocarpa*), *Quercus agrifolia* var. *agrifolia* (coast live oak), *Quercus chrysolepis* (canyon live oak), San Gabriel oak (*Quercus durata* var. *gabrielensis*), *Quercus engelmannii* (Engelmann oak), *Rhus ovata* (sugar bush), *Ribes aureum* var. *gracillimum* (graceful golden currant), *Salvia apiana* (white sage), *Salvia mellifera* (black sage), *Senecio flaccidus* var. *douglasii* (Douglas' threadleaf ragwort), *Silene laciniata* (torn catchfly), *Solidago velutina* (velvety goldenrod), *Stephanomeria cichoriacea* (silver rock-lettuce), *Stipa coronata* (crested needle grass), *Symphoricarpos* cf. *mollis* (creeping snowberry), *Umbellularia californica* (California bay).		
Cuttings Species (24 Total) and Rare Oak Acorns (2 Species) Collected to Date by Psomas, California Botanic Garden, and S&S Seeds in the Santa Anita Wash/Rio Hondo Subwatershed		
Scientific Name	**Common Name**	**Notes**
Acourtia microcephala	small-headed acourtia	Direct planting on mitigation site.
Artemisia douglasiana	mugwort	Direct planting on mitigation site.
Asclepias eriocarpa	kotolo	For container plant propagation and direct planting on mitigation site.
Aspidotis californica	California lace fern	Rhizome cuttings for container plant propagation and direct planting on mitigation site.
Chlorogalum pomeridianum	afternoon soap plant	Direct planting on mitigation site.
Dryopteris arguta	sharp-toothed wood fern	Rhizome cuttings for container plant propagation (only).
Dudleya lanceolata	lance-leaved dudleya	For container plant propagation and direct planting on mitigation site.
Epilobium canum ssp. *canum*	California fuchsia	Container plant propagation (only).
Juncus rugulosus	wrinkled rush	Container plant propagation (only).
Juncus textilis	basket rush	Container plant propagation and direct planting on mitigation site.
Paeonia californica	California peony	Container plant propagation and direct planting on mitigation site.
Pellaea andromedifolia	coffee fern	Rhizome cuttings for container plant propagation and direct planting on mitigation site.
Pellaea mucronata var. *mucronata*	bird's-foot fern	Rhizome cuttings for container plant propagation (only).
Pentagramma triangularis	goldback fern	Container plant propagation (only).
Penstemon heterophyllus var. *australis*	southern bunch leaf beardtongue	Container plant propagation (only).
Polypodium californicum	California polypody	Rhizome cuttings for container plant propagation (only).
Quercus durata var. *gabrielensis*	San Gabriel oak	Container plant propagation (only)
Quercus engelmannii	Engelmann oak	Container plant propagation and direct planting (acorns) on mitigation site.
Rhamnus crocea	spiny redberry	Container plant propagation (only).
Rhus aromatica	skunk bush	Direct planting on mitigation site.
Ribes californicum	hillside gooseberry	Container plant propagation (only).
Ribes malvaceum	leaf-shaped currant	Container plant propagation (only).
Rosa californica	California rose	Container plant propagation (only).
Rubus ursinus	California blackberry	Direct planting on mitigation site.
Selaginella bigelovii	Bigelow's spike-moss	Direct planting on mitigation site.
Stachys bullata	puckered hedgenettle	For container plant propagation and direct planting on mitigation site.
OWHRMP: Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project; S&S: S&S Seeds.		

TABLE A-6
SUPPLEMENTAL SEED SPECIES (2015 – 2021)

Plant Species[a]		Quantity (Pounds)					
Botanical Name	**Common Name**	**Dec. 2015**	**Dec. 2016**	**Jan./Nov. 2018**	**Nov. 2019**	**Nov. 2020**	**Dec. 2021**
Acer macrophyllum	big-leaf maple	0.10	–	–	–	–	–
Acmispon maritimus var. *maritumus*	coastal deervetch	–	–	–	–	–	1.04
Ambrosia psilostachya	western ragweed	–	–	–	–	–	3.00
Artemisia douglasiana	mugwort	–	–	–	–	–	2.62
Brickellia nevinii	Nevin's brickellbush	–	–	–	–	–	2.00
Castilleja applegatei[b]	Applegate's paintbrush	trace	trace	–	–	–	–
Clarkia bottae	punchbowl godetia	–	–	–	–	–	0.02
Clarkia dudleyana[b]	Dudleya's clarkia	trace	–	–	–	–	–
Clematis lasiantha	chaparral clematis	0.25	–	–	–	–	–
Corethrogyne filaginifolia	filago-leaved sand-aster	–	–	–	–	–	1.28
Cryptantha intermedia var. *intermedia*	intermediate cryptantha	–	–	–	–	–	2.20
Delphinium cardinale[b]	cardinal larkspur	trace	–	–	–	–	–
Diplacus aurantiacus	orange bush monkeyflower	–	–	–	–	–	0.94
Dudleya lanceolata[b]	lance-leaved dudleya	trace	–	–	–	–	–
Epilobium canum ssp. *canum*[b]	California fuchsia	trace	–	–	–	–	–
Erigeron foliosus var. *foliosus*[b]	leafy fleabane	trace	trace	–	–	–	–
Eriogonum elongatum var. *elongatum*	long-stem wild buckwheat	–	–	–	–	–	1.10
Eriophyllum confertiflorum var. *confertiflorum*[b]	golden-yarrow	trace	trace	–	–	–	–
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	chrysamthemum-leaved eucrypta	–	–	–	–	–	2.86
Eulobus californicus	California eulobus	0.82	–	–	–	–	–
Erythranthe cardinalis	scarlet monkeyflower	–	trace	–	–	–	
Frangula californica ssp. *californica*	California coffee berry	–	–	–	–	–	1.16
Hazardia squarrosa var. *grindelioides*	grindelia-like saw-toothed goldenbush	trace	–	–	–	–	2.26
Hesperoyucca whipplei	chaparral yucca	–	–	–	–	–	3.30
Holodiscus discolor	oceanspray	trace	trace	–	–	–	–
Lathyrus vestitus[b]	covered sweet pea	trace	–	–	–	–	–
Lonicera subspicata var. *denudata*	naked partially-spiked honeysuckle	trace	0.05	–	–	–	–
Lupinus concinnus	bajada lupine	trace	–	–	–	–	–
Lupinus hirsutissimus	stinging lupine	3.41	–	–	–	–	1.92
Lupinus longifolius	long-leaved lupine	trace	–	–	–	–	–
Lupinus truncatus	cut leaf lupine	trace	–	–	–	–	0.94
Malacothrix saxatilis	rocky malacothrix	2.22	–	–	–	–	2.10

TABLE A-6
SUPPLEMENTAL SEED SPECIES (2015 – 2021)

Plant Species[a]		Quantity (Pounds)					
Botanical Name	**Common Name**	**Dec. 2015**	**Dec. 2016**	**Jan./Nov. 2018**	**Nov. 2019**	**Nov. 2020**	**Dec. 2021**
Marah macrocarpa	chilicothe	trace	–	–	–	–	–
Mentzelia laevicaulis	smooth-stemmed blazing star	trace	–	–	–	–	–
Mentzelia micrantha	small-flowered blazing star	–	–	–	–	–	0.88
Mirabilis laevis var. crassifolia	wishbone bush	–	–	–	–	–	0.26
Penstemon spectabilis var. *spectabilis*	spectacular beardtongue	5.52	4.00	3.00	–	–	–
Phacelia grandiflora	large-flowered phacelia	–	–	–	–	–	2.96
Phacelia minor	wild Canterbury bells	12.21	–	–	–	–	1.96
Pseudognaphalium biolettii	Bioletti's cudweed	–	–	–	–	–	0.12
Rhamnus crocea	spiny redberry	–	0.05	–	–	–	–
Rhamnus ilicifolia	hollyleaf redberry	–	0.05	–	–	–	–
Quercus agrifolia var. *agrifolia* (acorns)	coast live oak	10.00	–	1.00	–	2.00	4.00
Quercus chrysolepis (acorns)	canyon live oak	1.00	–	–	–	–	–
Quercus durata var. *gabrielensis* (acorns)	San Gabriel oak	0.10	–	–	–	–	–
Quercus engelmannii (acorns)	Engelmann oak	5.00	–	5.00	2.00	–	4.00
Salvia columbariae	chia	–	–	–	–	–	0.66
Senecio flaccidus ssp. *douglasii*	Douglas' threadleaf ragwort	–	–	–	–	–	3.10
Silene laciniata[b]	torn catchfly	trace	trace	–	–	–	–
Solidago velutina	velvety goldenrod	trace	–	–	–	–	–
Stephanomeria cichoriacea[b]	silver rock-lettuce	trace	trace	–	–	–	–
Stipa lepida	foothill needle grass	0.06	–	–	–	–	–
Total		**40.69**	**4.15**	**9.00**	**2.00**	**2.00**	**46.68**

Trace: < 0.05 pounds of seed.

[a] All seed species were collected in the Santa Anita Wash/Rio Hondo Sub-Watershed.

[b] These herbaceous seed species (mixed) were carefully scratched into soil along the north and east edges of numerous boulder and woody debris assemblages in fall 2015 and 2016 (as listed).

A-3.1 OAK SPECIES

Acorns of four species of native oaks—coast live oak, canyon live oak (*Quercus chrysolepis*), San Gabriel oak (*Quercus durata* var. *gabrielensis*), and Engelmann oak—were collected in the local subwatershed. Coast live oak acorns were collected from a minimum of 50 individual trees to adequately incorporate the genetic diversity of the local tree population in the created woodland habitat. San Gabriel oak and Engelmann oak are rare plant species (i.e., both have a California Rare Plant Rank [CRPR] of 4.2, 'Plants of limited distribution – a watch list'); therefore, acorns of these species were judiciously collected by CalBG and the Restoration Ecologist to avoid over-collection from the source plants. Some Engelmann oak acorns were also obtained from public rights-of-way in developed areas in the local subwatershed (i.e., from roadway gutters) when observed beneath massive 'heritage' trees of this species (i.e., specimens assumed to be naturally occurring). Canyon live oak acorns were obtained from trees found at relatively low elevations in the subwatershed. Oak acorns were collected and stored for direct seeding on the site and were also propagated as container plants (seedlings [in 'liners'] and 'T4' [deep 1-gallon] sizes). A substantial volume of natural oak leaf litter (e.g., leaves, twigs, acorns/caps) was carefully conserved and separately stockpiled during relocation of the salvaged CWD to be applied as a preferred mulch to the numerous oak planting locations on the mitigation site.

A-3.2 SHRUBS/SUBSHRUBS

A large variety of shrub/subshrub propagules were collected in the subwatershed, including species adapted to grow in moist/shady woodland understory conditions (i.e., hillside gooseberry [*Ribes californicum*]) and species adapted to survive in hot/dry, south-facing or west-facing slope conditions (e.g., white sage [*Salvia apiana*]). Large, evergreen shrub species such as laurel sumac (*Malosma laurina*) and sugar bush (*Rhus ovata*) were propagated in limited numbers and excluded from the applied seed mixes to avoid excessive cover of these species on the mitigation site (i.e., to avoid the creation of chaparral habitat [rather than OW or CSS], which would be contrary to program goals). Vining subshrubs such as chaparral clematis (*Clematis lasiantha*) and heart-leaved bush penstemon (*Keckiella cordifolia*) were propagated for planting in association with large shrubs (or CWD) into which they can beneficially clamber.

A-3.3 CACTUS AND YUCCA

S&S, in coordination with Psomas, collected a total of 300 cuttings (pads) of Vasey's prickly-pear (*Opuntia vaseyi*) from the Middle SPS in June 2013 and 200 cuttings in March 2018. The cactus pads were selected from a minimum of ten separate cactus patches (in 2013 and again in 2018) and were delivered to ENG for propagation (2013 only). No more than ten pads were collected from any individual plant to avoid adversely impacting the plants' overall structure and value for wildlife. The cactus pads that were collected and planted in 2018 were installed in Buffer Areas 2 and 3a (not within the 8.0-acre mitigation site). A total of 76 locally-harvested Vasey's prickly-pear cactus pads were also planted in Buffer Area 1 (eastern slope) in November 2021 as described in Section 2.0 of the foregoing seventh annual monitoring report. Container plants and seeds of Whipple's chaparral yucca (*Hesperoyucca whipplei*), a fibrous shrub, were installed with the cactus in designated patches of spiniferous vegetation—exclusive of woody shrub species—to diversify the mosaic of subhabitats to be created on the mitigation site.

A-3.4 ANNUAL/PERENNIAL HERBS

A great variety of native grass and herb propagules were also collected in the subwatershed. Upland woodland and scrub habitat creation/restoration sites are often deficient in native herbaceous (non-woody) species cover and/or diversity. The herbaceous component (e.g., wildflowers, grasses) of California OW habitats has been altered (Rissman et al. 2008) as the

result of various anthropogenic impacts such as physical disturbance (grading), grazing, altered fire regimes, altered soil hydrology, agricultural land uses, and the deliberate or accidental introduction of invasive plant species. As with woody plants, each herbaceous plant species (e.g., California eulobus [*Eulobus californicus*] and little California melica [*Melica imperfecta*]) supports a unique suite of arthropods (e.g., bees, beetles, butterflies) that use these plants for nectar (with important pollination effects); feed on the plants' leaves/roots/stems (various life stages, including larvae); or prey upon other associated fauna. Each of these smaller organisms makes a unique contribution to a complex food web in a natural habitat. Portions of the OW and CSS planting areas have been designated for herbaceous vegetation only (i.e., shrub species were excluded); these native grass/herb meadows are expected to support an increasing diversity of arthropods. The seeds of several native herb species that prefer mesic/shaded niches were combined into a specialized, supplemental seed mix (a total of 60 packets) that was scratched into crevices on the north and east aspects of the CWD and boulder assemblages in fall 2015.

A-3.5 FERN SPECIES

CalBG, in coordination with the Restoration Ecologist, collected rhizomes (roots) from six species of native ferns (e.g., coffee fern [*Pellaea andromedifolia*]) in the local subwatershed, starting in 2013. The rhizomes were collected from multiple, geographically separated populations of ferns of each species to optimize the genetic diversity of the collection. CalBG propagated the collected rhizomes into 5-gallon 'stock plants' (for long-term nursery culture), from which several hundred smaller plants are being derived for planting on the mitigation site. By the use of multiple collection sites and by the culture of stock plants, hundreds of nursery plants with varied genetics are being created with minimized impact on wild plant populations. It would not normally be feasible to include ferns in a revegetation palette for a barren/exposed planting area such as the Lower SPS; however, due to the ample substrate enhancements provided for this program (CWD, boulder assemblages), sheltered niches were immediately available for targeted installation of ferns and other plants with particular light/moisture preferences (e.g., Dudley's clarkia [*Clarkia dudleyana*], a native wildflower) as observed in nearby habitats in the San Gabriel Mountain foothills. Nearly 600 propagated fern plants (multiple species) of local genetic origin have been installed on the mitigation site.

A-3.6 RIPARIAN SPECIES

The spiraling drainages on the site convey both storm flows and nuisance flows (e.g., irrigation of fuel modification zones), from the adjacent slopes and residences. A variety of volunteer riparian plant species (e.g., lovegrass flatsedge [*Cyperus eragrostis*], fringed willowherb [*Epilobium ciliatum* ssp. *ciliatum*]) became established in the drainages during the preliminary mitigation phase (2012–2013) and continued into the installation and long-term maintenance phases of the program. These volunteer riparian plant species were preserved on the site and were augmented via the collection and planting of other riparian plant species (e.g., wrinkled rush [*Juncus rugulosus*], hairy tall evening primrose [*Oenothera elata* ssp. *hirsutissima*]) via seed or cuttings. The 8.0-acre habitat creation site (and associated weed abatement buffer areas) exhibits a wide range of aspects, hydrologic conditions, and microtopographic features that provide opportunities for high botanical diversity.

A-4.0 MITIGATION INSTALLATION

Nakae performed mitigation site installation tasks (planting and seeding) in two phases, as summarized below. Mitigation installation was completed in late December 2014, and the long-term maintenance period started on January 1, 2015.

- **Phase 1 Installation (January/February 2014)**
  - 4,963 container plants and cuttings (21 species)
  - 135 pounds of native seed (hydroseeded and/or hand-seeded)
- **Phase 2 Installation (December 2014)**
  - 1,973 container plants and cuttings (27 species)
  - 25 pounds of native seed (hand-seeded only)

A-4.1 CONTAINER PLANTING (2014)

A-4.1.1 Oak Species

A total of 464 oaks (*Quercus* spp.) were installed via container planting on the 5.5-acre oak woodland mitigation site. Native oaks were also established via direct-seeding of acorns (multiple oak species). Oaks that are established via the direct seeding of acorns develop deep taproots that allow better access to soil moisture for the developing seedlings (McCreary and McPherson 2005; Young and Evans 2005) than container-planted oaks. The oak planting locations were staked by the Restoration Ecologist. The majority of the selected planting sites (411 caged locations) occur along an east or north aspect immediately adjacent to CWD/boulder assemblages in order to provide (1) protection from hot afternoon sun, (2) some protection from drying winds, and (3) access to persistent soil moisture (beneath the assemblages) for the developing oak roots. Nakae used a machine auger (Dingo™) to create the oak planting holes, which were pre-watered prior to planting/seeding. A minimum of ten acorns were installed in each coast live oak planting location, along with one small coast live oak seedling. Mycorrhizal inoculum (AM-120™) was included in the backfilled soil at each location, along with one unit of fertilizer (Bio Pak 16-6-8™). The acorns were planted within the top 1 inch of soil, then covered with 1 to 2 inches of salvaged oak leaf litter. Protective caging (above ground only) was installed around each oak planting site, as follows: (1) 6-foot-high by 20-inch-wide chicken wire cylinders anchored with T-posts for planting sites within the 8-foot wildlife exclosure and (2) approximately 4-foot-high by 6-foot-wide caging (steel wire mesh) for oaks planted outside the exclosure. Shade cloth (70 percent) was wrapped around the tops and southwest aspect of each cage (180 degrees of coverage), for added protection from afternoon sun and herbivory by deer. All container plants were installed within 24 hours after delivery on the site to avoid plant decline during prolonged on-site storage.

A-4.1.2 Non-Oak Species

For both installation phases, Psomas marked the container planting locations using color-coded wire flags for each plant species. The planting area layouts roughly follow the conceptual planting plans provided in the OWHRMP (i.e., naturalistic/non-linear). Slope species were located according to their preferred aspects (e.g., orange bush monkeyflower [*Diplacus aurantiacus*] on north-facing versus south-/west-facing slopes). A number of polygons were flagged and planted with cactus and yucca (spiniferous shrubs) and/or herbaceous species only, as described above. All planting holes were pre-watered, and mycorrhizae and fertilizer packets were installed at each location, as described above. The overall goals of the planting design were to create a habitat

mosaic on the mitigation site and to take advantage of niche habitat opportunities for plant species with special requirements. Also, a number of California sagebrush plants (*Artemisia californica*, a relatively fast-growing shrub) were installed on the southwest aspect of some of the planted oaks to function as temporary 'nurse plants' to enhance wind protection and shading for the developing oak seedlings. The initial container shrub/subshrub planting density (Phases 1 and 2) was approximately 600 plants per acre on the combined CSS and OW mitigation sites.

A-4.2 SEED APPLICATION (2014)

Seed species were installed via hydroseeding and/or hand-broadcasting. The seeds of native grass species were installed only via hand-broadcasting. All seed mixes were stored in a dark, cool place and not allowed to become damp prior to application. All of the seed mix labels were retained by Nakae and provided to Psomas. A granular form of mycorrhizal inoculum (AM-120™) was added to the hydroseed mixes at a rate of 60 pounds per acre. An agriculturally suitable marking dye was also included in the hydroseed mix. Slope stabilization was provided by Flexterra™ Flexible Growth Medium, applied at a rate of 3,500 pounds per acre in the hydroseeding process. As described above, Psomas flagged a number of polygons on the CSS and OW sites for the establishment of spiniferous shrubs (cactus/yucca) or strictly herbaceous (non-woody) plant species via planting and/or seeding.

A-4.3 SUPPLEMENTAL PLANTING AND SEEDING (2015 THROUGH 2021)

Psomas coordinated/monitored the collection and propagation of supplemental seed and cutting materials with CalBG and S&S in 2015 and 2016, including field collections from open space areas in the cities of Monrovia and Sierra Madre (Public Works secured access to Sierra Madre open space areas for seed/plant collection in 2014). Supplemental planting and seeding occurred in December 2015, February 2016, January 2017, February 2018, February 2019, and December 2021. The 51 supplemental container plants and cuttings (5 species) installed in December 2021 included wrinkled rush (10 plants), basket rush (10 plants), coffee fern (8 plants), bird's-foot fern (*Pellaea mucronata* var. *mucronata*; 3 plants), and California rose (*Rosa californica*; 20 plants). The container plants installed in December 2021 were placed in particular niches where they could be established without irrigation (i.e., associated with boulders, CWD, or along drainages).

Supplemental seeding of oak acorns (32.1 pounds, total) occurred on the OW site in October 2015, January 2018, November 2018, November 2019, November 2020, and December 2021, to provide additional contingency plants to further assist in compliance with mitigation performance standards. Approximately 25 pounds of non-oak seeds (27 species) of primarily herbaceous plants (e.g., wild Canterbury bells [*Phacelia minor*] and rocky malacothrix [*Malacothrix saxatilis*]) were installed by hand (hand sown, then scratched in with metal rakes) on the OW and CSS mitigation sites in fall 2015 (1) to improve vegetative cover and diversity and (2) to further establish a rich seed bank of native herbaceous species in the topsoil. In the event of wildfire or other site disturbance, the recovery of damaged areas could be expedited through the expression of this native seed bank. A total of 60 packets of mixed, locally collected, herbaceous plant species (e.g., silver rock-lettuce [*Stephanomeria cichoriacea*]) were also prepared and installed among the numerous boulder and woody debris assemblages on the site in fall 2015. Several of the plant species from the packets have already germinated and bloomed in these niches, including Dudley's clarkia and cardinal larkspur (*Delphinium cardinale*). A total of 4.15 pounds of native seed (11 species—mostly herbs) was installed in fall 2016. A total of 6.0 pounds of seed of spectacular beardtongue (*Penstemon spectabilis* var. *spectabilis*) was sown on the mitigation site and in adjacent weed-control buffer areas in fall 2016 and fall 2018 (combined). As noted in Section 2.0 and Table 1, a total of 46.68 pounds (25 species) of supplemental seed of local genetic origin was applied to the OW and CSS mitigation sites in December 2021.

A-5.0 MITIGATION PERFORMANCE STANDARDS

Project mitigation performance standards were prepared in coordination with the CDFW and incorporate the terms and conditions of Environmental Impact Report (EIR) mitigation measures BIO-D/BIO-E and the CDFW SAA. A summary of mitigation performance standards is provided in Tables A-7 and A-8.

TABLE A-7
OAK WOODLAND PERFORMANCE STANDARDS

Year	Native Percent Cover (Minimum)							Non-Native Percent Cover[f]	Native Vegetation Diversity[g]	Oak Tree Survival (Percent)[h]
	Trees[a]	Shrubs[a]			Spiniferous[e]	Herbs[a]	Total[f]			
		Large[b]	Medium[c]	Subshrubs[d]						
1							**25.0**	< 5		80
2							**40.0**	< 5		80
3	0.5	3.0	14.0	3.0	0.5	25.0	**55.0**	< 5	15	80
4							**65.0**	< 5		80
5	1.0	4.0	16.0	4.0	1.0	30.0	**75.0**	< 5	18	80
6							**75.0**	< 5		80
7	1.5	5.0	18.0	5.0	2.0	30.0	**75.0**	< 5	20	80
8							**75.0**	< 5		80
9							**75.0**	< 5		80
10	2.0	5.0	18.0	5.0	2.0	30.0	**75.0**	< 5	24	80

[a] Absolute Cover
[b] Large evergreen shrubs such as toyon (*Heteromeles arbutifolia*).
[c] Includes medium shrubs (evergreen or deciduous) such as graceful golden currant (*Ribes aureum* ssp. *gracillimum*).
[d] Includes subshrubs and vining shrubs (evergreen or deciduous) such as California blackberry (*Rubus ursinus*).
[e] Category described as 'succulents' in the *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal* Project (BonTerra Psomas 2014).
[f] Class Cover
[g] Number of Species. Statistical diversity (Shannon Diversity Index) will also be compared to the measured values on the reference site in 2013.
[h] Relative to the initial planting quantities specified in the OWHRMP.

TABLE A-8
COASTAL SAGE SCRUB PERFORMANCE STANDARDS

Year	Native Percent Cover (Minimum)						Non-Native Percent Cover[f]	Native Vegetation Diversity[g]
	Shrubs[a]							
	Large[b]	Medium[c]	Subshrubs[d]	Spiniferous[e]	Herbs[a]	Total[f]		
1						**25.0**	< 5	
2						**40.0**	< 5	
3	2.0	24.0	2.0	0.5	8.0	**55.0**	< 5	10
4						**65.0**	< 5	
5	3.0	28.0	3.0	1.0	10.0	**75.0**	< 5	12
6						**75.0**	< 5	
7	4.0	35.0	4.0	2.0	15.0	**75.0**	< 5	15
8						**75.0**	< 5	
9						**75.0**	< 5	
10	5.0	50.0	5.0	2.0	15.0	**75.0**	< 5	18

[a] Absolute Cover
[b] Large evergreen shrubs such as sugar bush (*Rhus ovata*).
[c] Includes medium shrubs (evergreen or deciduous) such as leafy California buckwheat (*Eriogonum fasciculatum* var. *foliolosum*).
[d] Includes subshrubs and vining shrubs (evergreen or deciduous) such as chaparral virgin's bower (*Clematis lasiantha*).
[e] Category described as 'succulents' in the *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal* Project (BonTerra Psomas 2014).
[f] Class Cover
[g] Number of Species. Statistical diversity (Shannon Diversity Index) will also be compared to the measured values on the reference site in 2013.

A-6.0 OAK TREE SURVIVAL AND GROWTH

As noted in Table A-7, the performance standard for survival of planted oaks is 80 percent, relative to the initial planting quantity of oaks specified in the OWHRMP. Therefore, the survival standard for coast live oaks is 287 trees (initial quantity per OWHRMP: 358 trees) and the survival standard for Engelmann oaks is 4 trees (initial quantity per OWHRMP: 5 trees). A greater quantity and diversity of oak species has been planted on the mitigation site to date than was specified in the OWHRMP, including a total of 411 caged planting locations and numerous additional planted and volunteer oak seedlings.

A minimum 2-percent canopy cover for oak tree species is required at the end of the seven-year to ten-year maintenance period. The planted oaks must be self-sufficient for a period of two years without supplemental irrigation to be eligible for sign-off.

As described in the OWHRMP, the oak trees installed on the mitigation site are regularly assessed by a qualified Arborist. Criteria for assessing tree health include visual evidence of vigor, such as the amount of foliage; leaf color and size; presence and length of new shoot growth; presence of branch or twig dieback; severity of insect infestation; the presence of disease, heart rot, fire damage, or mechanical damage; the amount of new growth; the appearance of bark; and the presence of and rate of callous development over wounds. Structural integrity will also be evaluated with respect to branch attachment, branch placement, presence of decay, presence of exposed roots due to soil erosion, and stability. The health of each tree will be recorded on a scale of 1 to 5 based on the criteria presented in Table A-9.

TABLE A-9
OAK TREE HEALTH RATING CRITERIA

Rating	Criteria
5	Tree in excellent health with abundant foliage, new leaf growth, and shoot elongation; no signs of herbivory, insect infestation, disease, fungus growth, or limb/trunk damage.
4	Tree in very good health with ample green foliage and new leaf growth; minor signs of drought stress, herbivory, insect infestation, decreased shoot growth, or loss of vigor.
3	Tree in moderate health with limited or uneven new leaf growth; moderate signs of drought stress; noticeable insect activity; decay on branches; noticeable herbivory damage.
2	Tree in poor health with existing leaves yellowing; limited/stunted new leaf growth; decreased shoot growth from previous year; dark-colored cracks or abnormalities on trunk; presence of fungus; observable decay on trunk or major limbs; sap bleeding from trunk; significant insect infestation; extensive herbivory; thinning canopy.
1	Tree in obvious decline with existing leaves yellowing and no new leaf growth; extensive limb or trunk damage; large cracks or other decay on trunk; bleeding sap; dieback of more than 30% of the canopy; a general lack of vigor.

A-6.1 VEGETATION COVER AND DIVERSITY

As detailed in Tables A-7 and A-8, the OWHRMP includes performance standards for both vegetation cover (i.e., the percent of the mitigation site that is covered by various classes of plant species [e.g., large shrubs]) and vegetation diversity—i.e., plant species richness (number of species present) and diversity (statistical). Vegetation cover performance is assessed on an annual basis via the performance of vegetation transects (point intercept) and quadrats, as described below. The vegetation cover standards reflect the goal of creating a mosaic of habitat areas with substantial structural diversity. Based on these sampling methods, the various vegetation cover and diversity metrics that are used are outlined in Table A-10.

TABLE A-10
VEGETATION COVER AND DIVERSITY METRICS

Metric	Equation	Variables
Density of Species 'i' (D_i)	$D_i = n_i / A$	n_i = total individuals of species 'i'
		A = total area sampled
Relative Density for Species 'i' (RD_i)	$RD_i = N_i / \Sigma n$	n_i = number of individuals of species 'i'
		Σn = total number of individuals of all species (plots)
Cover for Species 'i' (C_i)	$C_i = a_i / A$	a_i = total area covered for species 'i'
		A = total area sampled
Relative Cover of Species 'i' (RC_i)	$RC_i = C_i / \Sigma C$	C_i = cover for species 'i'
		ΣC = sum of cover for all species
Frequency of Species 'i' (f_i)	$f_i = j_i / k$	j_i = number of plots containing species 'i'
		k = total number of plots
Relative Frequency of Species 'i' (RF_i)	$RF_i = f_i / \Sigma f$	f_i = frequency of species 'i'
		Σf = sum of frequencies of all species
Shannon Diversity Index (H')	$H = -\sum_{i=1}^{R} p_i \log p_i$	R = total number of species encountered
		p_i = species 'i' as a proportion of R

A-6.1.1 Shannon Diversity Index

A diversity index provides a more comprehensive indication of the vegetative composition beyond 'richness', which is simply the number of plant species observed to be present (either via quantitative surveys [e.g., transects, quadrats] or qualitative observation) in a habitat area. The Shannon Diversity Index accounts for plant species' relative abundance (i.e., commonness or scarcity) and 'evenness' (i.e., how evenly the individuals in the plant community are distributed over the landscape) in a habitat area, as expressed in the following equation (H = the Shannon Diversity Index).

$$H = -\sum_{i=1}^{R} (p_i \log p_i)$$

For the present application, p_i is the proportion of individuals of species 'i' relative to the total number of all individual plants (all species); 'R' is the number of plant species encountered; and $\sum$ is the sum from species 1 to species R. The highest potential value of 'H' (for a particular study area with 'R' number of species) occurs when all species are equally abundant in the sampling area (e.g., Species 1: 10 individuals; Species 2: 10 individuals … Species R: 10 individuals).

Higher values of 'H' represent more diverse biological communities. To illustrate, a weed-free orange grove with no other types of fruit trees present would have an 'H' value of 0, as 'p_i' would equal 1 (one type of fruit tree) and would be multiplied by 'log 1' which equals 0. Whatever method of sampling/counting the grove's composition, whatever numbers of samples are obtained, or in whatever locations, the same value (zero) of 'H' would result due to the singularity of fruit tree type throughout the grove. By contrast, if numerous different kinds of fruit trees are present—evenly distributed throughout the grove—then the 'H' value would be high, because each sample (in every location) would contain a diversity of fruit tree types; and the sum of the '$p_i \log p_i$' values would increase with each new species of fruit tree uniformly added to the grove's mix of trees.

A vegetation survey was performed on the Middle SPS reference site (see Exhibit 2) in 2013, and the survey results were included in the 2013 *Reference Site Survey Report – Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project* ("Reference Site Report"; BonTerra 2013), which was appended to the OWHRMP. The Reference Site Report and the OWHRMP have been revised (BonTerra Psomas 2016) to reflect a comparative recomputation of the value of 'H' on the reference site in 2013, based on the original field data. As shown in Table A-11, the values of 'H' on the reference site (derived from quadrat data) reflect the impact of the dense cover of ripgut grass (*Bromus diandrus*) on statistical diversity (i.e., with ripgut grass included in the computations, the value of 'H' approaches zero), whereas in excluding ripgut grass, the reference sites would exhibit low (CSS) to moderate (CS/CLORF) diversity. These results are relevant for OWHRMP performance because (1) despite the presence of numerous heritage oak and sycamore trees, the statistical diversity of the reference site in 2013 was vanishingly low due to its nearly monotypic, weedy understory and (2) the absence of a 'carpet' of weedy herbs on the mitigation site is expected to result in significantly higher diversity than the measured values on the reference site.

It is important to note that the Shannon Diversity Index does not necessarily indicate the ecological health of a study area, as there is no differentiation between native and non-native species (e.g., a study area with an abundance of diverse, evenly occurring weedy plant species would present a high value of 'H' but provide relatively poor ecosystem services compared to native vegetation).

TABLE A-11
SHANNON DIVERSITY INDEX – REFERENCE SITE (2013)

Habitat Type	Ripgut Brome Included in Computation[a]	Number of Plant Species[b]		Shannon Diversity Index = H[b]	
		Native	Non-Native	Result	Potential[c]
CS/CLORF[d]	**Yes**	**18**	**11**	**0.01**	**3.37**
	No	18	10	2.47	3.33
CSS[e]	**Yes**	**19**	**6**	**0.03**	**3.22**
	No	19	5	0.77	3.18

[a] Ripgut grass (*Bromus diandrus*—a non-native, invasive grass species) constituted a dense understory and was disproportionately represented on the CSS and CS/CLORF reference sites (BonTerra 2013) in terms of both percent cover and numbers of individual plants. For example, on Quadrat No. C-01 (CSS), the estimated number of individual *Bromus diandrus* plants was 155,000, while the total number of individual plants on Quadrat No. C-01 (all species combined) was 155,586 (i.e., 99.6 percent of all plants combined).
[b] Based on quadrat data.
[c] Based on the number of plant species (native + non-native) sampled.
[d] CS/CLORF: California sycamore/coast live oak riparian forest.
[e] CSS: coastal sage scrub.

A-6.2 MITIGATION REMEDIAL PROCEDURES

If the performance standards are not met, remedial measures shall be implemented based on site observations and survey results, as summarized in Tables A-12 and A-13.

TABLE A-12
OAK WOODLAND MITIGATION REMEDIAL PROCEDURES

Performance Standard	Noncompliance	Potential Remedial Measures
25%, 40%, 55%, 65%, and 75% cover of native species at Years 1, 2, 3, 4, and 5, respectively, and 75% for Years 6 through 10, and native plant cover goals for growth forms as listed in Table A-7.	>5% deviation below specified cover throughout 10% or more of the entire site (i.e., if 10% or more of the site is 5% below the cover standard, the entire site will be considered noncompliant).	Reseeding and replanting with appropriate plant species and quantities, irrigation system adjustments, and/or additional weed control shall be recommended, as needed, to facilitate <5% deviation below specified cover throughout 10% or more of the entire site, and 5% maximum weed cover.
5% maximum cover of non-native plant species.		
80% survival of oak trees.	Less than 80% survival.	Replanting, irrigation system adjustments, and/or additional weed control shall be recommended, as needed, to facilitate 80% survival of oak trees.
Minimum native plant species richness of 15, 18, 20, and 24 species at Years 3, 5, 7, and 10, respectively.	Plant species richness below the established minimum number of species for Years 3, 5, 7, and 10.	Planting and/or seeding with additional native plant species of local origin.
Shannon Diversity Index ('H') comparable to 2013 reference site values.	Values of 'H' below 2013 reference site values.	Enhancement measures to improve vegetative diversity (e.g., planting/seeding).

TABLE A-13
COASTAL SAGE SCRUB MITIGATION REMEDIAL PROCEDURES

Performance Standard	Noncompliance	Potential Remedial Measures
25%, 40%, 55%, 65%, and 75% cover of native species at Years 1, 2, 3, 4, and 5, respectively, and 75% for Years 6 through 10, and native plant cover goals for growth forms as listed in Table A-8.	>5% deviation below specified cover throughout 10% or more of the entire site (i.e., if 10% or more of the site is 5% below the cover standard, the entire site will be considered noncompliant).	Reseeding and replanting with appropriate plant species and quantities, irrigation system adjustments, and/or additional weed control shall be recommended, as needed, to facilitate <5% deviation below specified cover throughout 10% or more of the entire site, and 5% maximum weed cover.
5% maximum cover of non-native plant species.		
Minimum native plant species diversity of 10, 12, 15, and 18 species at Years 3, 5, 7, and 10, respectively.	Plant species richness below the established minimum number of species for Years 3, 5, 7, and 10.	Planting and/or seeding with additional native plant species of local origin.
Shannon Diversity Index ('H') comparable to 2013 reference site values.	Values of 'H' below 2013 reference site values.	Enhancement measures to improve vegetative diversity (e.g., planting/seeding).

A-6.3 MITIGATION SIGN OFF

When the final (Year Ten) performance standards have been achieved, and if at least seven years of maintenance have been completed, Public Works will meet on site with the CDFW, representatives of the City of Arcadia, and the Restoration Ecologist to verify the successful establishment of OW (developing) and CSS habitats. Upon its approval of the mitigation program, the CDFW will prepare a memorandum to confirm the completion of the program and the cessation of required maintenance and monitoring tasks. If the mitigation program does not meet performance standards in a timely manner and remedial measures to achieve program compliance are not feasible, an alternate mitigation program shall be identified by Public Works in coordination with the CDFW and the City of Arcadia. Alternate mitigation measures may include habitat creation/restoration at an alternate site(s), participation in an approved mitigation bank, or any other appropriate measure approved by Public Works. The selection of an alternate mitigation site will include the evaluation of geographic location (e.g., the Santa Anita Canyon vicinity), land ownership, elevation, slope steepness, aspect, soils, proximity to existing preserved native habitat, weed conditions, and other ecological and logistical factors. The planning and implementation of the alternate mitigation program will be the responsibility of Public Works.

ATTACHMENT B

SITE PHOTOGRAPHS

October 2021. Two healthy, drought-adapted, planted coast live oak trees. Approximately 61 percent of the planted oaks exceeded 10 feet in height, and approximately 38 percent of the oaks exceeded 12 feet in height, in spring 2022.

June 2022. Multiple planted oaks occur amid diverse native understory vegetation. A placed natural snag is visible to the left in photo.

April 2022. These planted oaks are surrounded by a dense carpet of native annual and perennial herbs. A placed assemblage of woody debris is visible in the foreground, and multiple placed natural snags are shown in the background.

December 2021. This photograph shows locally harvested seed (acorns) of rare Engelmann oak that were planted at several locations on the mitigation site in Year Seven.

April 2022. Newly germinated seedlings of Engelmann oak from acorns that were sown in December 2021.

August 2022. The first occurrence of fruit production on the planted oaks was observed in Year Seven. Shown in this photograph are Englemnann oak acorns.

Site Photographs

Attachment B-1

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

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June 2022. Planted and seeded vegetation on the coastal sage scrub mitigation site (foreground) with preserved woodland/scrub habitat shown in the background.

August 2022. The coastal sage scrub mitigation site includes planted patches of spiniferous species (cactus and yucca) to provide a more diverse mosaic of vegetation resources on the site.

February 2022. This photograph shows intensive hand-weeding tasks being performed by the Restoration Contractor (Nakae & Associates).

January/February 2022. Psomas' Biological Monitor periodically places smaller woody debris upright amongst the placed boulders to provide perches for birds and other wildlife species.

August 2022. These planted chaparral yucca plants are growing along the edge of a large placed boulder on the coastal sage scrub mitigation site.

July 2021. Multiple chaparral yucca plants have bloomed (left photo), and produced seed (right photo), on the mitigation site.

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Site Photographs

Attachment B-2

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

February 2022. Seed production was observed on this planted hollyleaf cherry shrub.

May 2022. Flowering was observed on planted heart-leaved penstemon.

December 2022. Abundant blooms were observed on native nightshade plants that were visited by bumblebees and other arthropods.

April 2022. Multiple species of native phacelia grow on the mitigation site, including the large-flowered phacelia shown in this photograph.

October 2021. Blooms were observed on native hairy cudweed.

April 2022. This photograph shows the recruitment of seedlings of native spectacular beardtongue (center of photo) and native foothill needle grass (right in photo).

Site Photographs

Attachment B-3

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

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October 2021. The vegetation in the spiraling drainages on the mitigation site exhibited marked desiccation and dormancy during a period of extended drought.

May 2022. This photograph shows the same drainage areas as the image to the left on this page. The vegetation is shown responding to improved seasonal rainfall in Year Seven.

April 2022. The drainages have temporary standing water that supports breeding native Baja California tree frogs. The riparian vegetation includes lovegrass flatsedge (left in photo) and basket rush (right in photo).

December 2021. To improve native vegetation cover and diversity, the Restoration Contractor (Nakae & Associates) is shown scratching native seeds along the drainages, under the supervision of Psomas' Biological Monitor.

December 2021. Portions of the drainages support dense growth of riparian shrubs such as this thicket of planted California rose. Sprangletop, a native perennial grass species, is shown in the foreground with placed woody debris.

December 2021. The canopies of the planted oaks, such as the coast live oak sapling shown to the left in this photograph, will eventually extend over the spiraling drainages as the oak plantings reach their mature size.

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Site Photographs

Attachment B-4

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

December 2021. This photograph shows a native coffee fern that was strategically installed along the eastern aspect of a placed natural log. Approximately 600 native ferns have been planted on the mitigation site since 2014.

December 2021. A newly installed coffee fern planted along the eastern aspect of a placed boulder. To improve fern growth and survival, the root ball of the container plant was placed in a cavity dug beneath the boulder.

December 2021. New fronds of California polypody, a previously installed native fern species, are emerging in response to seasonal rains. These ferns are arising within an assemblage of placed boulders and coarse woody debris**.**

April 2022. A placed assemblage of boulders and woody debris is weathering over time on the mitigation site. A placed 'mini-snag' is shown in the foreground, and a large placed snag is visible in the background.

February 2022. Bryant's wood rat, a California State Species of Special Concern, has occupied several of the boulder assemblages on the mitigation site including the photo to the left on this page.

November 2021. Lewis's woodpecker, an uncommon visitor to local foothills habitats, was detected via camera trap atop one of the placed snags.

Site Photographs

Attachment B-5

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

August 2013. Photo Station No. 1.

November 2013. Photo Station No. 3.

September 2013. Photo Station No. 5.

August 2022. Photo Station No. 1.

August 2022. Photo Station No. 3.

August 2022. Photo Station No. 5.

Site Photographs

Attachment B-6

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

September 2013. Photo Station No. 2.

August 2022. Photo Station No. 2.

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Site Photographs

Attachment B-7

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

January 2013. Photo Station No. 4.

August 2022. Photo Station No. 4.

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Site Photographs

Attachment B-8

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

July 2013. Photo Station No. 6.

May 2014. Photo Station No. 8. This photographs shows vegetation conditions shortly after the completion (in January 2014) of initial planting and seeding tasks.

August 2009. Photo Station No. 9.

October 2022. Photo Station No. 6.

October 2022. Photo Station No. 8.

August 2022. Photo Station No. 9.

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Site Photographs

Attachment B-9

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

July 2013. Photo Station No. 7.

August 2022. Photo Location No. 7.

Site Photographs

Attachment B-10

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

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March 2022. Oak woodland Transect No. 1.

March 2022. Oak woodland Transect No. 2.

March 2022. Oak woodland Transect No. 3.

March 2022. Oak woodland Transect No. 4.

March 2022. Oak woodland Transect No. 5.

March 2022. Oak woodland Transect No. 6.

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Site Photographs

Attachment B-11

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

March 2022. Coastal sage scrub Transect No. 1.

March 2022. Coastal sage scrub Transect No. 2.

March 2022. Coastal sage scrub Transect No. 3.

March 2022. Coastal sage scrub Transect No. 4.

March 2022. Coastal sage scrub (CSS) Transect No. 5.

May 2021. No photo was recorded for CSS Transect No. 5 in 2022. This photo shows representative vegetative cover conditions in the vicinity of CSS Transect No. 5 in Year Seven of the maintenance period.

March 2022. Oak woodland Quadrat No. 1.

March 2022. Oak woodland Quadrat No. 2.

March 2022. Oak woodland Quadrat No. 3.

March 2022. Oak woodland Quadrat No. 4.

March 2022. Oak woodland Quadrat No. 5.

March 2022. Oak woodland Quadrat No. 6.

Site Photographs

Attachment B-13

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

(09/26/2023 SAK) R:\Projects\DPW156\3DPW870201 (prev 3DPW151407)\Graphics\7AMR\Att_SP.pdf

March 2022. Coastal sage scrub Quadrat No. 1.

March 2022. Coastal sage scrub Quadrat No. 2.

March 2022. Coastal sage scrub Quadrat No. 3.

July 2013. The oak woodland reference site (Middle Sediment Placement Site [SPS]). Although the reference site contains numerous mature coast live oak and western sycamore trees, the understory vegetation is predominantly weedy (e.g., ripgut brome [grass]).

January 2011. The coastal sage scrub reference site (Middle SPS) exhibits patches of native scrub and a dense understory of weedy grasses and herbs.

October 2012. The Middle SPS reference site contains some natural boulders and coarse woody debris, which are beneficial habitat features that are being recreated on the Lower SPS mitigation site.

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Site Photographs

Attachment B-14

Seventh Annual Monitoring Report: Oak Woodland Habitat Revegetation/Mitigation Program
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

PSOMAS

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ATTACHMENT C

QUADRAT DATA – YEAR SEVEN (2022)

TABLE C-1
COASTAL SAGE SCRUB QUADRAT DATA AND COMPUTATIONS – YEAR SEVEN (2022)

Quadrat Data and Statistics (6 x 20' x 40' = 4,800 Square Feet Total)																		
		Cover[a]				No. of Individual Plants			Vegetation Metrics[b]									
Vascular Plant Species	**Habit**	**CSS-Q1**	**CSS-Q2**	**CSS-Q3**	**Mean**	**CSS-Q1**	**CSS-Q2**	**CSS-Q3**	**D_i**	**RD_i**	**C_i**	**RC_i**	**f_i**	**Rf_i**	**p_i**	**$p_i \log p_i$**	**H'**	**Potential H'**
Native																		
Acmispon glaber var. *glaber*	subshrub	10.00	0.00	0.00	**3.33**	21	0	0	0.01	0.01	0.03	0.05	0.33	0.03	0.01	-0.03	**0.84**	**3.09**
Artemisia californica	medium	15.00	7.00	6.00	**9.33**	8	30	30	0.03	0.02	0.09	0.14	1.00	0.09	0.02	-0.09		
Camissoniopsis hirtella	herb	0.10	0.10	1.00	**0.40**	2	6	55	0.03	0.02	0.00	0.01	1.00	0.09	0.02	-0.08		
Clarkia purpurea ssp. *quadrivulnera*	herb	0.10	0.00	0.00	**0.03**	11	0	0	0.00	0.00	0.00	0.00	0.33	0.03	0.00	-0.02		
Eriogonum elongatum var. *elongatum*	herb	10.00	0.00	0.00	**3.33**	28	0	0	0.01	0.01	0.03	0.05	0.33	0.03	0.01	-0.04		
Eriogonum fasciculatum var. foliolosum	medium	30.00	20.00	50.00	**33.33**	27	18	15	0.03	0.02	0.33	0.49	1.00	0.09	0.02	-0.08		
Eulobus californicus	herb	0.00	0.00	0.10	**0.03**	0	0	1	0.00	0.00	0.00	0.00	0.33	0.03	0.00	0.00		
Hesperoyucca whipplei	succulent[c]	2.00	1.00	0.00	**1.00**	3	1	3	0.00	0.00	0.01	0.01	1.00	0.09	0.00	-0.01		
Lupinus hirsutissimus	herb	0.00	0.00	0.10	**0.03**	0	0	1	0.00	0.00	0.00	0.00	0.33	0.03	0.00	0.00		
Malosma laurina	large	0.00	15.00	0.00	**5.00**	0	1	0	0.00	0.00	0.05	0.07	0.33	0.03	0.00	0.00		
Marah macrocarpa	herb	0.00	0.10	0.00	**0.03**	1	0	0	0.00	0.00	0.00	0.00	0.33	0.03	0.00	0.00		
Opuntia vaseyi	succulent[c]	10.00	0.00	1.00	**3.67**	3	0	2	0.00	0.00	0.04	0.05	0.67	0.06	0.00	-0.01		
Phacelia distans	herb	0.00	0.00	0.10	**0.03**	0	0	5	0.00	0.00	0.00	0.00	0.33	0.03	0.00	-0.01		
Rhus ovata	herb	0.00	2.00	0.00	**0.67**	0	2	0	0.00	0.00	0.01	0.01	0.33	0.03	0.00	0.00		
Salvia mellifera	medium	0.10	0.00	0.00	**0.03**	2	0	0	0.00	0.00	0.00	0.00	0.33	0.03	0.00	0.00		
Non-native																		
Bromus diandrus		0.10	0.10	0.10	**0.10**	20	15	1	0.02	0.01	0.00	0.00	1.00	0.09	0.01	-0.05		
Bromus rubens		0.00	0.10	0.00	**0.03**	0	10	0	0.00	0.00	0.00	0.00	0.33	0.03	0.00	-0.02		
Erodium cicutarium		1.00	0.00	0.00	**0.33**	49	0	0	0.02	0.02	0.00	0.00	0.33	0.03	0.02	-0.07		
Festuca myuros (mowed)		20.00	0.00	0.00	**6.67**	2,500	0	0	1.04	0.84	0.07	0.10	0.33	0.03	0.84	-0.15		
Festuca myuros (not mowed)		0.00	0.10	0.00	**0.03**	0	22	0	0.01	0.01	0.00	0.00	0.33	0.03	0.01	-0.04		
Hypochaeris glabra		0.10	0.00	0.00	**0.03**	33	0	0	0.01	0.01	0.00	0.00	0.33	0.03	0.01	-0.05		
Schisumus barbatus		0.00	0.00	0.10	**0.03**	0	0	50	0.02	0.02	0.00	0.00	0.33	0.03	0.02	-0.07		
Absolute Cover																		
Total Absolute Native Species Cover		77.30	45.20	58.30	**60.27**													
Total Absolute Non-Native Species Cover		21.20	0.30	0.20	**7.23**													
Total Absolute Coverage (All)		98.50	45.50	58.50	**67.50**													
Ground Cover																		
Bare Soil		5.00	30.00	15.00	**16.67**													
Boulder/Rock/Cobble		4.00	0.00	1.00	**1.67**													
Coarse Woody Debris		5.00	5.00	0.00	**3.33**													
Fine Woody Debris		10.00	5.00	15.00	**10.00**													
Leaf Litter		72.00	60.00	68.00	**66.67**													
Other: PVC pipe		4.00	0.00	1.00	**2.50**													

[a] Measured via performance of three 20-foot by 40-foot quadrats.
[b] The definitions of the vegetation metrics are provided in Table A-10.
[c] Category described as 'succulents' in the Oak *Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal* Project (BonTerra Psomas 2014).

TABLE C-2
OAK WOODLAND QUADRAT DATA AND COMPUTATIONS – YEAR SEVEN (2022)

Oak Woodland Quadrat Data and Statistics (6 x 20' x 40' = 4,800 Square Feet Total)																							
		Cover							No. of Individual Plants														
Vascular Plant Species	Habit	OW-Q1	OW-Q2	OW-Q3	OW-Q4	OW-Q5	OW-Q6	Mean	OW-Q1	OW-Q2	OW-Q3	OW-Q4	OW-Q5	OW-Q6	D_i	RD_i	C_i	RC_i	f_i	Rf_i	p_i	$p_i \log p_i$	H'	Potential H'
Native																							
Acmispon glaber var. *glaber*	subshrub	5.00	0.00	5.00	10.00	2.00	2.00	**4.00**	9	0	10	18	9	5	0.01	0.02	0.04	0.07	0.83	0.05	0.02	-0.09	**2.49**	**4.01**
Acmispon hamatus	herb	0.00	0.00	0.10	0.00	0.00	0.10	**0.03**	0	0	23	0	0	35	0.01	0.03	0.00	0.00	0.33	0.02	0.03	-0.09		
Amsinckia menziesii	herb	0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	1	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Artemisia californica	medium	2.00	2.00	2.00	0.00	4.00	2.00	**2.00**	10	1	5	0	8	1	0.01	0.01	0.02	0.03	0.83	0.05	0.01	-0.05		
Artemisia douglasiana	herb	20.00	6.00	2.00	2.00	0.00	0.00	**5.00**	1	30	13	5	0	0	0.01	0.02	0.05	0.09	0.67	0.04	0.02	-0.08		
Baccharis pilularis ssp. *consanguinea*	large	0.00	0.00	20.00	0.00	0.00	0.00	**3.33**	0	0	1	0	0	0	0.00	0.00	0.03	0.06	0.17	0.01	0.00	0.00		
Baccharis salicifolia ssp. *salicifolia*	large	0.00	35.00	0.00	18.00	0.00	8.00	**10.17**	0	27	0	4	0	1	0.01	0.01	0.10	0.17	0.50	0.03	0.01	-0.06		
Brickellia californica	medium	0.00	0.00	0.00	0.00	0.00	1.00	**0.17**	0	0	0	0	0	4	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Calystegia macrostegia	herb	0.10	0.00	0.00	0.00	0.00	0.00	**0.02**	1	0	0	0	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Camissoniopsis hirtella	herb	0.00	0.00	1.00	0.00	0.10	1.00	**0.35**	0	0	40	0	10	110	0.03	0.07	0.00	0.01	0.50	0.03	0.07	-0.19		
Cardamine oligosperma	herb	0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	25	0	0.01	0.01	0.00	0.00	0.17	0.01	0.01	-0.05		
Ceanothus crassifolius	large	0.00	0.00	0.00	0.00	0.00	1.00	**0.17**	0	0	0	0	0	1	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Ceanothus leucodermis	large	0.00	0.00	0.00	15.00	0.00	0.00	**2.50**	0	0	0	1	0	0	0.00	0.00	0.03	0.04	0.17	0.01	0.00	0.00		
Chaenactis sp.	herb	0.00	0.00	0.00	0.00	0.00	0.10	**0.02**	0	0	0	0	0	1	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Clarkia sp.	herb	1.00	0.10	0.10	0.10	1.00	0.10	**0.40**	60	3	50	56	110	41	0.07	0.14	0.00	0.01	1.00	0.05	0.14	-0.28		
Cyperus eragrostis	herb	0.00	5.00	0.10	0.00	0.00	0.00	**0.85**	0	23	1	0	0	0	0.01	0.01	0.01	0.01	0.33	0.02	0.01	-0.05		
Elymus condensatus	herb	0.00	0.00	2.00	0.00	0.00	2.00	**0.67**	0	0	2	0	0	4	0.00	0.00	0.01	0.01	0.33	0.02	0.00	-0.02		
Encelia californica	medium	10.00	0.00	0.00	0.00	0.00	0.00	**1.67**	3	0	0	0	0	0	0.00	0.00	0.02	0.03	0.17	0.01	0.00	-0.01		
Epilobium brachycarpum	herb	0.10	0.00	0.00	0.00	0.00	1.00	**0.18**	1	0	0	0	0	1	0.00	0.00	0.00	0.00	0.33	0.02	0.00	-0.01		
Eriogonum elongatum	herb	2.00	0.00	0.00	0.00	0.00	0.00	**0.33**	6	0	0	0	0	0	0.00	0.00	0.00	0.01	0.17	0.01	0.00	-0.02		
Eriogonum fasciculatum var. *foliolosum*	medium	20.00	0.00	4.00	0.00	3.00	15.00	**7.00**	11	0	3	0	4	4	0.00	0.01	0.07	0.12	0.67	0.04	0.01	-0.05		
Eucrypta chrysanthemifolia	herb	0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	2	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Eulobus californica	herb	0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	1	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Heteromeles arbutifolia	large	0.00	1.00	0.00	0.00	0.00	0.00	**0.17**	0	3	0	0	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Heterotheca grandiflora	herb	0.00	0.00	0.00	0.10	0.10	0.00	**0.03**	0	0	0	2	1	0	0.00	0.00	0.00	0.00	0.33	0.02	0.00	-0.01		
Juncus textilis	herb	0.00	1.00	0.00	0.00	0.00	0.00	**0.17**	0	4	0	0	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Juncus xiphioides	herb	0.00	1.00	0.00	0.00	0.00	0.00	**0.17**	0	15	0	0	0	0	0.00	0.01	0.00	0.00	0.17	0.01	0.01	-0.03		
Leptochloa fusca ssp. *uninervia*	herb	0.00	0.00	0.00	2.00	0.00	0.00	**0.33**	0	0	0	1	0	0	0.00	0.00	0.00	0.01	0.17	0.01	0.00	0.00		
Lupinus hirsutissimus	herb	0.00	0.00	0.00	0.10	0.00	0.00	**0.02**	0	0	0	1	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Malosma laurina	large	0.00	5.00	0.00	0.00	0.00	0.00	**0.83**	0	2	0	0	0	0	0.00	0.00	0.01	0.01	0.17	0.01	0.00	-0.01		
Oenothera elata	herb	1.00	0.00	0.00	0.00	0.00	0.00	**0.17**	1	0	0	0	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Opuntia vaseyi	succulent[a]	0.00	0.00	0.00	0.00	3.00	0.00	**0.50**	0	0	0	0	1	0	0.00	0.00	0.01	0.01	0.17	0.01	0.00	0.00		
Pellea andromedifolia	herb	0.00	0.00	0.10	0.00	0.10	0.00	**0.03**	0	0	1	0	1	0	0.00	0.00	0.00	0.00	0.33	0.02	0.00	-0.01		
Penstemon spectabilis	herb	0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	1	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Phacelia distans	herb	0.00	0.00	0.10	0.00	0.10	0.00	**0.03**	0	0	15	0	3	0	0.00	0.01	0.00	0.00	0.33	0.02	0.01	-0.04		
Phacelia ramosissima	herb	1.00	0.00	0.10	0.10	0.10	1.00	**0.38**	8	0	2	11	1	7	0.01	0.01	0.00	0.01	0.83	0.05	0.01	-0.06		
Pseudognaphalium stramineum	herb	0.00	0.00	0.00	0.00	1.00	0.00	**0.17**	0	0	0	0	50	0	0.01	0.02	0.00	0.00	0.17	0.01	0.02	-0.08		
Quercus agrifolia var. *agrifolia*	tree	20.00	20.00	0.10	1.00	2.00	12.00	**9.18**	2	2	1	1	2	1	0.00	0.00	0.09	0.16	1.00	0.05	0.00	-0.02		
Rhus aromatica	medium	0.00	0.00	0.00	0.00	0.00	2.00	**0.33**	0	0	0	0	0	1	0.00	0.00	0.00	0.01	0.17	0.01	0.00	0.00		
Ribes aureum var. *gracillimum*	medium	0.00	5.00	2.00	0.00	1.00	0.00	**1.33**	1	1	1	0	1	0	0.00	0.00	0.01	0.02	0.67	0.04	0.00	-0.01		
Rosa californica	medium	0.00	0.00	0.00	1.00	0.00	0.00	**0.17**	0	0	0	2	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		

TABLE C-2
OAK WOODLAND QUADRAT DATA AND COMPUTATIONS – YEAR SEVEN (2022)

Oak Woodland Quadrat Data and Statistics (6 x 20' x 40' = 4,800 Square Feet Total)																							
		Cover							No. of Individual Plants														
Vascular Plant Species	**Habit**	**OW-Q1**	**OW-Q2**	**OW-Q3**	**OW-Q4**	**OW-Q5**	**OW-Q6**	**Mean**	**OW-Q1**	**OW-Q2**	**OW-Q3**	**OW-Q4**	**OW-Q5**	**OW-Q6**	**D_i**	**RD_i**	**C_i**	**RC_i**	**f_i**	**Rf_i**	**p_i**	**$p_i \log p_i$**	**H'**	**Potential H'**
Sambucus nigra ssp. *caerulea*	tree	0.00	0.00	3.00	0.00	0.00	1.00	**0.67**	0	0	2	0	0	10	0.00	0.01	0.01	0.01	0.33	0.02	0.01	-0.03		
Solanum douglasii	herb	0.00	0.00	0.10	0.00	1.00	0.00	**0.18**	0	0	1	0	1	0	0.00	0.00	0.00	0.00	0.33	0.02	0.00	-0.01		
Stipa lepida	herb	1.00	0.00	0.00	0.10	0.10	0.00	**0.20**	5	0	0	1	4	0	0.00	0.00	0.00	0.00	0.50	0.03	0.00	-0.02		
Non-Native																								
Anthriscus caucalis		0.00	0.10	0.00	0.00	0.00	0.00	**0.02**	0	17	0	0	0	0	0.00	0.01	0.00	0.00	0.17	0.01	0.01	-0.04		
Bromus diandrus		0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	10	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.02		
Bromus rubens		0.00	1.00	1.00	0.00	0.00	0.00	**0.33**	0	20	36	0	0	0	0.01	0.03	0.00	0.01	0.33	0.02	0.02	-0.09		
Centaurea melitensis		0.00	0.00	0.00	0.10	0.00	0.00	**0.02**	0	0	0	1	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	0.00		
Erodium cicutarium		0.00	0.00	0.00	0.10	1.00	0.10	**0.20**	0	0	0	2	36	10	0.01	0.02	0.00	0.00	0.50	0.03	0.02	-0.08		
Euphorbia peplus		1.00	0.00	0.00	0.00	0.00	0.10	**0.18**	45	0	0	0	0	21	0.01	0.03	0.00	0.00	0.33	0.02	0.03	-0.10		
Festuca myuros (mowed)		0.00	0.00	2.00	20.00	0.00	0.10	**3.68**	0	0	50	500	0	100	0.14	0.29	0.04	0.06	0.50	0.03	0.29	-0.36		
Festuca myuros (not mowed)		0.00	1.00	0.10	0.00	0.10	0.10	**0.22**	0	70	40	0	12	300	0.09	0.19	0.00	0.00	0.67	0.04	0.19	-0.31		
Medicago polymorpha		0.00	0.00	0.00	0.00	0.10	0.00	**0.02**	0	0	0	0	2	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Poa annua		0.10	0.00	0.00	0.00	0.00	0.00	**0.02**	5	0	0	0	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Schismus barbatus		0.10	0.00	0.00	0.00	0.00	0.00	**0.02**	5	0	0	0	0	0	0.00	0.00	0.00	0.00	0.17	0.01	0.00	-0.01		
Absolute Cover																								
Total Absolute Native Species Cover		83.20	81.10	41.80	49.50	19.10	49.30	**54.00**																
Total Absolute Non-Native Species Cover			1.20	2.10	3.10	20.20	1.30	0.40																
Total Absolute Cover (All)		84.40	83.20	44.90	69.70	20.40	49.70	**58.72**																
Ground Cover																								
Bare Soil		10.00	3.00	2.00	3.00	25.00	20.00	**10.50**																
Boulder/Rock/Cobble		2.00	6.00	2.00	5.00	10.00	20.00	**7.50**																
Coarse Woody Debris or Snags		5.00	0.00	1.00	10.00	10.00	10.00	**6.00**																
Fine Woody Debris		20.00	47.00	50.00	15.00	15.00	18.00	**27.50**																
Leaf Litter		61.00	43.00	43.00	67.00	34.00	30.00	**46.33**																
PVC pipe		2.00	1.00	2.00	0.00	6.00	2.00	**2.17**																

[a] Category described as 'succulents' in the *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal* Project (BonTerra Psomas 2014).

ATTACHMENT D

TRANSECT DATA – YEAR SEVEN (2022)

TABLE D-1
COASTAL SAGE SCRUB TRANSECT DATA – YEAR SEVEN (2022)

Plant Species	Habit	Transect Number (50-ft Transects)												Mean % Cover	C_i	RC_i
		T-C1		T-C2		T-C3		T-C4		T-C5		T-C6				
		Hits	% Cover	Hits	% Cover	Hits	% Cover	Hits	% Cover	Hits	% Cover	Hits	% Cover			
Native																
Acmispon glaber var. *glaber*	subshrub	0	0	5	10	0	0	3	6	0	0	0	0	**2.67**	0.026667	0.031250
Artemisia californica	medium	0	0	1	2	3	6	4	8	22	44	10	20	**13.33**	0.133333	0.156250
Baccharis salicifolia ssp. *salicifolia*	large	0	0	0	0	0	0	0	0	0	0	9	18	**3.00**	0.030000	0.035156
Datura wrightii	herb	0	0	0	0	0	0	6	12	0	0	0	0	**2.00**	0.020000	0.023438
Encelia californica	medium	0	0	0	0	8	16	0	0	0	0	0	0	**2.67**	0.026667	0.031250
Eriogonum fasciculatum var. *foliolosum*	medium	21	42	31	62	36	72	16	32	27	54	11	22	**47.33**	0.473333	0.554688
Hesperoyucca whipplei	succulent	0	0	0	0	0	0	7	14	0	0	2	4	**3.00**	0.030000	0.035156
Heteromeles arbutifolia	large	0	0	0	0	0	0	0	0	0	0	10	20	**3.33**	0.033333	0.039063
Marah macrocarpa	herb	0	0	0	0	0	0	0	0	0	0	7	14	**2.33**	0.023333	0.027344
Opuntia vaseyi	succulent	0	0	0	0	0	0	2	4	0	0	0	0	**0.67**	0.006667	0.007813
Phacelia ramosissima	herb	0	0	0	0	0	0	0	0	0	0	1	2	**0.33**	0.003333	0.003906
Salvia mellifera	medium	0	0	3	6	0	0	0	0	0	0	5	10	**2.67**	0.026667	0.031250
Non-Native																
Bromus rubens		0	0	0	0	0	0	1	2	0	0	0	0	**0.33**	0.003333	0.003906
Erodium cicutarium		0	0	2	4	0	0	0	0	0	0	0	0	**0.67**	0.006667	0.007813
Non-native grass		0	0	3	6	0	0	0	0	0	0	0	0	**1.00**	0.010000	0.011719
Absolute Percent Cover																
Total Absolute Native Species Cover		21	42	40	80	47	94	38	76	49	98	55	110	**83.33**		
Total Absolute Non-Native Species Cover		0	0	5	10	0	0	1	2	0	0	0	0	**2.00**		
Total Absolute Cover (All)		21	42	45	90	47	94	39	78	49	98	55	110	**85.33**		
Class Percent Cover																
Native		20	40	36	72	43	86	33	66	37	74	38	76	**69.00**		
Non-Native		0	0	4	8	0	0	1	2	0	0	0	0	**1.67**		
Both		0	0	1	2	0	0	0	0	0	0	0	0	**0.33**		
No Plant		30	60	9	18	7	14	16	32	13	26	12	24	**29.00**		
Summary																
Total Native Class Cover		20	40	37	74	43	86	33	66	37	74	38	76	**69.33**		
Total Non-Native Class Cover		0	0	5	10	0	0	1	2	0	0	0	0	**2.00**		
Total Unvegetated		30	60	9	18	7	14	16	32	13	26	12	24	**29.00**		
Ground Cover																
Bare Soil		5	10	1	2	2	4	1	2	6	12	2	4	**5.67**		
Leaf Litter		4	8	10	20	4	8	0	0	2	4	13	26	**11.00**		
Fine Woody Debris (<1" diameter)		20	40	32	64	44	88	49	98	42	84	34	68	**73.67**		
Coarse Woody Debris (>1" diameter)		0	0	0	0	0	0	0	0	0	0	1	2	**0.33**		
PVC pipe		2	4	1	2	0	0	0	0	0	0	0	0	**1.00**		
V-ditch		16	32	5	10	0	0	0	0	0	0	0	0	**7.00**		
Moss		3	6	1	2	0	0	0	0	0	0	0	0	**1.33**		

TABLE D-2
OAK WOODLAND TRANSECT DATA – YEAR SEVEN (2022)

Plant Species	Habitat	Transect Number (100-ft Transects; Hits = Percent Cover)							C_i	RC_i
		T-O1	T-O2	T-O3	T-O4	T-O5	T-O6	Mean % Cover		
Native										
Acmispon glaber var. *glaber*	subshrub	17	0	8	2	0	1	**4.67**	0.046667	0.054369
Acmispon americanus var. *americanus*	herb	3	0	0	0	0	0	**0.50**	0.005000	0.005825
Artemisia californica	medium	13	3	0	0	21	14	**8.50**	0.085000	0.099029
Artemisia douglasiana	herb	0	0	0	3	0	0	**0.50**	0.005000	0.005825
Baccharis salicifolia ssp. *salicifolia*	large	0	8	9	0	0	0	**2.83**	0.028333	0.033010
Camissoniopsis hirtella	herb	0	3	0	0	0	0	**0.50**	0.005000	0.005825
Cardamine oligosperma	herb	0	0	0	1	0	0	**0.17**	0.001667	0.001942
Ceanothus oliganthus	large	0	0	0	0	0	1	**0.17**	0.001667	0.001942
Clarkia purpurea ssp. *quadrivulnera*	herb	8	19	6	0	2	0	**5.83**	0.058333	0.067961
Crassula colligata ssp. *lamprosperma*	herb	0	12	0	0	0	0	**2.00**	0.020000	0.023301
Cyperus eragrostis	herb	1	0	0	0	0	0	**0.17**	0.001667	0.001942
Elymus condensatus	herb	0	0	0	0	10	0	**1.67**	0.016667	0.019417
Epilobium brachycarpum	herb	0	0	0	1	0	0	**0.17**	0.001667	0.001942
Eriogonum fasciculatum var. *foliolosum*	medium	2	21		9	25	59	**19.33**	0.193333	0.225243
Helianthus annuus	herb	0	0	2	0	0	0	**0.33**	0.003333	0.003883
Hesperoyucca whipplei	herb	0	0	0	0	0	8	**1.33**	0.013333	0.015534
Leptochloa fusca ssp. *uninervia*	herb	0	0	2	2	0	0	**0.67**	0.006667	0.007767
Malosma laurina	large	0	0	7	1	0	0	**1.33**	0.013333	0.015534
Marah macrocarpa	herb	0	0	0	1	0	4	**0.83**	0.008333	0.009709
Opuntia vaseyi	succulent	2	0	0	0	0	0	**0.33**	0.003333	0.003883
Pellaea andromedifolia	herb	0	0	0	0	1	0	**0.17**	0.001667	0.001942
Phacelia ramosissima	herb	1	1	3	10	10	0	**4.17**	0.041667	0.048544
Quercus agrifolia var. *agrifolia*	tree	6	0	0	3	11	26	**7.67**	0.076667	0.089320
Rhus ovata	large	0	0	0	16	0	2	**3.00**	0.030000	0.034951
Rubus ursinus	medium	7	0	0	0	0	0	**1.17**	0.011667	0.013592
Salvia apiana	medium	0	0	0	0	0	2	**0.33**	0.003333	0.003883
Salvia mellifera	medium	0	12	0	0	10	4	**4.33**	0.043333	0.050485
Sambucus nigra ssp. *caerulea*	tree	1	0	0	0	0	0	**0.17**	0.001667	0.001942
Solanum americanum	herb	0	0	0	1	0	0	**0.17**	0.001667	0.001942

TABLE D-2
OAK WOODLAND TRANSECT DATA – YEAR SEVEN (2022)

Plant Species	Habitat	Transect Number (100-ft Transects; Hits = Percent Cover)							C_i	RC_i
		T-O1	T-O2	T-O3	T-O4	T-O5	T-O6	Mean % Cover		
Stipa lepida	herb	0	1	3	1	0	0	**0.83**	0.008333	0.009709
Non-Native										
Bromus diandrus		0	0	0	0	1	3	**0.67**	0.006667	0.007767
Bromus rubens		5	0	4	5	0	0	**2.33**	0.023333	0.027184
Erodium cicutarium		0	0	1	0	0	0	**0.17**	0.001667	0.001942
Euphorbia peplus		0	1	0	0	0	0	**0.17**	0.001667	0.001942
Festuca myuros		4	7	7	3	0	0	**3.50**	0.035000	0.040777
Melilotus sp.		0	1	0	0	0	0	**0.17**	0.001667	0.001942
Non-native grasses (mowed)		7	0	4	3	0	0	**2.33**	0.023333	0.027184
Non-native grasses (not mowed)		0	0	13	2	0	1	**2.67**	0.026667	0.031068
Absolute Percent Cover										
Total Absolute Native Species Cover		61	80	40	51	90	121	**73.83**		
Total Absolute Non-Native Species Cover		16	9	29	13	1	4	**12.00**		
Total Absolute Cover (All)		77	89	69	64	91	125	**85.83**		
Class Percent Cover										
Native		46	47	25	42	71	82	**52.17**		
Non-Native		12	18	19	8	0	0	**9.50**		
Both		5	22	10	6	1	4	**8.00**		
No Plant		37	13	46	44	28	14	**30.33**		
Summary										
Total Native Class Cover		51	69	35	48	72	86	**60.17**		
Total Non-Native Class Cover		17	40	29	14	1	4	**17.50**		
Total Unvegetated		37	13	46	44	28	14	**30.33**		
Ground Cover										
Bare Soil		20	13	10	11	11	0	**10.83**		
Boulder/Rock/Cobble		2	0	3	0	4	2	**1.83**		
Leaf Litter		25	23	57	49	25	19	**33.00**		
Fine Woody Debris (<1” diameter)		45	59	20	31	52	79	**47.67**		
Coarse Woody Debris (>1" diameter)		7	0	1	5	5	0	**3.00**		
Sand bag		0	0	8	1	0	0	**1.50**		

TABLE D-2
OAK WOODLAND TRANSECT DATA – YEAR SEVEN (2022)

Plant Species	Habitat	Transect Number (100-ft Transects; Hits = Percent Cover)							C_i	RC_i
		T-O1	T-O2	T-O3	T-O4	T-O5	T-O6	Mean % Cover		
PVC pipe		0	3	1	2	1	0	**1.17**		
Moss		1	2	0	1	2	0	**1.00**		

[a] Category described as 'succulents' in the *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal* Project (BonTerra Psomas 2014).

ATTACHMENT E

OAK TREE ASSESSMENT DATA – YEAR SEVEN (2022)

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
1	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	8.0	8.0	50.27	4	3.0
2	No Plant										
3	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.00	1.50	3.50	11.0	10.0	78.54	4	7.0
4	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	14.0	7.0	38.48	4	7.0
5	No Plant										
6	San Gabriel oak	*Quercus durata* var. *gabrielensis*	2	0.50	0.50	1.00	3.0	3.0	7.07	4	3.0
7	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	12.0	9.0	63.62	4	8.0
8	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	8.0	7.0	38.48	2	2.0
9	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	13.0	8.0	50.27	2	2.0
10	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	7.0	7.0	38.48	4	2.0
11	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	12.0	8.0	50.27	4	2.0
12	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	10.0	8.0	50.27	4	1.0
13	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	13.0	9.0	63.62	4	3.0
14	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	14.0	9.0	63.62	4	1.0
15	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	10.0	8.0	50.27	4	4.0
16	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	12.0	8.0	50.27	3	1.0
17	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	3.5	2.0	3.14	4	2.0
18	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	9.0	8.0	50.27	3	1.0
19	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	12.0	6.0	28.27	3	3.0
20	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	12.0	7.0	38.48	4	1.0
21	No Plant										
22	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	6.0	5.0	19.64	4	3.0
23	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	13.0	12.0	113.10	4	3.0
24	No Plant										
25	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	8.0	7.0	38.48	1	0.0
26	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	11.0	8.0	50.27	4	2.0
27	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	14.0	10.0	78.54	4	3.0
28	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	13.0	13.0	132.73	4	2.0
29	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	16.0	11.0	95.03	4	2.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
30	San Gabriel oak	*Quercus durata* var. *gabrielensis*	3	0.15	0.15	0.30	2.0	1.0	0.79	3	0.0
31	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	3.00	1.75	4.75	14.0	13.0	132.73	4	1.0
32	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	10.0	78.54	4	4.0
33	No Plant										
34	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.50	3.25	10.0	8.0	50.27	4	4.0
35	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	11.0	7.0	38.48	4	4.0
36	No Plant										
37	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	3.0	1.5	1.77	4	1.0
38	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	10.0	8.0	50.27	3	1.0
39	No Plant										
40	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	9.0	7.0	38.48	4	2.0
41	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	7.0	5.0	19.64	4	1.0
42	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	9.0	9.0	63.62	4	3.0
43	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	14.0	9.0	63.62	4	2.0
44	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	13.0	9.0	63.62	4	4.0
45	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	15.0	9.0	63.62	4	2.0
46	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	10.0	9.0	63.62	4	4.0
47	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.50	1.50	4.00	8.0	10.0	78.54	4	8.0
48	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	13.0	9.0	63.62	4	3.0
49	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	10.0	5.0	19.64	4	4.0
50	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	9.0	4.0	12.57	4	6.0
51	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	3.00	1.75	4.75	12.0	13.0	132.73	4	6.0
52	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	15.0	9.0	63.62	4	3.0
53	coast live oak	*Quercus agrifolia* var. *agrifolia*	4	2.00	1.00	3.00	11.0	8.0	50.27	4	3.0
54	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	12.0	11.0	95.03	4	3.0
55	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	13.0	10.0	78.54	4	2.0
56	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	7.0	5.0	19.64	4	3.0
57	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	13.0	10.0	78.54	4	1.0
58	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	13.0	11.0	95.03	4	3.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
59	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	3.0	3.0	7.07	4	3.0
60	Engelmann oak	*Quercus engelmannii*	1	1.50	–	1.50	13.0	7.0	38.48	4	2.0
61	No Plant										
62	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	9.0	6.0	28.27	4	5.0
63	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	13.0	8.0	50.27	4	6.0
64	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	18.0	10.0	78.54	4	3.0
65	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	19.0	10.0	78.54	4	3.0
66	No Plant										
67	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	16.0	7.0	38.48	4	2.0
68	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	7.0	7.0	38.48	4	4.0
69	No Plant										
70	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	9.0	7.0	38.48	3	1.0
71	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	6.0	3.0	7.07	3	0.0
72	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.50	1.50	7.0	4.0	12.57	4	2.0
73	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	10.0	11.0	95.03	3	1.0
74	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	16.0	11.0	95.03	4	2.0
75	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	16.0	9.0	63.62	4	5.0
76	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	13.0	12.0	113.10	4	2.0
77	coast live oak	*Quercus agrifolia* var. *agrifolia*	4	0.75	0.50	1.25	9.0	6.0	28.27	2	3.0
78	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	12.0	10.0	78.54	3	0.5
79	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	0.50	0.25	0.75	8.0	4.0	12.57	3	1.0
80	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	11.0	8.0	50.27	4	4.0
81	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	0.50	1.75	7.0	7.0	38.48	4	3.0
82	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	11.0	8.0	4.00	2	1.0
83	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	6.0	4.0	12.57	2	1.0
84	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	10.0	5.0	19.64	4	1.0
85	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	3.25	1.00	4.25	14.0	8.0	50.27	4	1.0
86	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	10.0	11.0	95.03	4	2.0
87	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	9.0	6.0	28.27	4	1.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
88	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	12.0	9.0	63.62	4	2.0
89	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	11.0	10.0	78.54	4	3.0
90	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.50	1.50	9.0	5.0	19.64	4	1.0
91	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	6.0	3.0	7.07	2	0.5
92	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	20.0	9.0	63.62	4	2.0
93	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	9.0	63.62	4	2.0
94	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	1.00	2.25	8.0	7.0	38.48	4	2.0
95	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	11.0	9.0	63.62	4	1.0
96	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	11.0	8.0	50.27	4	3.0
97	Engelmann oak	*Quercus engelmannii*	2	0.25	0.15	0.40	5.0	3.0	7.07	4	0.5
98	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	10.0	11.0	95.03	4	1.0
99	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	14.0	6.0	28.27	4	1.0
100	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	4.0	3.0	7.07	4	0.5
101	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.50	1.50	8.0	4.0	12.57	4	1.0
102	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	9.0	9.0	63.62	4	1.0
103	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	0.25	0.25	0.50	4.0	3.0	7.07	3	1.0
104	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	5.50	–	5.50	14.0	12.0	113.10	4	1.0
105	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	6.0	6.0	28.27	2	3.0
106	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	9.0	7.0	38.48	3	0.5
107	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	2.25	1.50	3.75	10.0	10.0	78.54	4	2.0
108	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	7.0	7.0	38.48	2	3.0
109	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	12.0	8.0	50.27	4	2.0
110	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.50	1.25	2.75	9.0	5.0	19.64	2	4.0
111	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.10	–	0.10	0.3	0.3	0.05	3	0.0
112	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	10.0	8.0	50.27	3	3.0
113	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	12.0	7.0	38.48	4	2.0
114	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	13.0	12.0	113.10	4	2.0
115	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	10.0	8.0	50.27	4	2.0
116	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	7.0	8.0	50.27	4	1.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
117	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	12.0	7.0	38.48	4	3.0
118	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	12.0	9.0	63.62	4	3.0
119	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	5.0	2.0	3.14	4	0.5
120	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	12.0	9.0	63.62	4	1.0
121	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	3.50	2.00	5.50	13.0	12.0	113.10	4	2.0
122	No Plant										
123	No Plant										
124	No Plant										
125	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	12.0	113.10	4	5.0
126	No Plant										
127	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.50	–	4.50	14.0	11.0	95.03	4	3.0
128	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.50	–	4.50	16.0	10.0	78.54	4	3.0
129	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	11.0	12.0	113.10	4	4.0
130	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.00	0.50	2.50	11.0	9.0	63.62	4	6.0
131	Engelmann oak	*Quercus engelmannii*	1	2.00	–	2.00	13.0	9.0	63.62	4	3.0
132	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	12.0	11.0	95.03	4	3.0
133	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	5.00	–	5.00	10.0	10.0	78.54	4	2.0
134	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	14.0	9.0	63.62	4	3.0
135	No Plant										
136	No Plant										
137	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	11.0	7.0	38.48	4	3.0
138	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	11.0	9.0	63.62	4	4.0
139	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	8.0	5.0	19.64	4	3.0
140	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	10.0	6.0	28.27	4	4.0
141	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	0.00	2.50	14.0	7.0	38.48	4	3.0
142	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.50	1.50	4.00	9.0	10.0	78.54	4	2.0
143	Engelmann oak	*Quercus engelmannii*	1	0.75	–	0.75	7.0	4.0	12.57	4	1.0
144	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	6.0	5.0	19.64	4	3.0
145	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.75	1.75	10.0	8.0	50.27	4	1.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
146	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	9.0	8.0	4.00	3	1.0
147	No Plant										
148	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	9.0	8.0	50.27	4	3.0
149	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	10.0	10.0	78.54	4	1.0
150	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	9.0	8.0	50.27	4	4.0
151	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	6.0	3.0	7.07	4	2.0
152	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	13.0	12.0	113.10	4	3.0
153	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	12.0	10.0	78.54	4	2.0
154	No Plant										
155	No Plant										
156	No Plant										
157	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	8.0	8.0	50.27	4	1.0
158	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	8.0	50.27	4	0.5
159	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	10.0	10.0	78.54	2	0.5
160	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	8.0	12.0	113.10	4	1.0
161	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	0.25	0.15	0.40	4.0	3.0	7.07	3	1.0
162	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	12.0	10.0	78.54	4	2.0
163	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	1.50	0.50	2.00	9.0	8.0	50.27	4	1.0
164	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	6.0	6.0	28.27	3	0.5
165	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	11.0	12.0	113.10	4	2.0
166	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	7.0	9.0	4.00	3	0.0
167	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	6.0	9.0	63.62	4	1.0
168	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	9.0	4.0	12.57	4	1.0
169	No Plant										
170	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	1.00	2.25	9.0	8.0	50.27	4	2.0
171	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	12.0	9.0	63.62	4	1.0
172	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.50	1.00	3.50	10.0	8.0	50.27	4	2.0
173	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	13.0	9.0	63.62	4	2.0
174	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	0.75	2.00	10.0	8.0	50.27	4	3.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
175	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	9.0	8.0	50.27	4	3.0
176	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	13.0	8.0	50.27	4	2.0
177	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	10.0	8.0	50.27	4	3.0
178	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	7.0	5.0	19.64	4	2.0
179	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	6.0	4.0	12.57	4	4.0
180	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	14.0	10.0	78.54	4	5.0
181	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	10.0	13.0	132.73	4	3.0
182	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	15.0	12.0	113.10	4	4.0
183	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	3.0	3.0	7.07	4	3.0
184	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	8.0	4.0	12.57	4	1.0
185	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	6.0	6.0	28.27	4	3.0
186	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	11.0	8.0	50.27	4	2.0
187	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	9.0	63.62	4	2.0
188	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	4.00	2.00	6.00	20.0	15.0	176.72	4	4.0
189	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	12.0	9.0	63.62	4	4.0
190	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	6.0	6.0	28.27	4	7.0
191	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	10.0	9.0	63.62	4	3.0
192	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	8.0	4.0	12.57	4	3.0
193	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	8.0	50.27	4	2.0
194	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.10	–	0.10	0.3	0.3	0.05	1	0.0
195	Engelmann oak	*Quercus engelmannii*	1	1.25	–	1.25	9.0	5.0	19.64	4	0.5
196	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	13.0	10.0	78.54	4	7.0
197	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	7.0	7.0	38.48	4	1.0
198	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	6.0	7.0	38.48	4	3.0
199	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	6.0	28.27	4	4.0
200	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	15.0	11.0	95.03	4	4.0
201	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	3.50	3.50	7.00	15.0	13.0	132.73	4	5.0
202	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.50	–	4.50	15.0	9.0	63.62	4	4.0
203	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	2.75	0.50	3.25	13.0	11.0	95.03	4	4.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
204	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	14.0	9.0	63.62	4	6.0
205	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.50	–	4.50	17.0	10.0	78.54	4	6.0
206	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	9.0	9.0	63.62	4	3.0
207	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.25	–	4.25	17.0	11.0	95.03	4	8.0
208	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	11.0	9.0	63.62	4	3.0
209	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.00	0.50	2.50	12.0	11.0	95.03	4	3.0
210	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	5.00	3.00	8.00	18.0	12.0	113.10	4	2.0
211	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	0.50	0.25	0.75	3.0	3.0	7.07	3	2.0
212	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	1.00	2.25	9.0	8.0	50.27	4	2.0
213	No Plant										
214	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.00	2.75	12.0	10.0	78.54	4	6.0
215	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	8.0	4.0	12.57	4	5.0
216	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	14.0	11.0	95.03	4	5.0
217	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	0.50	1.75	10.0	6.0	28.27	4	3.0
218	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.25	1.25	6.0	4.0	12.57	2	0.5
219	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	14.0	13.0	132.73	4	7.0
220	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	0.50	1.75	7.0	6.0	28.27	4	4.0
221	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	2.50	1.75	4.25	15.0	11.0	95.03	4	6.0
222	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.25	3.00	10.0	9.0	63.62	4	5.0
223	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	10.0	9.0	63.62	4	6.0
224	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	11.0	95.03	4	3.0
225	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	5.0	3.0	7.07	4	1.0
226	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	11.0	9.0	63.62	4	3.0
227	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	12.0	12.0	113.10	4	3.0
228	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.50	0.75	2.25	7.0	7.0	38.48	4	6.0
229	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	9.0	6.0	28.27	4	3.0
230	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	16.0	9.0	63.62	4	7.0
231	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	0.25	0.50	0.75	6.0	5.0	19.64	4	4.0
232	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	1.25	2.50	10.0	9.0	63.62	4	4.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
233	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.25	0.50	2.75	11.0	9.0	63.62	4	2.0
234	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	6.0	2.0	3.14	3	0.5
235	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	10.0	8.0	50.27	4	4.0
236	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	11.0	8.0	50.27	4	1.0
237	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	8.0	12.0	113.10	4	4.0
238	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.50	–	4.50	14.0	11.0	95.03	4	3.0
239	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	3.00	2.75	5.75	13.0	10.0	78.54	4	5.0
240	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.75	–	4.75	13.0	12.0	113.10	4	4.0
241	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	10.0	11.0	95.03	4	5.0
242	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	9.0	9.0	63.62	4	1.0
243	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	8.0	3.0	7.07	4	3.0
244	Engelmann oak	*Quercus engelmannii*	1	0.50	–	0.50	10.0	4.0	12.57	3	0.0
245	coast live oak	*Quercus agrifolia* var. *agrifolia*	5	0.75	0.50	1.25	8.0	10.0	78.54	3	4.0
246	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	2.00	0.50	2.50	10.0	9.0	63.62	4	4.0
247	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	7.0	3.0	7.07	4	5.0
248	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.50	3.25	11.0	9.0	63.62	4	2.0
249	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.50	0.75	2.25	10.0	8.0	50.27	4	3.0
250	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	9.0	63.62	4	4.0
251	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	7.0	5.0	19.64	4	3.0
252	No Plant										
253	No Plant										
254	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.00	2.75	12.0	10.0	78.54	4	6.0
255	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	8.0	4.0	12.57	4	5.0
256	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.25	–	3.25	14.0	11.0	95.03	4	5.0
257	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	0.50	1.75	10.0	6.0	28.27	4	3.0
258	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.25	1.25	6.0	4.0	12.57	2	0.5
259	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	14.0	13.0	132.73	4	7.0
260	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	0.50	1.75	7.0	6.0	28.27	4	4.0
261	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	2.50	1.75	4.25	15.0	11.0	95.03	4	6.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
262	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.25	3.00	10.0	9.0	63.62	4	5.0
263	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	10.0	9.0	63.62	4	6.0
264	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	11.0	95.03	4	3.0
265	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	5.0	3.0	7.07	4	1.0
266	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	11.0	9.0	63.62	4	3.0
267	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	12.0	12.0	113.10	4	3.0
268	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.50	0.75	2.25	7.0	7.0	38.48	4	6.0
269	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.50	–	1.50	9.0	6.0	28.27	4	3.0
270	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	16.0	9.0	63.62	4	7.0
271	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	0.25	0.50	0.75	6.0	5.0	19.64	4	4.0
272	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	1.25	2.50	10.0	9.0	63.62	4	4.0
273	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.25	0.50	2.75	11.0	9.0	63.62	4	2.0
274	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	6.0	2.0	3.14	3	0.5
275	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	10.0	8.0	50.27	4	4.0
276	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	11.0	8.0	50.27	4	1.0
277	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	8.0	12.0	113.10	4	4.0
278	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.50	–	4.50	14.0	11.0	95.03	4	3.0
279	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	3.00	2.75	5.75	13.0	10.0	78.54	4	5.0
280	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.75	–	4.75	13.0	12.0	113.10	4	4.0
281	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	10.0	11.0	95.03	4	5.0
282	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	9.0	9.0	63.62	4	1.0
283	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	8.0	3.0	7.07	4	3.0
284	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	10.0	4.0	12.57	3	0.0
285	coast live oak	*Quercus agrifolia* var. *agrifolia*	5	0.75	0.50	1.25	8.0	10.0	78.54	3	4.0
286	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	2.00	0.50	2.50	10.0	9.0	63.62	4	4.0
287	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	7.0	3.0	7.07	4	5.0
288	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.50	3.25	11.0	9.0	63.62	4	2.0
289	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.50	0.75	2.25	10.0	8.0	50.27	4	3.0
290	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	9.0	63.62	4	4.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
291	Engelmann oak	*Quercus engelmannii*	1	0.75	–	0.75	7.0	5.0	19.64	4	3.0
292	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.75	1.00	2.75	12.0	10.0	78.54	4	6.0
293	No Plant										
294	No Plant										
295	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	18.0	12.0	113.10	4	4.0
296	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	13.0	12.0	113.10	4	4.0
297	San Gabriel oak	*Quercus durata* var. *gabrielensis*	3	0.25	0.15	0.40	3.0	3.0	7.07	2	1.0
298	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	11.0	9.0	63.62	4	5.0
299	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.75	2.75	5.50	13.0	14.0	153.94	4	5.0
300	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	11.0	9.0	63.62	4	3.0
301	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	3.50	0.25	3.75	12.0	13.0	132.73	4	4.0
302	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	16.0	12.0	113.10	4	5.0
303	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	12.0	6.0	28.27	4	4.0
304	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.00	2.00	4.00	12.0	11.0	95.03	4	5.0
305	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	4.0	3.0	7.07	4	2.0
306	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	16.0	12.0	113.10	4	7.0
307	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	14.0	11.0	95.03	4	2.0
308	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.50	1.00	3.50	14.0	8.0	50.27	4	3.0
309	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	12.0	8.0	50.27	4	4.0
310	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	13.0	6.0	28.27	4	2.0
311	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.25	2.25	4.50	12.0	8.0	50.27	4	3.0
312	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	9.0	63.62	4	5.0
313	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.15	–	0.15	0.6	0.3	0.05	4	0.0
314	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.25	0.75	3.00	13.0	8.0	50.27	4	5.0
315	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.25	–	1.25	9.0	5.0	19.64	4	1.0
316	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	1.25	0.50	1.75	8.0	7.0	38.48	4	2.0
317	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.00	1.00	3.00	10.0	7.0	38.48	4	3.0
318	Engelmann oak	*Quercus engelmannii*	1	0.15	–	0.15	0.3	0.3	0.05	4	0.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
319	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	14.0	9.0	63.62	4	2.0
320	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.25	–	4.25	15.0	10.0	78.54	4	5.0
321	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	11.0	9.0	63.62	4	3.0
322	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	12.0	10.0	4.00	3	0.0
323	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	12.0	11.0	95.03	4	6.0
324	No Plant										
325	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	14.0	8.0	50.27	4	1.0
326	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.00	0.50	2.50	10.0	7.0	38.48	4	1.0
327	Engelmann oak	*Quercus engelmannii*	1	1.00	–	1.00	10.0	6.0	28.27	4	2.0
328	No Plant										
329	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	0.75	0.50	1.25	6.0	7.0	38.48	4	2.0
330	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	13.0	11.0	95.03	4	5.0
331	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.75	–	4.75	14.0	12.0	113.10	4	3.0
332	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.15	–	0.15	3.0	2.0	3.14	4	2.0
333	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	11.0	9.0	63.62	4	5.0
334	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	16.0	9.0	63.62	4	2.0
335	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	12.0	11.0	4.00	4	0.0
336	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	11.0	9.0	63.62	4	4.0
337	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	9.0	4.0	12.57	4	4.0
338	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	14.0	11.0	95.03	4	5.0
339	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	12.0	7.0	38.48	4	1.0
340	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.00	–	3.00	13.0	10.0	78.54	4	2.0
341	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	11.0	5.0	19.64	4	2.0
342	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	11.0	8.0	50.27	4	3.0
343	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.75	–	3.75	14.0	11.0	95.03	4	3.0
344	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	8.0	6.0	28.27	4	3.0
345	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.50	–	2.50	13.0	8.0	50.27	4	2.0
346	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.00	0.50	1.50	6.0	6.0	28.27	4	3.0
347	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	6.00	–	6.00	17.0	12.0	113.10	4	3.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
348	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	4.0	2.0	3.14	4	2.0
349	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	4.00	–	4.00	16.0	12.0	113.10	4	4.0
350	Engelmann oak	*Quercus engelmannii*	2	0.15	0.15	0.30	2.0	1.0	0.79	4	0.0
351	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	5.00	–	5.00	16.0	14.0	153.94	4	7.0
352	Engelmann oak	*Quercus engelmannii*	5	0.15	0.15	0.30	2.0	1.0	0.79	4.00	0.0
353	Engelmann oak	*Quercus engelmannii*	1	1.25	–	1.25	7.0	8.0	50.27	4	2.0
354	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	3.0	2.0	3.14	4	2.0
355	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.25	1.00	3.25	7.0	9.0	63.62	4	2.0
356	Engelmann oak	*Quercus engelmannii*	2	1.00	1.00	2.00	9.0	5.0	19.64	4	2.0
357	coast live oak	*Quercus agrifolia* var. *agrifolia*	4	1.75	1.75	3.50	11.0	11.0	95.03	4	2.0
358	coast live oak	*Quercus agrifolia* var. *agrifolia*	3	1.50	0.50	2.00	9.0	6.0	28.27	2	0.0
359	Engelmann oak	*Quercus engelmannii*	1	0.10	0.50	0.60	0.3	0.3	0.05	4	0.0
360	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	3.0	2.0	3.14	4	1.0
361	No Plant										
362	No Plant										
363	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.10	–	0.10	0.3	0.3	0.05	4	0.0
364	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.15	–	0.15	2.0	2.0	3.14	4	1.0
365	No Plant										
366	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.15	–	0.15	2.0	0.5	0.25	4	4.0
367	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.15	–	0.15	0.5	0.3	0.05	4	0.0
368	No Plant										
369	No Plant										
370	Engelmann oak	*Quercus engelmannii*	2	0.50	0.50	1.00	7.0	3.0	7.07	4	1.0
371	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	8.0	3.0	7.07	3	0.5
372	Engelmann oak	*Quercus engelmannii*	1	0.15	0.50	0.65	0.3	0.3	0.05	4	0.0
373	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.15	–	0.15	1.0	0.8	0.44	4	0.0
374	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	13.0	9.0	63.62	4	3.0
375	San Gabriel oak	*Quercus durata* var. *gabrielensis*	1	0.15	–	0.15	2.0	1.0	0.79	4	1.0
376	No Plant										

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
377	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.75	–	2.75	11.0	12.0	113.10	4	2.0
378	No Plant										
379	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	6.0	4.0	12.57	2	0.0
380	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	9.0	6.0	28.27	3	1.0
381	No Plant										
382	No Plant										
383	No Plant										
384	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	3.50	–	3.50	12.0	8.0	50.27	4	3.0
385	Engelmann oak	*Quercus engelmannii*	1	0.25	–	0.25	7.0	2.0	3.14	4	4.0
386	No Plant										
387	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	0.25	0.25	0.50	5.0	4.0	12.57	3	0.5
388	No Plant										
389	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	1.25	1.00	2.25	12.0	10.0	78.54	4	1.0
390	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	2.25	1.75	4.00	14.0	9.0	63.62	4	2.0
391	No Plant										
392	No Plant										
393	No Plant										
394	No Plant										
395	No Plant										
396	Engelmann oak	*Quercus engelmannii*	1	0.15	–	0.15	1.5	1.0	0.79	2	0.0
397	No Plant										
398	coast live oak	*Quercus agrifolia* var. *agrifolia*	2	0.25	0.15	0.40	4.0	2.0	3.14	2	0.0
399	No Plant										
400	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	6.0	6.0	4.00	3	0.0
401	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	3.0	3.0	7.07	4	3.0
402	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	4.0	3.0	7.07	4	4.0
403	No Plant										
404	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.25	–	0.25	4.0	3.0	7.07	4	7.0
405	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.25	–	2.25	9.0	8.0	50.27	4	5.0

TABLE E-1
OAK TREE EVALUATION DATA – YEAR SEVEN (2022)

Tree No.	Tree Species		No. Main Trunks	Diameter (inches)			Height (feet)	Canopy Diameter (feet)	Canopy Area (square feet)	Health Rating	Average Shoot Elongation (inches)
	Common Name	Scientific Name		1st Trunk	2nd Trunk	Sum of Two Trunks					
406[a]	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	16.00	–	16.00	25.0	25.0	490.88	4	3.0
407[a]	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	14.00	–	14.00	25.0	15.0	176.72	3	1.0
408[a]	coast live oak	*Quercus agrifolia* var. *agrifolia*	4	8.00	7.00	15.00	25.0	25.0	490.88	4	2.0
409[a]	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	19.00	–	19.00	25.0	30.0	706.86	4	2.0
410	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.00	–	1.00	8.0	6.0	28.27	4	5.0
411	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.75	–	0.75	8.0	5.0	19.64	4	4.0
412	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	4.0	4.0	12.57	4	2.0
413	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	1.75	–	1.75	8.0	7.0	38.48	4	4.0
414	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	0.50	–	0.50	6.0	4.0	12.57	4	8.0
415	coast live oak	*Quercus agrifolia* var. *agrifolia*	1	2.00	–	2.00	10.0	9.0	63.62	4	8.0
Total: All oaks									**21,118.08**		
Total: Planted oaks (tree and shrub species)[b]									**19,268.45**		
Total: Planted oak tree species[b]									**19,252.76**		
Average: Planted oak tree species[b]						**2.38**	**10.10**	**7.70**		**3.81**	

[a] Pre-existing mature oak
[b] Excludes *Quercus durata* var. *gabrielensis* (a shrub species) and pre-existing mature oaks (nos. 406 through 409).

ATTACHMENT F

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013 TO AUGUST 2022)

ATTACHMENT F
NATIVE PLANT COMPENDIUM (SEPTEMBER 2013 – AUGUST 2022)

Species (151 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
LYCOPHYTES			
SELAGINELLACEAE–SPIKE-MOSS FAMILY			
Selaginella bigelovii	Bigelow's spike-moss		
FERNS			
DRYOPTERIDACEAE–WOOD FERN FAMILY			
Dryopteris arguta	sharp-toothed wood fern		
POLYPODIACEAE–POLYPODY FAMILY			
Polypodium californicum	California polypody		
PTERIDACEAE–BRAKE FAMILY			
Aspidotis californica	California lace fern		
Pellaea andromedifolia	coffee fern		
Pellaea mucronata var. *mucronata*	Bird's-foot fern		
Pentagramma triangularis	goldback fern		
CERATOPHYLLALES			
CERATOPHYLLACEAE–HORNWORT FAMILY			
Ceratophyllum demersum	submerged hornwort		OBL
EUDICOTS			
ADOXACEAE–MUSKROOT FAMILY			
Sambucus nigra ssp. *caerulea*	blue elderberry		FAC
ANACARDIACEAE–SUMAC FAMILY			
Malosma laurina	laurel sumac		
Rhus aromatica	skunk bush		FACU
Rhus ovata	sugar bush		
Toxicodendron diversilobum	western poison oak		FACU
APOCYNACEAE–DOGBANE FAMILY			
Asclepias eriocarpa	kotolo		
ASTERACEAE–SUNFLOWER FAMILY			
Acourtia microcephala	small-headed acourtia		
Ambrosia acanthicarpa	annual bur-sage		
Ambrosia psilostachya	western ragweed		FACU
Artemisia californica	California sagebrush		
Artemisia douglasiana	mugwort		FAC
Baccharis pilularis ssp. *consanguinea*	coyote brush		
Baccharis salicifolia ssp. *salicifolia*	mule fat		FAC
Brickellia californica	California brickellbush		FACU
Chaenactis glabriuscula var. *glabriuscula*	yellow pincushion		
Cirsium occidentale	cobwebby thistle		
Corethrogyne filaginifolia	filago-leaved sand-aster		
Deinandra fasciculata	fascicled tarplant		FACU
Encelia californica	California encelia		
Ericameria nauseosa	rubber rabbitbrush		
Ericameria parishii var. *parishii*	Parish's goldenbush		
Erigeron canadensis	horseweed		FACU
Eriophyllum confertiflorum var. *confertiflorum*	golden-yarrow		

ATTACHMENT F
NATIVE PLANT COMPENDIUM (SEPTEMBER 2013 – AUGUST 2022)

Species (151 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
Hazardia squarrosa var. *grindelioides*	grindelia-like saw-toothed goldenbush		
Helianthus annuus	annual sunflower		FACU
Heterotheca grandiflora	telegraph weed		
Heterotheca sessiliflora ssp. *fastigiata*	upright sessileflower goldenaster		
Lasthenia gracilis	common goldfields		
Lepidospartum squamatum	scaly scale-broom		FACU
Logfia filaginoides	California cottonrose		
Malacothrix saxatilis	rocky malacothrix		
Pseudognaphalium biolettii	Bioletti's cudweed		
Pseudognaphalium californicum	California cudweed		
Pseudognaphalium canescens	hairy cudweed		FACU
Pseudognaphalium stramineum	straw-colored cudweed		FAC
Senecio flaccidus var. *douglasii*	Douglas' threadleaf ragwort		
Stephanomeria virgata	wand-like stephanomeria		
BORAGINACEAE–BORAGE FAMILY			
Cryptantha intermedia var. *intermedia*	intermediate cryptantha		
Eriodictyon crassifolium	thick-leaved yerba santa		
Eriodictyon parryi	poodle-dog bush		
Eucrypta chrysanthemifolia var. *chrysanthemifolia*	chrysanthemum-leaved eucrypta		
Phacelia cicutaria	cicuta-leaved phacelia		
Phacelia distans	distant phacelia		OBL
Phacelia grandiflora	large-flowered phacelia		
Phacelia minor	wild Canterbury bells		
Phacelia ramosissima	branching phacelia		FACU
BRASSICACEAE–MUSTARD FAMILY			
Cardamine oligosperma	few-flowered bitter-cress		FAC
CACTACEAE–CACTUS FAMILY			
Opuntia vaseyi	Vasey's prickly-pear		
Opuntia littoralis	seaside prickly pear		
CAPRIFOLIACEAE–HONEYSUCKLE FAMILY			
Lonicera subspicata var. *denudata*	naked partially-spiked honeysuckle		
CARYOPHYLLACEAE–PINK FAMILY			
Silene laciniata	torn catchfly		
CONVOLVULACEAE–MORNING-GLORY FAMILY			
Calystegia macrostegia	large-bracted morning-glory		
Cuscuta sp.	dodder		
CRASSULACEAE–STONECROP FAMILY			
Dudleya lanceolata	lance-leaved dudleya		
CUCURBITACEAE–GOURD FAMILY			
Marah macrocarpa	chilicothe		
EUPHORBIACEAE–SPURGE FAMILY			
Euphorbia polycarpa	smallseed sandmat		
FABACEAE–LEGUME FAMILY			
Acmispon brachycarpus	short fruit deervetch		

ATTACHMENT F
NATIVE PLANT COMPENDIUM (SEPTEMBER 2013 – AUGUST 2022)

Species (151 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
Acmispon glaber var. *glaber*	glabrous deerweed		
Acmispon maritimus var. *maritimus*	coastal deervetch		
Acmispon strigosus	strigose deervetch		
Lupinus concinnus	bajada lupine		
Lupinus hirsutissimus	stinging lupine		
Lupinus longifolius	long-leaved lupine		
Lupinus succulentus	arroyo lupine		
Lupinus truncates	cut leaf lupine		
FAGACEAE–OAK FAMILY			
Quercus agrifolia var. *agrifolia*	coast live oak		
Quercus chrysolepis	canyon live oak		
Quercus durata var. *gabrielensis*	San Gabriel oak	CRPR 4.2	
Quercus engelmannii	Engelmann oak	CRPR 4.2	
GROSSULARIACEAE–GOOSEBERRY FAMILY			
Ribes aureum var. *gracillimum*	graceful golden currant		FAC
Ribes californicum var. *hesperium*	hillside gooseberry		
Ribes malvaceum var. *viridifolium*	leaf-shaped currant		
LAMIACEAE–MINT FAMILY			
Salvia apiana	white sage		
Salvia columbariae	chia		
Salvia mellifera	black sage		
Stachys bullata	puckered hedge-nettle		
LOASACEAE–BLAZING STAR FAMILY			
Mentzelia laevicaulis	smooth-stemmed blazing star		
LYTHRACEAE–LOOSESTRIFE FAMILY			
Ammannia coccinea	scarlet ammania		OBL
NYCTAGINACEAE–FOUR O'CLOCK FAMILY			
Mirabilis laevis var. *crassifolia*	wishbone bush		
ONAGRACEAE–EVENING PRIMROSE FAMILY			
Camissoniopsis hirtella	pubescent camissoniopsis		
Clarkia dudleyana	Dudley's clarkia		
Clarkia purpurea ssp. *quadrivulnera*	four-spot		
Epilobium brachycarpum	short-fruited willowherb		
Epilobium canum ssp. *canum*	California fuchsia		
Epilobium ciliatum ssp. *ciliatum*	fringed willowherb		FACW
Eulobus californicus	California eulobus		
Oenothera elata ssp. *hirsutissima*	hairy tall evening primrose		FACW
OXALIDACEAE–OXALIS FAMILY			
Oxalis californica	California wood-sorrel		
PAPAVERACEAE–POPPY FAMILY			
Eschscholzia californica	California poppy		
PHRYMACEAE–LOPSEED FAMILY			
Diplacus aurantiacus	orange bush monkeyflower		FACU
Erythranthe cardinalis	scarlet monkeyflower		FACW

ATTACHMENT F
NATIVE PLANT COMPENDIUM (SEPTEMBER 2013 – AUGUST 2022)

Species (151 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
Erythranthe guttata	common monkeyflower		OBL
Mimetanthe pilosa	downy monkeyflower		
PLANTAGINACEAE–PLANTAIN FAMILY			
Keckiella cordifolia	heart-leaved bush penstemon		
Penstemon heterophyllus var. *australis*	southern bunch leaf beardtongue		
Penstemon spectabilis var. *spectabilis*	spectacular beardtongue		
Penstemon spectabilis var. *subviscosus*	glandular spectacular beardtongue		
PLATANACEAE–SYCAMORE FAMILY			
Platanus racemosa	western sycamore		FAC
POLEMONIACEAE–PHLOX FAMILY			
Linanthus californicus	prickly phlox		
POLYGONACEAE–BUCKWHEAT FAMILY			
Eriogonum elongatum var. *elongatum*	long-stem wild buckwheat		
Eriogonum fasciculatum var. *foliolosum*	leafy California buckwheat		
Persicaria lapathifolia	willow weed		FACW
RANUNCULACEAE–BUTTERCUP FAMILY			
Clematis lasiantha	chaparral clematis		
Delphinium cardinale	cardinal larkspur		
RHAMNACEAE–BUCKTHORN FAMILY			
Ceanothus crassifolius	hoaryleaf ceanothus		
Ceanothus leucodermis	chaparral whitethorn		
Ceanothus oliganthus	few-flowered California-lilac		
Frangula californica ssp. *californica*	California coffee berry		
Rhamnus crocea	spiny redberry		
Rhamnus ilicifolia	hollyleaf redberry		
ROSACEAE–ROSE FAMILY			
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain-mahogany		
Heteromeles arbutifolia	toyon		
Prunus ilicifolia ssp. *ilicifolia*	holly-leaved cherry		
Rosa californica	California rose		FAC
Rubus ursinus	California blackberry		FAC
RUBIACEAE–COFFEE FAMILY			
Galium angustifolium ssp. *angustifolium*	narrow-leaved bedstraw		
Galium aparine	goose grass		FACU
Galium nuttallii ssp. *nuttallii*	Nuttall's bedstraw		
SALICACEAE–WILLOW FAMILY			
Populus fremontii ssp. *fremontii*	Fremont cottonwood		FAC
Salix exigua var. *hindsiana*	Hinds' willow		FACW
Salix gooddingii	Goodding's black willow		FACW
Salix laevigata	red willow		FACW
Salix lasiolepis	arroyo willow		FACW
SOLANACEAE–NIGHTSHADE FAMILY			
Datura wrightii	Wright's jimsonweed		
Solanum americanum	American nightshade		FACU

ATTACHMENT F
NATIVE PLANT COMPENDIUM (SEPTEMBER 2013 – AUGUST 2022)

Species (151 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
Solanum douglasii	Douglas' nightshade		FAC
Solanum xanti	Xantus' nightshade		
URTICACEAE–NETTLE FAMILY			
Urtica dioica ssp. *holosericea*	hoary nettle		FAC
VERBENACEAE–VERVAIN FAMILY			
Verbena lasiostachys	woolly-flowered vervain		FAC
MONOCOTS			
AGAVACEAE–AGAVE FAMILY			
Hesperoyucca whipplei	Whipple's chaparral yucca		
CYPERACEAE–SEDGE FAMILY			
Cyperus eragrostis	lovegrass flatsedge		FACW
JUNCACEAE–RUSH FAMILY			
Juncus rugulosus	wrinkled rush		OBL
Juncus textilis	basket rush		FACW
Juncus xiphioides	iris-leaved rush		OBL
POACEAE–GRASS FAMILY			
Bromus arizonicus	Arizona brome		
Elymus condensatus	giant wild-rye		FACU
Eragrostis mexicana ssp. *virescens*	Chilean love grass		FACU
Festuca microstachys	small fescue		
Leptochloa fusca	sprangletop		
Melica imperfecta	little California melica		
Setaria parviflora	knotroot bristlegrass		FAC
Stipa coronata	crested needle grass		
Stipa lepida	foothill needle grass		
TYPHACEAE–CATTAIL FAMILY			
Typha domingensis	southern cattail		OBL

CRPR: California Rare Plant Rank

LEGEND:

* = Non-native species

CRPR – California Rare Plant Rank

4. Plants of limited distribution - a watch list

Threat Code Extensions

.2 Moderately threatened in California (20–80% of occurrences threatened/moderate degree and immediacy of threat)

Wetlands Designations (National Wetland Plant List [NWPL]: U. S. Army Corps of Engineers 2016):

FACU Plants that are not wetland dependent. They are non-wetland plants by habitat preference.
FAC These plants can occur in wetlands or non-wetlands. They can grow in hydric, mesic, or xeric habitats.
FACW Plants dependent on and that predominantly occur with hydric soils, standing water, or seasonally high water tables in wet habitats
OBL Wetland-dependent plants that require standing water or seasonally saturated soils near the surface.

ATTACHMENT G

VERTEBRATE WILDLIFE COMPENDIA (SEPTEMBER 2013 TO DECEMBER 2022)

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
AMPHIBIANS													
***AMPHIBIA*–AMPHIBIANS**													
HYLIDAE–TREEFROGS													
Pseudacris hypochondriaca	Baja California treefrog				X	X	X	X	X	X	X	X	X
Subtotal: Native Amphibian Species			**0**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
***LEPIDOSAURIA*–LIZARDS AND SNAKES**													
PHRYNOSOMATIDAE–SPINY LIZARDS													
Sceloporus occidentalis	western fence lizard		X	X	X	X	X	X	X	X	X	X	X
Uta stansburiana	common side-blotched lizard		X	X	X	X	X	X	X	X	X	X	X
TEIIDAE–WHIPTAIL LIZARDS													
Aspidoscelis tigris stejnegeri	San Diegan tiger whiptail	SSC[b]	X	X	X	X	X	X		X	X	X	X
ANGUIDAE–ALLIGATOR LIZARDS													
Elgaria multicarinata	southern alligator lizard							X				X	X
COLUBRIDAE–COLUBRID SNAKES													
Coluber taeniatus	striped whipsnake			X	X	X					X	X	X
Coluber flagellum piceus	red racer					X							X
Pituophis catenifer	gophersnake					X							X
VIPERIDAE–VIPERS AND PITVIPERS													
Crotalus oreganus helleri	southern Pacific rattlesnake				X	X		X					X
Subtotal: Native Reptile Species			**3**	**4**	**5**	**7**	**3**	**5**	**2**	**3**	**4**	**5**	**8**
BIRDS													
***AVES*–BIRDS**													
ANATIDAE–SWAN, GOOSE, AND DUCK FAMILY													
Branta canadensis	Canada goose				X		X		X	X			X
ODONTOPHORIDAE–NEW WORLD QUAIL FAMILY													
Callipepla californica	California quail			X	X	X	X	X	X	X	X	X	X
COLUMBIDAE–PIGEONS AND DOVES													
Patagoienas fasciata	band-tailed pigeon				X	X	X	X	X	X	X	X	X
Zenaida macroura	mourning dove		X	X	X	X	X	X[a]	X[a]	X	X	X	X[a]

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
CAPRIMULGIDAE–NIGHTJARS													
Phalaenoptilus nuttallii	common poorwill										X		X
APODIDAE–SWIFTS													
Aeronautes saxatalis	white-throated swift			X	X	X	X	X	X	X		X	X
TROCHILIDAE–HUMMINGBIRDS													
Archilochus alexandri	black-chinned hummingbird				X		X		X				X
Calypte anna	Anna's hummingbird		X	X	X	X	X	X	X	X	X	X	X
Calypte costae	Costa's hummingbird				X		X		X	X		X	X
Selasphorus rufus	rufous hummingbird				X	X			X	X		X	X
Selasphorus sasin	Allen's hummingbird		X	X	X	X	X	X	X	X	X	X	X
Selasphorus sp.	Allen's/rufous hummingbird			X	X	X	X	X	X	X	X	X	X
CHARADRIIDAE–PLOVERS													
Charadrius vociferus	killdeer		X	X[a]	X	X		X					X[a]
ARDEIDAE–HERONS													
Ardea herodias	great blue heron				X		X			X			X
CATHARTIDAE–NEW WORLD VULTURES													
Cathartes aura	turkey vulture			X	X	X	X	X	X	X	X	X	X
PANIONIDAE–OSPREY													
Pandion haliaetus	osprey							X					X
ACCIPITRIDAE–HAWKS, KITES, EAGLES, AND ALLIES													
Accipiter cooperii	Cooper's hawk	WL	X	X	X	X	X	X	X	X	X	X	X
Buteo jamaicensis	red-tailed hawk		X	X	X	X	X	X	X	X	X	X	X
STRIGIDAE–TYPICAL OWLS													
Bubo virginianus	great horned owl										X	X	X
PICIDAE–WOODPECKERS													
Melanerpes lewis	Lewis' woodpecker		X	X									X
Melanerpes formicivorus	acorn woodpecker			X[a]	X[a]	X[a]	X[a]	X[a]	X	X[a]	X	X	X[a]
Picoides nuttallii	Nuttall's woodpecker				X	X		X	X	X	X	X	X
Picoides pubescens	downy woodpecker				X								X
Colaptes auratus	northern flicker (red-shafted)			X	X	X	X	X	X	X	X	X	X

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
Colaptes auratus	northern flicker (yellow-shafted)											X	X
FALCONIDAE–FALCONS													
Falco sparverius	American kestrel			X	X	X	X	X	X	X			X
Falco columbarius	merlin			X				X					X
Falco peregrinus anatum	American peregrine falcon	FP										X	X
TYRANNIDAE–TYRANT FLYCATCHERS													
Contopus sordidulus	western wood-pewee				X								X
Empidonax traillii	willow flycatcher				X								X
Empidonax difficilis	Pacific-slope flycatcher				X		X			X		X	X
Empidonax oberholseri	dusky flycatcher										X		X
Sayornis nigricans	black phoebe		X	X	X	X	X	X	X	X	X	X	X
Sayornis saya	Say's phoebe			X	X		X	X					X
Myiarchus cinerascens	ash-throated flycatcher			X	X	X	X	X	X[a]	X		X	X[a]
Tyrannus vociferans	Cassin's kingbird			X	X	X	X	X	X	X[a]	X	X	X[a]
Tyrannus verticalis	western kingbird			X	X								X
VIREONIDAE–VIREOS													
Vireo huttoni	Hutton's vireo									X			X
Vireo gilvus	warbling vireo				X			X					X
CORVIDAE–JAYS AND CROWS													
Aphelocoma californica	California scrub-jay		X	X	X	X	X	X	X	X	X	X	X
Corvus brachyrhynchos	American crow				X		X		X	X	X	X	X
Corvus corax	common raven		X	X	X	X	X	X	X	X	X	X	X
HIRUNDINIDAE–SWALLOWS													
Tachycineta bicolor	tree swallow						X						X
Stelgidopteryx serripennis	northern rough-winged swallow			X	X	X	X		X	X	X	X	X
Hirundo rustica	barn swallow				X	X		X	X	X			X
PARIDAE–TITS													
Baeolophus inornatus	oak titmouse							X	X	X	X	X	X
Poecile gambeli	mountain chickadee											X	X

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
AEGITHALIDAE–BUSHTITS													
Psaltriparus minimus	bushtit		X	X	X	X[a]	X[a]	X	X	X	X	X[a]	X[a]
TROGLODYTIDAE–WRENS													
Salpinctes obsoletus	rock wren			X	X	X	X	X	X				X
Catherpes mexicanus	canyon wren			X									X
Troglodytes aedon	house wren		X	X	X	X	X[a]	X	X	X	X	X	X[a]
Thryomanes bewickii	Bewick's wren		X	X	X	X	X[a]	X[a]	X[a]	X	X	X[a]	X[a]
POLIOPTILIDAE–GNATCATCHERS													
Polioptila caerulea	blue-gray gnatcatcher			X			X	X	X[a]	X	X	X	X[a]
REGULIDAE–KINGLETS													
Regulus calendula	ruby-crowned kinglet			X	X		X		X	X	X	X	X
SYLVIIDAE–SYLVIID WARBLERS													
Chamaea fasciata	wrentit			X	X	X	X	X	X	X	X	X	X
TURDIDAE–THRUSHES													
Sialia mexicana	western bluebird			X	X	X	X	X	X	X	X	X	X
Catharus guttatus	hermit thrush				X	X	X		X	X	X		X
Turdus migratorius	American robin			X	X	X	X	X	X	X		X	X
MIMIDAE–MOCKINGBIRDS AND THRASHERS													
Toxostoma redivivum	California thrasher					X	X	X	X[a]	X	X	X[a]	X[a]
Mimus polyglottos	northern mockingbird		X	X	X	X	X[a]	X[a]	X[a]	X	X	X[a]	X[a]
BOMBYCILLIDAE–WAXWINGS													
Bombycilla cedrorum	cedar waxwing				X	X	X		X				X
PTILOGONATIDAE–SILKY-FLYCATCHERS													
Phainopepla nitens	phainopepla			X		X	X	X	X[a]	X	X[a]	X	X[a]
SITTIDAE – NUTHATCH FAMILY													
Sitta carolinensis	white-breasted nuthatch											X	X
MOTACILLIDAE–PIPITS													
Anthus rubescens	American pipit		X								X		X

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
PARULIDAE–WOOD-WARBLERS													
Leiothlypis celata	orange-crowned warbler				X	X	X	X	X	X	X	X	X
Leiothlypis ruficapilla	Nashville warbler					X							X
Geothlypis tolmiei	MacGillivray's warbler				X								X
Geothlypis trichas	common yellowthroat		X	X[a]			X		X		X		X[a]
Setophaga petechia	yellow warbler				X								X
Setophaga coronata	yellow-rumped warbler		X	X	X	X	X	X	X	X	X	X	X
Setophaga townsendi	Townsend's warbler								X			X	X
Setophaga occidentalis	hermit warbler				X								X
Cardellina pusilla	Wilson's warbler				X	X	X	X	X		X		X
EMBERIZIDAE–SPARROWS													
Pipilo maculatus	spotted towhee		X	X	X	X	X	X	X	X	X	X	X
Aimophila ruficeps canescens	rufous-crowned sparrow	WL[b]		X		X	X	X[a]	X[a]	X	X	X[a]	X[a]
Melozone crissalis	California towhee		X	X	X	X[a]	X[a]	X[a]	X[a]	X	X	X[a]	X[a]
Chondestes grammacus	lark sparrow				X	X							X
Passerella iliaca	fox sparrow								X				X
Melospiza melodia	song sparrow		X	X	X	X	X	X	X	X	X	X	X
Melospiza lincolnii	Lincoln's sparrow			X		X	X		X		X		X
Zonotrichia leucophrys	white-crowned sparrow		X	X	X	X	X	X	X	X	X	X	X
Zonotrichia atricapilla	golden-crowned sparrow					X	X		X	X		X	X
Junco hyemalis	dark-eyed junco				X	X	X	X	X	X	X	X	X
CARDINALIDAE–CARDINALS, GROSBEAKS, AND ALLIES													
Piranga ludoviciana	western tanager				X								X
Pheucticus melanocephalus	black-headed grosbeak			X			X	X					X
Passerina caerulea	blue grosbeak				X								X
Passerina amoena	lazuli bunting				X		X	X			X		X

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
ICTERIDAE–BLACKBIRDS													
Sturnella neglecta	western meadowlark			X				X					X
Molothrus ater	brown-headed cowbird				X		X	X				X	X
Icterus cucullatus	hooded oriole			X	X	X	X	X	X	X	X	X	X
Icterus bullockii	Bullock's oriole			X	X	X	X					X	X
Haemorhous mexicanus	house finch		X	X	X	X	X	X	X	X	X	X	X
Haemorhous purpureus	purple finch										X		X
Spinus pinus	pine siskin				X						X		X
Spinus psaltria	lesser goldfinch		X	X	X	X	X	X	X	X	X	X	X
Spinus lawrencei	Lawrence's goldfinch				X						X		X
Spinus tristis	American goldfinch			X	X		X				X		X
Subtotal: Native Bird Species			**23**	**49**	**68**	**51**	**60**	**54**	**60**	**53**	**52**	**52**	**95**
MAMMALS													
***MAMMALIA*–MAMMALS**													
SCIURIDAE–SQUIRRELS													
Otospermophilus beecheyi	California ground squirrel			X	X	X	X	X	X	X	X	X	X
Neotamias merriami	Merriam's chipmunk						X		X	X			X
CRICETIDAE–NEW WORLD RATS AND MICE													
Neotoma bryanti intermedia	woodrat	SSC[c]									X	X	X
FELIDAE–CAT FAMILY													
Lynx rufus	bobcat						X	X	X		X		X
Puma concolor	mountain lion							X	X	X	X		X
CANIDAE–DOGS, WOLVES, AND FOXES													
Canis latrans	coyote				X	X	X	X	X	X	X	X	X
Urocyon cinereoargenteus	common gray fox					X	X	X	X	X	X	X	X
URSIDAE–BEARS													
Ursus americanus[d]	black bear		X		X		X	X	X	X	X	X	X
MEPHITIDAE–SKUNKS													
Mephitis mephitis	striped skunk					X	X	X	X	X			X

TABLE G-1
NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates): 115 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
PROCYONIDAE–PROCYONIDS													
Procyon lotor	northern raccoon						X		X				X
CERVIDAE–DEER													
Odocoileus hemionus	southern mule deer		X	X	X	X	X	X	X	X	X	X	X
Subtotal: Native Mammal Species			**2**	**2**	**4**	**5**	**9**	**8**	**10**	**8**	**8**	**6**	**11**
Total: Native Vertebrate Species			***28***	***55***	***78***	***64***	***73***	***68***	***73***	***65***	***65***	***63***	***115***

X: Observed species

[a] Bird species observed nesting on the site (15 species as of December 2022)
[b] Watch List (State of California)
[c] California State Species of Special Concern
[d] Although native to the State of California, black bear (*Ursus americanus*) was introduced to the San Gabriel Mountains (SGM) by the California Department of Fish and Wildlife in 1933 following the local (SGM) extirpation of the now-extinct California subspecies of the grizzly bear (*Ursos arctos californicus*) in 1894.

TABLE G-2
NON-NATIVE VERTEBRATE WILDLIFE COMPENDIUM (SEPTEMBER 2013 TO DECEMBER 2022)

Species (Vertebrates)		2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Cumulative
***AVES*–BIRDS**												
COLUMBIDAE–PIGEONS AND DOVES												
Columba livia	rock pigeon						X	X	X	X		X
Streptopelia decaocto	Eurasian collared-dove			X			X		X			X
PSITTACIDAE–PARROTS												
Psittacara mitratus	Mitred Parakeet							X	X			X
Amazona viridigenalis	red-crowned parrot			X	X	X	X	X	X	X	X	X
PYCNONOTIDAE–BULBULS												
Pycnonotus jocosus	red-whiskered bulbul					X	X	X			X	X
STURNIDAE–STARLINGS												
Sturnus vulgaris	European starling			X		X	X	X[a]	X[a]	X[a]	X	X[a]
PASSERIDAE–OLD WORLD SPARROWS												
Passer domesticus	house sparrow			X					X	X		X
ESTRILDIDAE–WAXBILLS AND MANNIKINS												
Lonchura punctulata	scaly-breasted munia	X	X		X		X	X[a]	X	X	X	X
MAMMALS												
***MAMMALIA*–MAMMALS**												
DIDELPHIDAE–AMERICAN OPPOSSUM FAMILY												
Didelphia virginiana	Virginia opossum						X					X

[a] Bird species observed nesting on the site.