BonTerra PSOMAS

Balancing the Natural and Built Environment

January 4, 2017

Belinda Kwan, PE
Water Resource Division
County of Los Angeles
Department of Public Works
900 South Fremont Avenue
Alhambra, California 91803-1331

VIA EMAIL
BKwan@dpw.lacounty.gov

Subject: Status Report for the Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project, Los Angeles County, California

Dear Ms. Kwan:

This status report addresses site conditions for the Los Angeles County Department of Public Works' (LACDPW's) 2014 *Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project* (OWHRMP). The OWHRMP describes the creation of 5.5 acres of oak woodland habitat and 2.5 acres of sage scrub habitat as compensation for impacts associated with the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project. The creation of oak woodland and sage scrub habitat is required by Mitigation Measures BIO-D and BIO-E in the LACDPW's 2009 *Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project Final Environmental Impact Report* and by the Streambed Alteration Agreement (Agreement, No. 1600-2008-0173-R5), which was granted by the California Department of Fish and Wildlife (CDFW) in 2009. The mitigation program includes a seven-year to ten-year maintenance and monitoring period that began after mitigation installation was completed in December 2014. The locations of the Upper, Middle, and Lower Sediment Placement Sites (SPS) are shown in Exhibits 1, 2, and 3. As detailed in the OWHRMP, final grading of the Lower SPS included the placement of approximately 30 feet of sediment (over the pre-existing condition) and the subsequent creation of dual, spiraling drainage channels to a relocated standpipe. The drainage design is intended to optimize retention and percolation of on-site precipitation and off-site inflows (from the eastern slopes). Final grading was completed by Quest Construction (for LACDPW) in October 2012.

The LACDPW retained BonTerra Psomas to prepare the 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. The reference site surveys were performed in existing oak woodland and sage scrub habitat areas on the Santa Anita Dam site for the purpose of developing mitigation performance criteria. BonTerra Psomas retained the following subcontractors/vendors: (1) S&S Seeds, Inc. (S&S) to collect site-specific native seeds (including oak acorns) and cuttings (cactus) in the Santa Anita Wash/Rio Hondo Sub-Watershed (started in 2011); (2) El Nativo Growers (ENG) and Rancho Santa Ana Botanic Garden (RSABG) 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); and (4) Nakae & Associates, Inc. (Nakae) to perform mitigation site preparation, installation, and long-term maintenance tasks. Site photographs are provided in Attachment A.

225 South Lake Avenue
Suite 1000
Pasadena, CA 91101

Tel 626.351.2000
Fax 626.351.2030
www.Psomas.com

SEED AND CUTTINGS COLLECTION

BonTerra Psomas (Biological Monitor) and S&S started local seed collection tasks in June 2011. Seed collection in 2011 was limited to the LACDPW's Santa Anita Dam property; however, the LACDPW secured access in 2012 to off-site open space areas in the Cities of Arcadia and Monrovia for more extensive seed collection. BonTerra Psomas/S&S collected cuttings (pads) of Vasey's prickly pear cactus (*Opuntia* x *vaseyi*) from the Middle SPS on the Santa Anita Dam site in June 2013. The cactus pads were selected from a minimum of ten separate cactus patches and were delivered to ENG for propagation on the same day they were collected. BonTerra Psomas Biologists have also collected small quantities of native seeds and rooted cuttings on the Santa Anita Dam property during native seed scouting activities. Most of the collected seed was applied to the mitigation site via hydroseeding or hand-broadcasting. A small portion of the collected seed material was used for container plant propagation. BonTerra Psomas/RSABG collected local seed (rare oaks) and cuttings (fern species) in October and November 2013. RSABG established fern "stock plants" (five different species with a minimum of ten individual plants each) in their nursery in 2013 (four species) and 2016 (a fifth species); the stock plants are used for ongoing rhizome cutting collection for vegetative propagation of four-inch fern container plants. RSABG propagated ferns and rare oaks for initial installation in 2014; however, most of the ferns were installed in 2015/2016 after niche planting sites were better established by improved canopy/shading from planted vegetation. BonTerra Psomas and S&S also collected oak acorns (multiple species) in 2015 for direct sowing on the mitigation site. No acorns were collected/planted on the site in 2016, due to very low crop production on oak trees in local wildlands, in order to (1) preserve vital forage values for wildlife; and (2) allow for local/natural re-seeding and regeneration of existing oak stands. BonTerra Psomas and S&S collected root and/or stem cuttings of several native plant species in the local subwatershed in 2015, including California milkweed (*Asclepias californica*), California lace fern (*Aspidotis californica*), lance-leaf dudleya (*Dudleya lanceolata*), California fuchsia (*Epilobium canum* ssp. *canum*), thickleaf yerba santa (*Eriodictyon crassifolium*), spiny redberry (*Rhamnus crocea*), hillside gooseberry (*Ribes californicum*), and California hedgenettle (*Stachys bullata*). BonTerra Psomas collected local cuttings of the following plant species in 2016: California false indigo (*Amorpha californica*), California milkweed (*Asclepias californica*), California lace fern (*Aspidotis californica*), wrinkled rush (*Juncus rugulosus*), basket rush (*Juncus textilis*), California peony (*Paeonia californica*), and California rose (*Rosa californica*). The cuttings of these species were delivered to RSABG for vegetative propagation. BonTerra Psomas and S&S collected seeds of numerous native plant species in 2015 and 2016, with special emphasis on (1) herbaceous plant species and (2) plant species that did not yet occur on the mitigation site. For many species, only trace quantities of seed were collected (i.e., <0.05 pound) due to the low availability of seed in a drought year and to avoid over-collection of seed from a particular patch or population that would impact wildlife food sources and plant reseeding/regeneration.

A total of 121 native plant species (seed and/or cuttings) have been collected to date in the local Sub-Watershed; this represents a diversity of installed plant species that is nearly four times (390 percent) greater than the diversity of the conceptual plant/seed palettes (31 plant species) that were listed in the OWHRMP. The seed species and quantities installed to date on the mitigation site are listed in Attachment B of this document.

MITIGATION SITE PREPARATION

BonTerra Psomas and the Nakae (a licensed landscape contractor that specializes in habitat restoration) started mitigation site preparation tasks in September 2013. The mitigation site (Exhibit 3) includes oak woodland habitat establishment on the deck portion of the Lower SPS and sage scrub establishment in slope areas on the Lower SPS. Site preparation included the following tasks:

1. Preliminary flagging of existing native plants (especially "volunteer" oak seedlings) to be protected on the mitigation site and in adjacent Buffer Weed Abatement Areas 1 and 2.

2. The installation of erosion-control measures, including fully biodegradable fiber rolls on the slopes of the Lower SPS (i.e., the sage scrub site) and fiber rolls and sandbags (temporary check dams) in the dual drainages of the plateau area (oak woodland site).
3. The initial treatment (via Aquamaster^{TM} herbicide) and/or removal of non-native plants from the mitigation site and adjacent buffer weed-abatement areas (including the slope that was manufactured by a development located adjacent to the Lower SPS).
4. The distribution and incorporation into the top two feet of topsoil (via heavy machinery) of a large volume of mulched native vegetation resulting from January 2011 construction activities at the Middle SPS.
5. The placement (in excavated pits) of a total of 14 artificial snags on the oak woodland site, consisting of large oak and sycamore trunks that were salvaged with a portion of the root tissue attached (for stability upon installation) during January 2011 construction activities.
6. The placement of several tons of conserved coarse woody debris (predominantly oak but also sycamore) on the oak woodland site, which was salvaged in January 2011.
7. The placement of many tons of boulders, rocks, and cobble on the oak woodland site, which were salvaged during sediment removal operations at Santa Anita Dam.
8. The installation of a temporary irrigation system, including overhead spray components (site-wide) and individual bubblers for each oak planting location.
9. The installation of temporary water tanks for wildlife ("drinkers") adjacent to the Middle SPS.
10. The construction of a temporary eight-foot-high perimeter fence (wood posts and smooth wire) to exclude large mammals (only) to reduce herbivory during the initial oak establishment phase.
11. The installation of interpretive signage on the site, explaining the goals of the OWHRMP. The mitigation site preparation tasks listed above were completed in January 2014, with the exception of the signage, which was installed in June 2014.

Protective wire cages were installed around approximately 50 volunteer (naturally occurring) coast live oak seedlings (*Quercus agrifolia* var. *agrifolia*) in the weed-abatement buffer area to reduce herbivory impacts.

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 four-inch mainline that extends north from the point of connection along the alignment of the Santa Anita Wash box channel.

MITIGATION SITE INSTALLATION–PHASE I (PLANT AND SEED MATERIALS)

BonTerra Psomas/Nakae performed mitigation site installation tasks (native plant and seed materials) in January/February 2014. The Phase I installation included the following tasks: (1) planting coast live oak acorns (10 per planting hole), installing protective caging and shade cloth at each oak location, and placing conserved oak leaf mulch at each oak planting site; (2) installing native container plants (4,963 total plants, including 358 coast live oak planting locations); and (3) installing native seed mixes (hydroseeding and hand-broadcasting) totaling approximately 135 pounds and including 78 different seeded plant species.

The Biological Monitor marked the container planting locations using color-coded wire flags for each plant species and flagged the various seed mix application areas in the field. The planting/seeding area

layouts roughly follow the conceptual planting plans provided in the OWHRMP; in addition, designated polygons were flagged and planted with cactus and herbaceous species (which will be maintained on a long-term basis free of other shrub species) to improve vegetative diversity. Initial container plant installation was completed in January 2014, and Phase I seed mix installation was completed in early February 2014 (a small number of additional Phase I container plants were installed on the site in March/April 2014, as these species became available from the nursery).

MITIGATION SITE INSTALLATION–PHASE II (PLANT AND SEED MATERIALS)

Nakae installed a total of 1,973 additional container plants and approximately 25 pounds of additional native seed of numerous plant species (all locally obtained) on the 8.0-acre mitigation site in December 2014, in coordination with the Biological Monitor. The Phase II container plants included ferns and rare oaks propagated by RSABG, including Engelmann oak (*Quercus engelmannii*), San Gabriel oak (*Quercus durata* var. *gabrielensis*), and four species of native ferns (e.g., coffee cliff-brake [*Pellaea andromedifolia*]). Most of the Phase II container materials for fall planting were propagated by ENG and included a variety of native shrubs, herbs, vines, and succulent species, most of which did not previously occur on the mitigation site (e.g., chaparral virgin's bower [*Clematis lasiantha*], giant wildrye [*Elymus condensatus*], and California coffeeberry [*Frangula californica* ssp. *californica*]). Additional native seed species (three total) installed in fall 2014 included stinging lupine (*Lupinus hirsutissimus*), wild heliotrope phacelia (*Phacelia distans*), and wild Canterbury bells (*Phacelia minor*), which all bloomed/seeded over much of the oak woodland mitigation site in spring 2015 and 2016. A total of 81 native seed species and 40 native container plant/cutting species were installed on the site in 2014. A summary of all native container plants and seed mix species and quantities installed to date is provided in Attachment B.

MITIGATION MAINTENANCE

The long-term (seven-year to ten-year) maintenance program started on January 1, 2015. In addition to maintenance of the 8.0-acre mitigation sites, Buffer Weed Abatement Areas (Buffer Areas) 1 and 2 (3.28 total acres) were established to remove invasive weed seed sources in the vicinity of the mitigation site. Supplemental Buffer Areas 3a/3b/4 (3.91 total acres) were added to the ongoing maintenance program in July 2016. The initial weed abatement tasks in Buffer Areas 3a and 4 included the girdling/treatment (with herbicide)/pruning of several non-native Shamel ash (*Fraxinus uhdei*) and Chinese pistache (*Pistacia chinensis*) trees. Most of these exotic trees were girdled/treated (rather than wholly removed) in order to retain beneficial snags for wildlife use. Acorn woodpeckers (*Melanerpes formicivorus*) are regularly observed using these snags during forays between the mitigation site and the pre-existing groves of mature coast live oak trees along the western property boundary. The mitigation site and adjacent buffer weed-abatement areas are essentially weed free, as non-native plant species are promptly treated and removed when observed during regular maintenance activities. Weeds are removed prior to seed production/dispersal to avoid re-infestation of the site. Herbicide use is minimized in favor of hand-pulling of weeds whenever possible.

Nakae is monitoring some minor erosion on the off-site slopes to the east of the mitigation site (i.e., Buffer Area No. 1); however, there is no significant erosion on the mitigation site, and there has been no problematic trespassing or trash deposition 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. Supplemental irrigation (bubblers only) is currently suspended on the oak woodland (SPS deck) mitigation site due to adequate seasonal rains in late 2016. Overhead irrigation has not been applied to the sage scrub planting areas (SPS slopes) since June 9, 2015. The frequency of irrigation will continue to be aggressively phased-out to foster adaptation of native plant species to the typical arid growing conditions in this region.

The Biological Monitor periodically coordinates with a representative of the San Gabriel Valley Vector Control District (SGVVCD) to discuss ongoing, potential mosquito vector issues associated with the drainage channels on the site. The SGVVCD typically performs vector control via the application of *Bacillus thuringiensis* (BTi), a bacterial/biological control material. SGVVCD applied a volatile mineral oil to control more mature mosquito larvae following a few past inspections (to maintain compliance with public health and safety codes); however, since project initiation, the LACDPW/BonTerra Psomas have requested that SGVVCD use only BTi on the site (rather than other materials, to the extent practicable) to minimize adverse impacts on mitigation habitat (e.g., arthropod species diversity and abundance). The LACDPW is currently assessing the uneven settling of placed sediment in portions of the spiraling drainages that may require minor fill placement (via hand tools) to restore a consistent flow line from the inflow point to the outlet tower.

Nakae performed additional exotic plant species removal on the slopes to the east of the mitigation site in October 2014. The LACDPW obtained rights-of-entry from several private landowners to allow access for the voluntary removal of numerous invasive Mexican fan palms (*Washingtonia robusta*) and other non-native, perennial plant species. The east slope exotic vegetation removal was coordinated with the Biological Monitor to ensure that biological resources were not adversely impacted during these activities. The removal of these invasive plants from areas adjacent to the mitigation site will improve long-term mitigation site performance by eliminating a significant source of weed seeds that would otherwise infest the site on an ongoing basis.

SUPPLEMENTAL PLANTING AND SEEDING–2015/2016

As noted above, the Biological Monitor monitored/coordinated the collection and propagation of supplemental seed and cuttings materials with RSABG and S&S in 2015 and 2016, including field collections from open space areas in the Cities of Monrovia and Sierra Madre, and on the County's Santa Anita Dam/Reservoir site, upstream of the mitigation site. Supplemental planting and seeding occurred in December 2015/February 2016, and a summary of these materials is provided in Tables 1 and 2. The supplemental container planting in 2015/2016 included primarily native ferns (309 plants) of several species; native grasses (641 plants); and a variety of native shrubs, perennials, and succulents, several of which did not previously occur on the mitigation site. A preliminary list of container plants to be installed in January 2017 is provided in Table 2. Supplemental seeding of oak acorns occurred on the oak woodland site in December 2015 to provide added contingency plants (as needed) toward compliance with mitigation performance criteria. Seed of native herbaceous species was installed in designated shrub-free portions of the oak woodland and sage scrub mitigation sites in 2015/2016 to improve coverage and diversity of native herbs and grasses in these areas. The enhancement of herbaceous areas on the mitigation site improves overall ecological functions and values, including pollinator resources. A total of 60 packets of mixed herbaceous plant species were also prepared and installed in and immediately adjacent to numerous boulder and woody debris assemblages on the site in 2015/2016. Several of the plant species from the packets have already germinated in these niches, including Dudley's clarkia (*Clarkia dudleyana*) and scarlet larkspur (*Delphinium cardinale*). A total of 4.0 pounds of showy beardtongue seed (*Penstemon spectabilis*), and trace amounts of seed of several other shrubs/annual/perennial plant species, were sown on the mitigation site in December 2016.

TABLE 1
SUPPLEMENTAL CONTAINER PLANTS (DECEMBER 2015/FEBRUARY 2016)

Plant Species[a]		Container Size	Quantity		
Botanical Name	**Common Name**		**Dec. 2015**	**Feb. 2016**	**Total**
Aspidotis californica[b]	California lace fern	4-inch pot	0	6	6
Dryopteris arguta	coastal woodfern	4-inch pot	24	0	24
Dudleya lanceolata[b]	lance-leaved dudleya	4-inch pot	0	32	32
Epilobium canum ssp. *canum*	California fuchsia	3-inch x 6-inch tree-band	37	9	46
Eriodictyon crassifolium	thickleaf yerba santa	1-gallon	3	0	3
		4-inch pot	2	0	2
Pellaea andromedifolia	coffee cliff-brake	4-inch pot	85	43	128
Pellaea mucronata var. *mucronata*	bird's-foot cliff-brake	4-inch pot	60	0	60
Polypodium californicum	California polypody	4-inch pot	74	17	91
Ribes californicum[b]	hillside gooseberry	3-inch x 6-inch tree-band	24	5	29
Stachys bullata	California hedgenettle	4-inch pot	110	25	135
Stipa lepida[b]	foothill needle grass	2-inch liner	200	441	641
Total			**619**	**578**	**1,197**

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

[b] Plant species that did not occur on the OWHRMP site prior to Dec. 2015/Feb. 2016 planting.

TABLE 2
CONTAINER PLANT SPECIES – JANUARY 2017 (PRELIMINARY LIST)

Plant Species[a]		Container Size	Total
Botanical Name	**Common Name**		
Aspidotis californica	California lace fern	4-inch pot	10
Dryopteris arguta	coastal woodfern	4-inch pot	12
Epilobium canum ssp. *canum*	California fuchsia	3-inch x 6-inch tree-band	1
Juncus rugulosus	basket rush	4-inch pot	55
Juncus textilis	wrinkled rush	4-inch pot	48
Paeonia californica	California peony	3-inch x 6-inch tree-band	8
Pellaea andromedifolia	coffee cliff-brake	4-inch pot	21
Pellaea mucronata var. *mucronata*	bird's-foot cliff-brake	4-inch pot	15
Polypodium californicum	California polypody	4-inch pot	113
Ribes californicum	hillside gooseberry	3-inch x 6-inch tree-band	2
Rosa californica[b]	California rose	3-inch x 6-inch tree-band	6
Stipa lepida	foothill needle grass	2-inch liner	218
		Total	**509**

[a] All container species were propagated from cuttings/seed collected in the Santa Anita Wash/Rio Hondo Sub-Watershed. Additional plant species (not listed above) that are currently in propagation (December 2016) include California false indigo (*Amorpha californica*) and California milkweed (*Asclepias californica*).

[b] Plant species that does not occur on the OWHRMP as of December 2016.

TABLE 3
SUPPLEMENTAL SEED SPECIES (DECEMBER 2015 AND DECEMBER 2016)

Plant Species[a]		Quantity (Pounds)	
Botanical Name	**Common Name**	**2015**	**2016**
Acer macrophyllum	big-leaf maple	0.10	---
Castilleja applegatei[b]	Applegate's Indian paintbrush	trace	trace
Clarkia dudleyana[b]	Dudleya's clarkia	trace	---
Clematis lasiantha	chaparral clematis	0.25	---
Delphinium cardinale[b]	cardinal larkspur	trace	---
Dudleya lanceolata[b]	lance-leaved dudleya	trace	---
Epilobium canum ssp. *canum*[b]	California fuchsia	trace	---
Erigeron foliosus var. *foliosus*[b]	leafy daisy	trace	trace
Eriophyllum confertiflorum ssp. *confertiflorum*[b]	golden woolly sunflower	trace	trace
Eulobus californicus	false-mustard	0.82	---
Hazardia squarrosa var. *grindelioides*	southern saw toothed goldenbush	trace	---
Holodiscus discolor	off colored oceanspray	trace	trace
Lathyrus vestitus[b]	canyon sweet pea	trace	---
Lonicera subspicata var. *johnstonii*	Johnston's honeysuckle	trace	0.05
Lupinus concinnus	bajada lupine	trace	---
Lupinus hirsutissimus	stinging lupine	3.41	---
Lupinus longifolius	long leaf lupine	trace	---
Lupinus truncatus	cut leaf lupine	trace	---
Malacothrix saxatilis	cliff desert dandelion	2.22	---
Marah macrocarpa	large fruit wild cucumber	trace	---
Mentzelia laevicaulis	smooth stem blazing star	trace	---
Mimulus cardinalis	scarlet monkeyflower	---	trace
Penstemon spectablis var. *spectabilis*	showy beardtongue	5.52	4.00
Phacelia minor	wild Canterbury bells	12.21	---
Rhamnus crocea	spiny redberry	---	0.05
Rhamnus ilicifolia	hollyleaf redberry	---	0.05
Quercus agrifolia var. *agrifolia* (acorns)	coast live oak	10.00	---
Quercus chrysolepis (acorns)	canyon live oak	1.00	---
Quercus durata var. *gabrielensis*	San Gabriel oak	0.10	---
Quercus engelmannii (acorns)	Engelmann oak	5.00	---
Silene laciniata[b]	cardinal catchfly	trace	trace
Solidago velutina	velvety goldenrod	trace	---
Stephanomeria cichoriacea[b]	chicoryleaf wire-lettuce	trace	trace
Stipa lepida	foothill needle grass	0.06	---
Total		**40.69**	**4.15**

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).

MITIGATION PERFORMANCE

As of December 2016, the mitigation site already supports an excellent diversity of plant and animal species and is developing vegetation structure/cover. A total of 134 native plant species have been observed on the site, including trees, shrubs, sub-shrubs, vines, succulents, herbs, grasses, ferns, spike-moss, and emergent plant species. Oak tree seedling survival currently exceeds 100 percent (compared to the quantities specified in the OWHRMP) due to supplemental Phase II planting of oaks and additional germination of volunteer oaks on the site. Most of the oak saplings now exceed six to eight feet in height. As the growing branch tips of these larger oaks rise above deer browsing height, Nakae is removing the upper four feet of caging to enable the trees to assume a natural, spreading form. The lower two feet of temporary caging is being left in place as a longer-term rodent deterrent.

Beneficial decay processes, including the growth of fungi (several species), have been observed in the coarse woody debris assemblages. 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 the mitigation site for many years.

Two 'camera traps' (motion-activated video cameras) were installed on and adjacent to the mitigation site in 2016 to provide enhanced, 24-hour wildlife observation data. Two western bluebird nest boxes (per National Audubon Society guidelines) and three mason bee nest houses were installed on the site. The LACDPW installed all of these items on a voluntary basis to enhance wildlife values and monitoring on the site. Wildlife species—including coyote (*Canis latrans*), common gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), and southern mule deer (*Odocoileus hemionus*)—have been observed using the two drinker tanks that were installed just northeast of the Lower SPS to provide a water source for wildlife. Three species of birds were observed nesting on the mitigation site in 2014 (killdeer [*Charadrius vociferus*], common yellowthroat [*Geothlypis trichas*], and acorn woodpecker [*Melanerpes formicivorus*]). Four bird species were observed nesting on the mitigation site and adjacent/maintained buffer areas in 2015 (acorn woodpecker, northern mockingbird [*Mimus polyglottos*], phainopepla [*Phainopepla nitens*], and California towhee [*Melozone [Pipilo] crissalis*), while two bird species (western bluebird [*Sialia mexicana*], and rock wren [*Salpinctes obsoletus*]) exhibited nesting behaviors (though they did not subsequently nest) on the site in March 2015. The Biological Monitor will continue to note wildlife species observed on the site and ensure that maintenance activities do not adversely impact sensitive biological resources. California ground squirrels (*Otospermophilus beecheyi*), rock wrens, native reptiles (including striped racer [*Coluber lateralis*], a snake species), raptors, and other wildlife species are increasingly colonizing the created boulder and woody debris piles and perching on the installed snags. A total of 94 native vertebrate wildlife species (81 native bird species) have been observed on the site, in addition to numerous native invertebrate species (e.g., butterflies, beetles, bees, dragonflies) since project initiation in September 2013. The compendia of all native plant and wildlife species observed on the site are provided in Attachments C and D, respectively.

Phase II installation was completed in December 2014, and the seven-year to ten-year mitigation maintenance clock began on January 1, 2015. The first quantitative survey of the mitigation site was performed in April/May 2016, and the associated report (*First Annual Monitoring Report, Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project* [BonTerra Psomas 2016]) was completed in October 2016. The Year One AMR indicates that the mitigation site has already met or exceeded most of the ten-year performance standards of the HMMP. The quantitative surveys include the performance of vegetation quadrats and transects; the evaluation of all oak trees on the site by a Certified Arborist; site photographs from established photo stations; and other performance analyses.

Qualitative and quantitative monitoring will continue through Years 7 to 10 until the mitigation program has been signed off on by the CDFW and the City of Arcadia. The Year One AMR will be posted on the LACDPW website at http://www.dpw.lacounty.gov/wrd/Projects/SAHMP/.

Please call Richard Lewis at (626) 351-2000 with any questions regarding this report.

Sincerely,
BonTerra Psomas

Melissa A. Howe
Vice President, Resource Management

Richard B. Lewis, III
Senior Project Manager

Enclosures: Exhibit 1 – Project Vicinity
Exhibit 2 – Sediment Placement Site Locations
Exhibit 3 – Mitigation Site Location (Lower Sediment Placement Site)
Attachment A – Site Photographs
Attachment B – Installed Native Plant and Seed Materials
Attachment C – Native Plant Compendium (September 2013–December 2016)
Attachment D – Wildlife Compendium (September 2013–December 2016)

cc: Kalvin Lam (KLam@dpw.lacounty.gov)
Pat Wood (PWood@dpw.lacounty.gov)
Marc Blain, BonTerra Psomas
Joan Kelly, BonTerra Psomas

REFERENCES

BonTerra Psomas. 2016 (October). *First Annual Monitoring Report, Oak Woodland Habitat Revegetation/Mitigation Program for the Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project.* Pasadena, CA: BonTerra Psomas.

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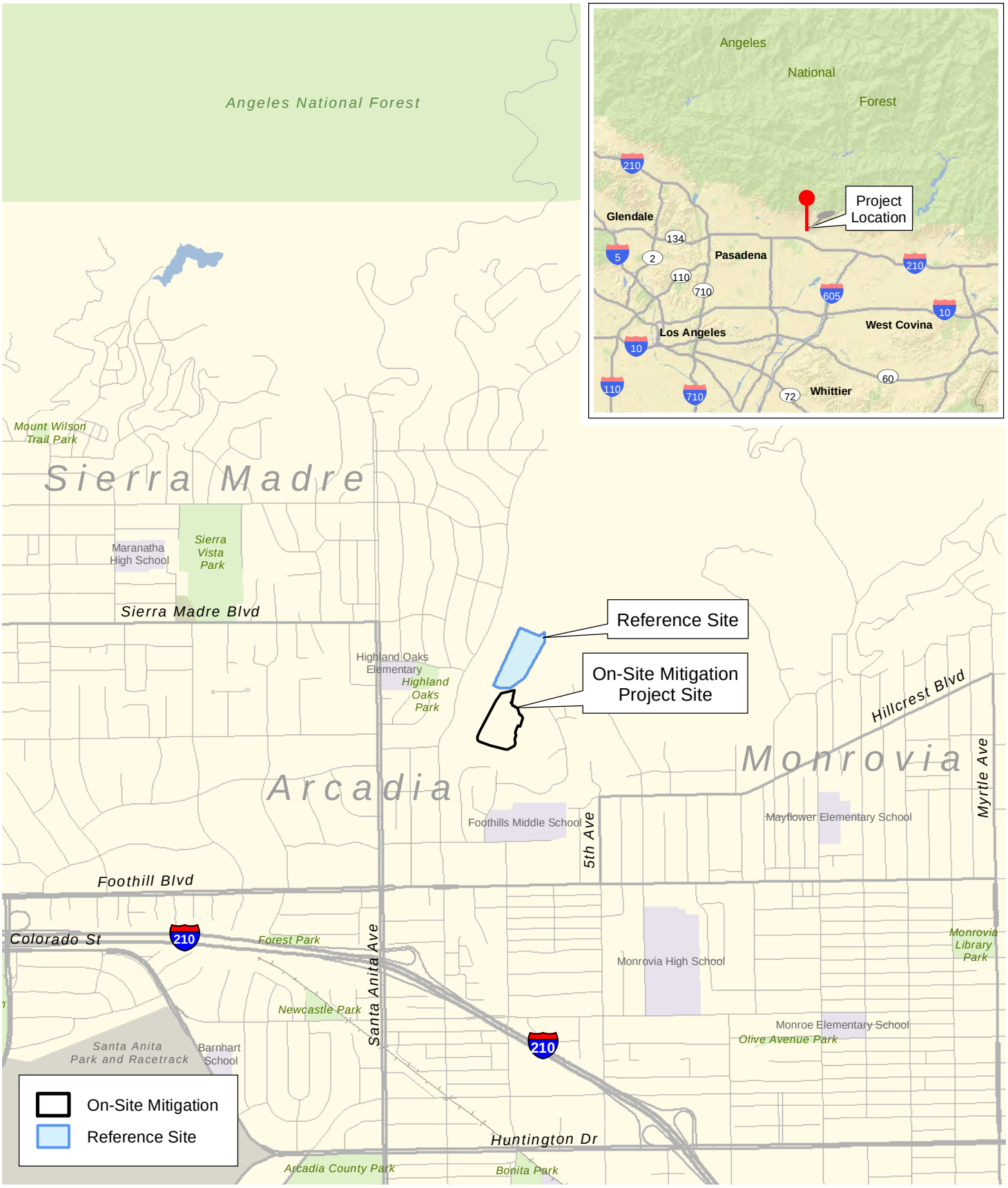

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Project Vicinity

Exhibit 1

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

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Sediment Placement Site Locations

Exhibit 2

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

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S

600 300 0 600
Feet

BonTerra PSOMAS

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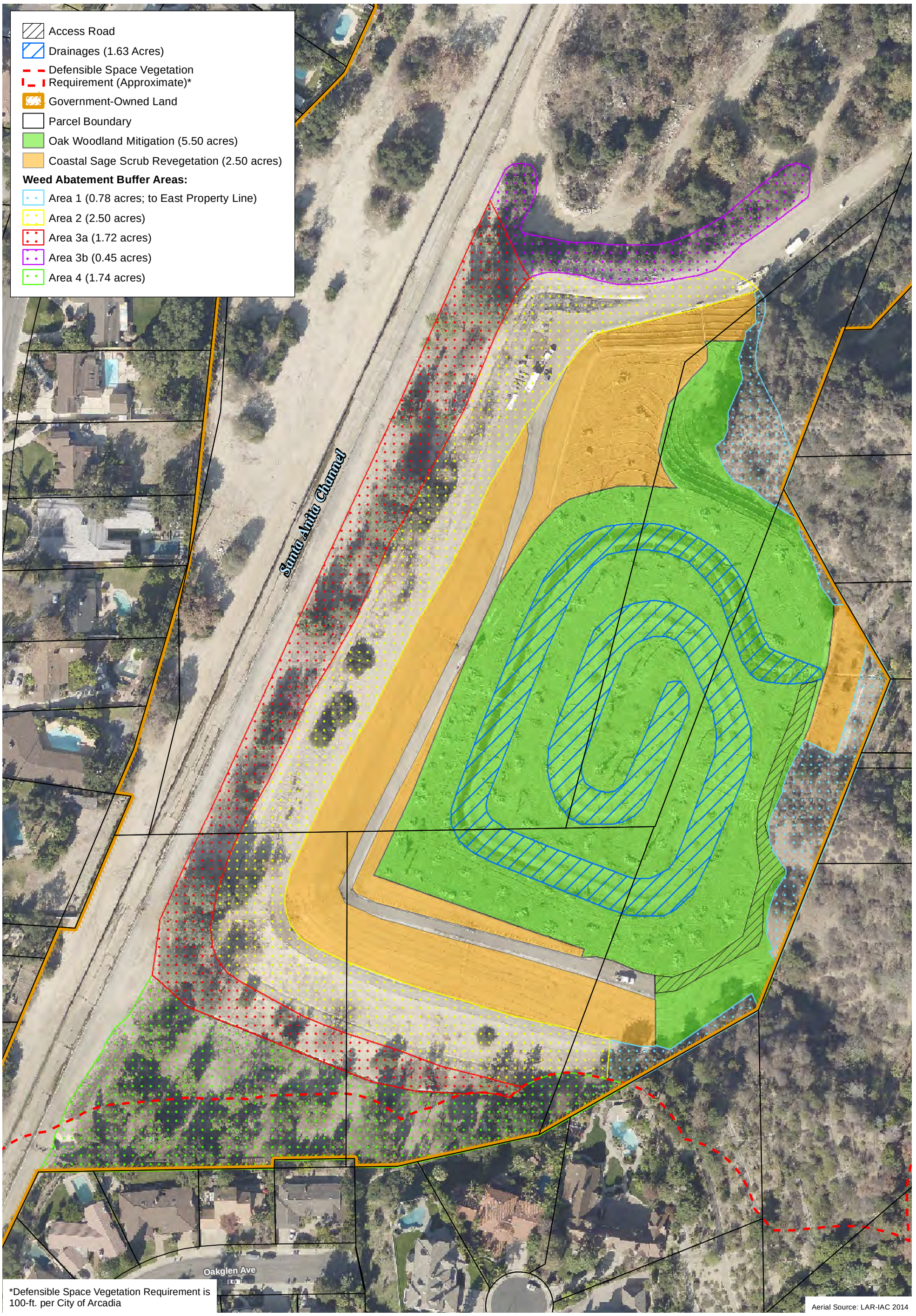

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Mitigation Site Location (Lower Sediment Placement Site)

Exhibit 3

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

N W E S

125 62.5 0 125 Feet

BonTerra PSOMAS

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ATTACHMENT A

SITE PHOTOGRAPHS

December 2016. Robust growth of planted coast live oaks among native shrubs, perennials, and placed coarse woody debris. Irrigation has been aggressively reduced to facilitate proper root growth and drought adaptation of all oak species.

December 2016. New tip growth on a healthy planted Engelmann oak, a rare local tree species. Several San Gabriel oaks, another rare local plant species, were also installed at the mitigation site.

July 2016. A naturalistic assemblage of salvaged boulders and coarse woody debris surrounded by diverse native vegetation. Although this appears to be an ancient landscape, the installation of these materials was completed in 2014, approximately 2.5 years before the photo was taken.

December 2016. A spreading patch of California hedgenettle growing into a placed pile of salvaged native brush. The California hedgenettle plants were propagated from root/stem cuttings obtained from natural areas in the local subwatershed.

December 2016. Temporary retention of off-site inflows to the mitigation site provide valuable wildlife resources and improve on-site hydrology for oak species. Vegetation in the created streambed is managed to allow access for vector control authorities' inspection and treatment tasks.

December 2016. Portions of the mitigation site (such as this south-facing slope) are dedicated to cactus and yucca species with native grasses and herbs (i.e., without woody shrubs) to provide contrasting habitat functions.

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Site Photographs

Exhibit 4

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

Bonterra PSOMAS

December 2016. A native toyon shrub producing a heavy crop of fruit, which is valuable for many wildlife species.

December 2016. A volunteer nightshade plant (a perennial herb) with abundant fruit. Numerous native volunteers (i.e., plants that naturally colonize the site from adjacent habitat areas) are carefully protected during maintenance activities.

August 2016. A BonTerra Psomas ecologist inspects a freshly dug root mass of wrinkled rush in nearby Sawpit Creek. Seed and cuttings of several plant species were collected in the local subwatershed for supplemental nursery propagation in 2016.

December 2016. Cliff desert dandelion, a native perennial plant species with a long blooming season.

September 2016. California fuchsia, a native subshrub that blooms in the late summer and fall. The diverse palette of planted and seeded species provides valuable year-round resources (e.g., pollen, nectar, fruit) for resident and migratory wildlife species.

December 2016. A showy beardtongue seedling (left in photo) with dried stalks of four-spot and new seedlings of wild heliotrope phacelia. Portions of the mitigation site are maintained as native wildlfower meadows among planted oaks, without other woody plant species.

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Site Photographs

Exhibit 5

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

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December 2016. An acorn woodpecker perched in one of several natural snags that was placed on the mitigation site in 2013.

December 2016. A family group of several acorn woodpeckers on a placed natural snag. This bird species nested on the mitigation site in 2014, 2015, and 2016.

December 2016. Acorn woodpeckers are caching acorns in the placed snags, and some snags are becoming high value acorn 'granaries'. Without the placement of snags, these habitat values would not be provided on an oak planting site for hundreds of years.

December 2016. A golden-crowned sparrow perched in one of the few volunteer willow trees that was retained on the mitigation site. This bird species was observed for the first time on the mitigation site in December 2016.

December 2016. A rufous-crowned sparrow in a planted coast live oak tree.

June 2016. California towhee nestlings in a California sagebrush plant on the mitigation site. BonTerra Psomas' biologists ensure that nesting birds and other sensitive biological resources are protected during maintenance activities.

Site Photographs

Exhibit 6

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

BonTerra PSOMAS

December 2016. There is effective ongoing weed control in the Weed Abatement Buffer Areas (pictured here: Buffer Area 1, implemented in 2013). Also visible are several exclosures (cages) that contain planted oak trees. The cages were installed with protective shade cloth.

December 2016. Buffer Area 2 (implemented in 2013) has increasing cover of volunteer native vegetation as a result of assertive weed control. The Buffer Areas are kept weed-free to avoid dispersal of invasive weed seeds into the mitigation site from adjacent areas.

July 2016. The restoration contractor (Nakae & Associates) implemented several new Buffer Areas in 2016 under the supervision of BonTerra Psomas ecologists. In this photograph (Buffer Area 3a), castor bean seeds are being carefully bagged to avoid dispersal during weed removal tasks.

September 2016. Several exotic trees were removed or pruned in 2016 (Buffer Areas 3a and 4) to remove invasive seed sources adjacent to the mitigation site. The resulting snags were retained to provide wildlife value (perches) after girdling and herbicide treatment.

December 2016. Effective weed control in Buffer Area 4. The buffer weed abatement program reduces weed seeds; improves fire fuel protection for adjacent residents; and improves local aesthetic values.

July 2016. Large containers full of green waste were removed by the restoration contractor in July 2016. The County of Los Angeles Department of Public Works is voluntarily implementing 7.2 acres of buffer weed abatement in areas that surround the 8.0-acre mitigation site.

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Site Photographs

Exhibit 7

Status Report: Oak Woodland Habitat Revegetation/Mitigation Program;
Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project

BonTerra PSOMAS

ATTACHMENT B

INSTALLED NATIVE PLANT AND SEED MATERIALS

ATTACHMENT B-1

CONTAINER PLANT SPECIES INSTALLED
(JANUARY 2014–FEBRUARY 2016)

CONTAINER PLANTS AND CUTTINGS INSTALLED
(JANUARY 2014–FEBRUARY 2016)

Container Plants and Cuttings Species[a]		Container Plants and Cuttings Quantities			
Scientific Name	**Common Name**	**Phase I (Jan/Feb 2014)**	**Phase II (Dec 2014)**	**Supplemental (2015/2016)**	**Total**
Acmispon glaber var. *glaber*	glabrous deerweed	400	0	0	**400**
Acourtia microcephala (cuttings)	small-headed acourtia	0	10	0	**10**
Artemisia californica	California sagebrush	1,050	0	0	**1,050**
Artemisia douglasiana (cuttings)	mugwort	10	0	0	**10**
Artemisia douglasiana	mugwort	0	100	0	**100**
Asclepias californica (cuttings)	California milkweed	0	10	0	**10**
Aspidotis californica	California lace fern	0	0	6	**6**
Asclepias fascicularis[b]	narrow-leaf milkweed	0	0	0	**0**
Ceanothus leucodermis	chaparral whitethorn	0	75	0	**75**
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain-mahogany	0	50	0	**50**
Clematis lasiantha	chaparral clematis	0	200	0	**200**
Dryopteris arguta	coastal woodfern	0	5	24	**29**
Dudleya lanceolata	lance-leaved dudleya	0	0	32	**32**
Elymus condensatus	giant wildrye	0	80	0	**80**
Epilobium canum ssp. *canum*	California fuchsia	0	0	46	**46**
Eriodictyon crassifolium	thickleaf yerba santa	0	0	5	**5**
Eriogonum fasciculatum var. *foliolosum*	leafy California buckwheat	750	0	0	**750**
Frangula californica ssp. *californica*	California coffeeberry	0	100	0	**100**
Hesperoyucca whipplei	chaparral yucca	150	100	0	**250**
Heteromeles arbutifolia	toyon	55	0	0	**55**
Juncus textilis (cuttings)	basket rush	10	0	0	**10**
Keckiella cordifolia	heartleaf bush penstemon	0	271	0	**271**
Lonicera subspicata var. *denudata*	Johnston's honeysuckle	0	20	0	**20**
Malosma laurina	laurel sumac	40	0	0	**40**
Melica imperfecta	little California melica	150	125	0	**275**
Mimulus aurantiacus var. *pubescens*	hairy bush monkeyflower	425	0	0	**425**
Opuntia ×vaseyi	Vasey's prickly pear	200	100	0	**300**
Pellaea andromedifolia (cuttings)	coffee cliff-brake	5	0	0	**5**

CONTAINER PLANTS AND CUTTINGS INSTALLED
(JANUARY 2014–FEBRUARY 2016)

Container Plants and Cuttings Species[a]		Container Plants and Cuttings Quantities			
Scientific Name	**Common Name**	**Phase I (Jan/Feb 2014)**	**Phase II (Dec 2014)**	**Supplemental (2015/2016)**	**Total**
Pellaea andromedifolia	coffee cliff-brake	0	20	128	**148**
Pellaea mucronata var. *mucronata*	bird's-foot cliff-brake	0	5	60	**65**
Penstemon spectabilis var. *spectabilis*	showy beardtongue	75	5	0	**80**
Polypodium californicum	California polypody	0	20	91	**111**
Prunus ilicifolia ssp. *ilicifolia*	holly leaf cherry	0	50	0	**50**
Pseudognaphalium californicum	California everlasting	460	0	0	**460**
Quercus agrifolia var. *agrifolia*[c]	coast live oak	358	0	0	**358**
Quercus agrifolia var. *agrifolia*[d]	coast live oak	0	24	0	**24**
Quercus engelmannii	Engelmann oak	0	57	0	**57**
Quercus durata var. *gabrielensis*	San Gabriel oak	0	25	0	**25**
Rhamnus ilicifolia	hollyleaf redberry	0	31	0	**31**
Rhus aromatica (cuttings)	skunk bush	10	0	0	**10**
Rhus ovata	sugar bush	55	0	0	**55**
Ribes aureum var. *gracillumum*	little graceful golden currant	100	275	0	**375**
Ribes californicum	hillside gooseberry	0	0	29	**29**
Rubus ursinus (cuttings)	California blackberry	10	0	0	**10**
Salvia apiana	white sage	250	150	0	**400**
Salvia mellifera	black sage	400	0	0	**400**
Sambucus nigra ssp. *caerulea*	blue elderberry	0	55	0	**55**
Selaginella bigelovii	bushy spike-moss	0	10	0	**10**
Stachys bullata	California hedgenettle	0	0	135	**135**
Stipa lepida	foothill needle grass	0	0	641	**641**
Total (47 Native Container Plant/Cuttings Species)		**4,963**	**1,973**	**1,197**	**8,133**

[a] Additional container plant and cuttings species will be propagated and installed in 2017.
[b] Seed for this species has yet to be obtained in the Santa Anita Wash/Rio Hondo Sub-Watershed for propagation.
[c] Initial oak planting locations established via direct sown acorns/seedlings.
[d] Supplemental planting of oaks in "T4" (deep 1-gallon) size.

ATTACHMENT B-2

NATIVE SEED SPECIES COLLECTED/INSTALLED

(JANUARY 2014–DECEMBER 2015)

NATIVE SEED SPECIES COLLECTED/INSTALLED
(JANUARY 2014–DECEMBER 2015)

Scientific Name	Common Name	Pounds Collected	Seed Quantities				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 Sub-Watershed 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	hairy suncup	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	chaparral yucca	42.34	1.00	—	—	2.00	**3.00**
Mimulus aurantiacus var. *pubescens*	hairy bush monkeyflower	19.88	0.50	2.00	2.00	1.00	**5.50**
Phacelia cicutaria	caterpillar phacelia	0.56	0.26	0.10	0.10	0.10	**0.56**
Pseudognaphalium californicum	California everlasting	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 (26 Total) Collected to Date by S&S Seeds in the Santa Anita Wash/Rio Hondo Sub-Watershed (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 jimson weed	0.56	0.20	0.16	0.10	0.10	**0.56**
Eulobus californicus	false-mustard	0.82	—	—	0.41	0.41	**0.82**
Heteromeles arbutifolia	toyon	5.78	—	—	1.00	—	**1.00**
Lepidospartum squamatum	California scale-broom	14.56	—	—	1.00	—	**1.00**
Lupinus hirsutissimus	stinging lupine	11.90	—	—	9.90	2.00	**11.90**
Malacothrix saxatilis	cliff desert dandelion	2.22	—	—	1.11	1.11	**2.22**
Oenothera elata ssp. *hirsutissima*	great marsh evening primrose	0.04	—	—	0.04	—	**0.04**
Penstemon spectabilis var. *spectabilis*	showy beardtongue	5.52	—	—	2.00	3.52	**5.52**
Phacelia distans	wild heliotrope 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 leaf cherry	9.20	—	—	4.00	—	**4.00**
Pseudognaphalium stramineum	cotton batting everlasting	3.20	1.00	0.20	1.00	1.00	**3.20**
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	California 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 (33 Native Seed Species)	**408.71**	**47.26**	**14.51**	**62.20**	**25.04**	**149.01**

NATIVE SEED SPECIES COLLECTED/INSTALLED
(JANUARY 2014–DECEMBER 2015)

Scientific Name	Common Name	Pounds Collected	Seed Quantities				Total Pounds Installed
			Sage Scrub Seed Mixes/Aspect		Hand-Seeding		
			South/West (2.0 acres)	North (0.54 acre)	Oak Woodland	Sage Scrub	
Seed Species (71 Total) Collected to Date by BonTerra Psomas in the Santa Anita Wash/Rio Hondo Sub-Watershed (small quantities, <1.0 lb collected per species, except as noted)							
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* (bigberry manzanita), *Brickellia californica* (California brickellbush), *Brickellia nevinii* (Nevin's brickellbush), *Castilleja applegatei* (Applegate's Indian paintbrush), *Ceanothus leucodermis* (chaparral whitethorn), *Ceanothus oliganthus* (hairy ceanothus), *Cercocarpus betuloides* var. *betuloides* (birch-leaf mountain-mahogany), *Cirsium occidentale* var. *californicum* (cobwebby thistle), *Clarkia dudleyana* (Dudley's clarkia), *Clematis lasiantha* (chaparral clematis), *Corethrogyne filaginifolia* (common sandaster), *Datura wrightii* (Wright's jimsonweed), *Delphinium cardinale* (scarlet larkspur), *Dudleya lanceolata* (lance-leaved dudleya), *Elymus condensatus* (giant wildrye), *Epilobium canum* ssp. *canum* (California fuchsia), *Ericameria parishii* var. *parishii* (Parish's goldenbush), *Erigeron foliosus* var. *foliosus* (leafy daisy), *Eriodictyon crassifolium* (thickleaf yerba santa), *Eriogonum elongatum* var. *elongatum* (longstem buckwheat), *Eriophyllum confertiflorum* ssp. *confertiflorum* (golden woolly sunflower), *Frangula californica* ssp. *californica* (California coffeeberry), *Galium angustifolium* ssp. *angustifolium* (narrow leaved bedstraw), *Hazardia squarrosa* var. *grindelioides* (southern saw-toothed goldenbush), *Hesperoyucca whipplei* (chaparral yucca), *Heteromeles arbutifolia* (toyon), *Heterotheca grandiflora* (telegraph weed), *Holodiscus discolor* (off colored oceanspray), *Juncus rugulosus* (wrinkled rush), *Juncus textilis* (basket rush), *Keckiella cordifolia* (heartleaf keckiella), *Lathyrus vestitus* (canyon sweet pea), *Lepidospartum squamatum* (California scale-broom), *Linanthus californicus* (prickly phlox), *Lonicera subspicata* var. *denudata* (Johnston's honeysuckle), *Lupinus concinnus* (bajada lupine), *Lupinus longifolius* (long leaf lupine), *Lupinus truncatus* (cut leaf lupine), *Malacothrix saxatilis* (cliff desert dandelion), *Marah macrocarpus* (large fruit wild cucumber), *Melica imperfecta* (little California melica), *Mentzelia laevicaulis* (smooth stem blazing star), *Mimulus aurantiacus* var. *pubescens* (hairy bush monkeyflower), *Mirabilis laevis* var. *crassifolia* (coastal wishbone plant), *Paeonia californica* (California peony), *Penstemon spectabilis* var. *spectabilis* (showy beardtongue), *Phacelia cicutaria* (caterpillar phacelia), *Phacelia ramosissima* (branching phacelia), *Pseudognaphalium bioletti* (bi-color everlasting), *Pseudognaphalium californicum* (California everlasting), *Pseudognaphalium canescens* (hairy everlasting), *Quercus agrifolia* var. *agrifolia* (coast live oak), *Quercus chrysolepis* (canyon live oak; 1.0 lb), San Gabriel oak (*Quercus durata var. gabrielensis*) , *Quercus engelmannii* (Engelmann oak; 5.0 lb), *Rhus ovata* (sugar bush), *Ribes aureum* var. *gracillimum* (little graceful golden currant), *Salvia apiana* (white sage), *Salvia mellifera* (black sage), *Senecio flaccidus* var. *douglasii* (Douglas' threadleaf ragwort), *Silene laciniata* (cardinal catchfly), *Solidago velutina* (velvety goldenrod), *Stephanomeria cichoriacea* (chicoryleaf rock-lettuce), *Stipa coronata* (crested needle grass), *Symphoricarpos* cf. *mollis* (creeping snowberry), *Umbellularia californica* (California bay).							
Cuttings Species (17 Total) and Rare Oak Acorns (2 Species) Collected to Date by BonTerra Psomas, Rancho Santa Ana Botanic Garden, and S&S Seeds in the Santa Anita Wash/Rio Hondo Sub-Watershed							
Acourtia microcephala	small-headed acourtia	Direct planting on mitigation site.					
Artemisia douglasiana	mugwort	Direct planting on mitigation site.					
Asclepias californica	California milkweed	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.					
Dryopteris arguta	California woodfern	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 textilis	basket rush	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 cliff-brake	Rhizome cuttings for 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 (only).					
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).					
Rubus ursinus	California blackberry	Direct planting on mitigation site.					
Selaginella bigelovii	bushy spike-moss	Direct planting on mitigation site.					
Stachys bullata	California 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; lb: pound.

ATTACHMENT C

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (134 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
LYCOPHYTES			
SELAGINELLACEAE–SPIKE-MOSS FAMILY			
Selaginella bigelovii	bushy spike-moss		
FERNS			
DRYOPTERIDACEAE–WOOD FERN FAMILY			
Dryopteris arguta	coastal woodfern		
POLYPODIACEAE–POLYPODY FAMILY			
Polypodium californicum	California polypody		
PTERIDACEAE–BRAKE FAMILY			
Aspidotis californica	California lace fern		
Pellaea andromedifolia	coffee cliff-brake		
Pellaea mucronata var. *mucronata*	bird's-foot cliff-brake		
CERATOPHYLLALES			
CERATOPHYLLACEAE–HORNWORT FAMILY			
Ceratophyllum demersum	vascular hortwort		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 californica	California milkweed		
ASTERACEAE–SUNFLOWER FAMILY			
Acourtia microcephala	small-headed acourtia		
Ambrosia acanthicarpa	annual bur-sage		
Artemisia californica	California sagebrush		
Artemisia douglasiana	Douglas' sagebrush		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	common 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 woolly sunflower		

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (134 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
Hazardia squarrosa var. *grindelioides*			
Helianthus annuus	annual sunflower		FACU
Heterotheca grandiflora	telegraph weed		
Heterotheca sessiliflora ssp. *fastigiata*	upright sessileflower false goldenaster		
Lasthenia gracilis	common goldfields		
Lepidospartum squamatum	California scale-broom		FACU
Malacothrix saxatilis	cliff desert dandelion		
Pseudognaphalium biolettii	bi-color everlasting		
Pseudognaphalium californicum	California everlasting		
Pseudognaphalium canescens	hairy everlasting		FACU
Pseudognaphalium stramineum	cotton batting everlasting		FAC
Senecio flaccidus var. *douglasii*	Douglas' threadleaf ragwort		
BORAGINACEAE–BORAGE FAMILY			
Cryptantha intermedia var. *intermedia*	common cryptantha		
Eriodictyon crassifolium	thickleaf yerba santa		
Eriodictyon parryi	poodle-dog bush		
Phacelia cicutaria	caterpillar phacelia		
Phacelia distans	wild heliotrope phacelia		OBL
Phacelia minor	wild Canterbury bells		
Phacelia ramosissima	branching phacelia		FACU
CACTACEAE–CACTUS FAMILY			
Opuntia ×vaseyi	Vasey's prickly pear		
Opuntia littoralis	coastal prickly pear		
CAPRIFOLIACEAE–HONEYSUCKLE FAMILY			
Lonicera subspicata var. *denudata*	Johnston's honeysuckle		
CARYOPHYLLACEAE–PINK FAMILY			
Silene laciniata	cardinal catchfly		
CONVOLVULACEAE–MORNING-GLORY FAMILY			
Calystegia macrostegia	coast morning-glory		
CRASSULACEAE–STONECROP FAMILY			
Dudleya lanceolata	lance-leaved dudleya		
CUCURBITACEAE–GOURD FAMILY			
Marah macrocarpa	large fruit wild cucumber		
EUPHORBIACEAE–SPURGE FAMILY			
Euphorbia polycarpa	many seed spurge		
FABACEAE–LEGUME FAMILY			
Acmispon brachycarpus	short fruit deervetch		
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 leaf lupine		

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (134 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
Lupinus succulentus	arroyo lupine		
Lupinus truncatus	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*	little graceful golden currant		FAC
Ribes californicum	hillside gooseberry		
LAMIACEAE–MINT FAMILY			
Salvia apiana	white sage		
Salvia columbariae	chia		
Salvia mellifera	black sage		
Stachys bullata	California hedgenettle		
LOASACEAE–BLAZING STAR FAMILY			
Mentzelia laevicaulis	smooth stem blazing star		
LYTHRACEAE–LOOSESTRIFE FAMILY			
Ammannia coccinea	scarlet ammania		OBL
NYCTAGINACEAE–FOUR O'CLOCK FAMILY			
Mirabilis laevis var. *crassifolia*	coastal wishbone plant		
ONAGRACEAE–EVENING PRIMROSE FAMILY			
Camissoniopsis hirtella	hairy suncup		
Clarkia dudleyana	Dudley's clarkia		
Clarkia purpurea ssp. *quadrivulnera*	four-spot		
Epilobium brachycarpum	tall annual willowherb		
Epilobium canum ssp. *canum*	California fuchsia		
Epilobium ciliatum ssp. *ciliatum*	fringed willowherb		FACW
Eulobus californicus	false-mustard		
Oenothera elata ssp. *hirsutissima*	great marsh evening primrose		FACW
OXALIDACEAE–OXALIS FAMILY			
Oxalis californica	California wood-sorrel		
PAPAVERACEAE–POPPY FAMILY			
Eschscholzia californica	California poppy		
PHRYMACEAE–LOPSEED FAMILY			
Mimulus aurantiacus var. *pubescens*	hairy bush monkeyflower		FACU
Mimulus cardinalis	scarlet monkeyflower		FACW
Mimulus guttatus	seep monkeyflower		OBL
PLANTAGINACEAE–PLANTAIN FAMILY			
Keckiella cordifolia	heartleaf bush penstemon		
Penstemon spectabilis var. *spectabilis*	showy beardtongue		
Penstemon spectabilis var. *subviscosus*	glandular showy beardtongue		

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (134 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
PLATANACEAE–SYCAMORE FAMILY			
Platanus racemosa	western sycamore		FAC
POLEMONIACEAE–PHLOX FAMILY			
Linanthus californicus	prickly phlox		
POLYGONACEAE–BUCKWHEAT FAMILY			
Eriogonum elongatum var. *elongatum*	longstem buckwheat		
Eriogonum fasciculatum var. *foliolosum*	leafy California buckwheat		
Persicaria lapathifolia	willow smartweed		FACW
RANUNCULACEAE–BUTTERCUP FAMILY			
Clematis lasiantha	chaparral clematis		
Delphinium cardinale	scarlet larkspur		
RHAMNACEAE–BUCKTHORN FAMILY			
Ceanothus leucodermis	chaparral whitethorn		
Ceanothus oliganthus	hairy ceanothus		
Frangula californica ssp. *californica*	California coffeeberry		
Rhamnus ilicifolia	hollyleaf redberry		
ROSACEAE–ROSE FAMILY			
Cercocarpus betuloides var. *betuloides*	birch-leaf mountain mahogany		
Heteromeles arbutifolia	toyon		
Prunus ilicifolia ssp. *ilicifolia*	holly leaf cherry		
Rubus ursinus	California blackberry		FAC
RUBIACEAE–COFFEE FAMILY			
Galium angustifolium ssp. *angustifolium*	narrow leaved bedstraw		
Galium aparine	common bedstraw		FACU
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	white nightshade		FACU
Solanum douglasii	Douglas' nightshade		FAC
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	chaparral yucca		
CYPERACEAE–SEDGE FAMILY			
Cyperus eragrostis	tall flatsedge		FACW

NATIVE PLANT COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (134 Native Plant Species)		Special Status	Wetland Rank
Scientific Name	**Common Name**		
JUNCACEAE–RUSH FAMILY			
Juncus rugulosus	wrinkled rush		OBL
Juncus textilis	basket rush		FACW
Juncus xiphioides	iris leaved rush		OBL
POACEAE–GRASS FAMILY			
Elymus condensatus	giant wildrye		FACU
Eragrostis mexicana ssp. *virescens*	Chilean love grass		FACU
Festuca microstachys	Pacific fescue		
Leptochloa fusca	bearded sprangletop		
Melica imperfecta	little California melica		
Stipa coronata	crested needle grass		
Stipa lepida	foothill needle grass		
TYPHACEAE–CATTAIL FAMILY			
Typha domingensis	southern cattail		OBL

USFWS: U.S. Fish and Wildlife Service; CDFW: California Department of Fish and Wildlife; CRPR: California Rare Plant Rank; Cal-IPC: California Invasive Plant Council

LEGEND:

* = Non-native species
cf. = appears similar to, species cannot be confirmed 100% due to phenological condition

Special Status:

Federal (USFWS):
FE = Endangered
FT = Threatened

State (CDFW):
SE = Endangered
ST = Threatened
SR = Rare

CRPR – California Rare Plant Rank

1A. Presumed extirpated in California and either rare or extinct elsewhere
1B. Rare, Threatened, or Endangered in California and elsewhere
2A. Presumed extirpated in California, but more common elsewhere
2B. Rare, Threatened, or Endangered in California, but more common elsewhere
3. Plants about which we need more information - a review list
4. Plants of limited distribution - a watch list

Threat Code Extensions

None Plants lacking any threat information
.1 Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 Moderately threatened in California (20–80% of occurrences threatened/moderate degree and immediacy of threat)
.3 Not very threatened in California (<20% of occurrences threatened/low degree and immediacy of threat or no current threats known)
Special status designations updated on 12/21/2014

ATTACHMENT D

WILDLIFE COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

WILDLIFE COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (Vertebrates): 93 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	Cumulative
AMPHIBIANS							
***AMPHIBIA*–AMPHIBIANS**							
HYLIDAE–TREEFROGS							
Pseudacris hypochondriaca	Baja California treefrog				X	X	X
***LEPIDOSAURIA*–LIZARDS AND SNAKES**							
PHRYNOSOMATIDAE–SPINY LIZARDS							
Sceloporus occidentalis	western fence lizard		X	X	X	X	X
Uta stansburiana	common side-blotched lizard		X	X	X	X	X
TEIIDAE–WHIPTAIL LIZARDS							
Aspidoscelis tigris	tiger whiptail		X	X	X	X	X
COLUBRIDAE–COLUBRID SNAKES							
Masticophis lateralis	striped racer			X	X	X	X
Mastocophis flagellum	red coachwhip					X	X
Pituophis catenifer	gophersnake					X	X
VIPERIDAE–VIPERS AND PITVIPERS							
Crotalus oreganus	western rattlesnake				X	X	X
BIRDS							
***AVES*–BIRDS**							
ANATIDAE–SWAN, GOOSE, AND DUCK FAMILY							
Branta canadensis	Canada goose				X		X
ODONTOPHORIDAE–NEW WORLD QUAIL FAMILY							
Callipepla californica	California quail			X	X	X	X
ARDEIDAE–HERONS							
Ardea herodias	great blue heron				X		X
CATHARTIDAE–NEW WORLD VULTURES							
Cathartes aura	turkey vulture			X	X	X	X
ACCIPITRIDAE–HAWKS, KITES, EAGLES, AND ALLIES							
Accipiter cooperii	Cooper's hawk		X	X	X	X	X
Buteo jamaicensis	red-tailed hawk		X	X	X	X	X
CHARADRIIDAE–PLOVERS							
Charadrius vociferus	killdeer		X	X[b]	X	X	X

WILDLIFE COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (Vertebrates): 93 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	Cumulative
COLUMBIDAE–PIGEONS AND DOVES							
Patagoienas fasciata	band-tailed pigeon				X	X	X
Streptopelia decaocto[a]	Eurasian collared-dove				X		X
Zenaida macroura	mourning dove		X	X	X	X	X
APODIDAE–SWIFTS							
Aeronautes saxatalis	white-throated swift			X	X	X	X
TROCHILIDAE–HUMMINGBIRDS							
Archilochus alexandri	black-chinned hummingbird				X		X
Calypte anna	Anna's hummingbird		X	X	X	X	X
Calypte costae	Costa's hummingbird				X		X
Selasphorus rufus	rufous hummingbird				X	X	X
Selasphorus sasin	Allen's hummingbird		X	X	X	X	X
Selasphorus sp.	Allen's/rufous hummingbird			X	X	X	X
PICIDAE–WOODPECKERS							
Melanerpes lewis	Lewis's woodpecker		X	X			X
Melanerpes formicivorus	acorn woodpecker			X[b]	X[b]	X[b]	X
Picoides nuttallii	Nuttall's woodpecker				X	X	X
Picoides pubescens	downy woodpecker				X		X
Colaptes auratus	northern flicker			X	X	X	X
FALCONIDAE–FALCONS							
Falco sparverius	American kestrel			X	X	X	X
Falco columbarius	merlin			X			X
PSITTACIDAE–PARROTS							
Amazona viridigenalis[a]	red-crowned parrot				X	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
Sayornis nigricans	black phoebe		X	X	X	X	X
Sayornis saya	Say's phoebe			X	X		X
Myiarchus cinerascens	ash-throated flycatcher			X	X	X	X
Tyrannus vociferans	Cassin's kingbird			X	X	X	X

WILDLIFE COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (Vertebrates): 93 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	Cumulative
Tyrannus verticalis	western kingbird			X	X		X
VIREONIDAE–VIREOS							
Vireo gilvus	warbling vireo				X		X
CORVIDAE–JAYS AND CROWS							
Aphelocoma californica	California scrub-jay		X	X	X	X	X
Corvus brachyrhynchos	American crow				X		X
Corvus corax	common raven		X	X	X	X	X
HIRUNDINIDAE–SWALLOWS							
Stelgidopteryx serripennis	northern rough-winged swallow			X	X	X	X
Hirundo rustica	barn swallow				X	X	X
AEGITHALIDAE–BUSHTITS							
Psaltriparus minimus	bushtit		X	X	X	X[b]	X
TROGLODYTIDAE–WRENS							
Salpinctes obsoletus	rock wren			X	X	X	X
Catherpes mexicanus	canyon wren			X			X
Troglodytes aedon	house wren		X	X	X	X	X
Thryomanes bewickii	Bewick's wren		X	X	X	X	X
POLIOPTILIDAE–GNATCATCHERS AND GNATWRENS							
Polioptila caerulea	blue-gray gnatcatcher			X			X
REGULIDAE–KINGLETS							
Regulus calendula	ruby-crowned kinglet			X	X		X
SYLVIIDAE–SYLVIID WARBLERS							
Chamaea fasciata	wrentit			X	X	X	X
TURDIDAE–THRUSHES AND ROBINS							
Sialia mexicana	western bluebird			X	X	X	X
Catharus guttatus	hermit thrush				X	X	X
Turdus migratorius	American robin			X	X	X	X
MIMIDAE–THRASHERS							
Toxostoma redivivum	California thrasher					X	X
Mimus polyglottos	northern mockingbird		X	X	X	X	X
STURNIDAE–STARLINGS							
Sturnus vulgaris[a]	European starling				X		X

WILDLIFE COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (Vertebrates): 93 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	Cumulative
MOTACILLIDAE–PIPITS							
Anthus rubescens	American pipit		X				X
BOMBYCILLIDAE–WAXWINGS							
Bombycilla cedrorum	cedar waxwing				X	X	X
PTILOGONATIDAE–SILKY-FLYCATCHERS							
Phainopepla nitens	phainopepla			X		X	X
PARULIDAE–WOOD-WARBLERS							
Oreothlypis celata	orange-crowned warbler				X	X	X
Oreothlypis ruficapilla	Nashville warbler					X	X
Geothlypis tolmiei	MacGillivray's warbler				X		X
Geothlypis trichas	common yellowthroat		X	X[b]			X
Setophaga petechia	yellow warbler				X		X
Setophaga coronata	yellow-rumped warbler		X	X	X	X	X
Setophaga occidentalis	hermit warbler				X		X
Cardellina pusilla	Wilson’s warbler				X	X	X
EMBERIZIDAE–SPARROWS							
Pipilo maculatus	spotted towhee		X	X	X	X	X
Aimophila ruficeps	rufous-crowned sparrow			X		X	X
Melozone crissalis	California towhee		X	X	X	X[b]	X
Chondestes grammacus	lark sparrow				X	X	X
Melospiza melodia	song sparrow		X	X	X	X	X
Melospiza lincolnii	Lincoln’s sparrow			X		X	X
Zonotrichia leucophrys	white-crowned sparrow		X	X	X	X	X
Zonotrichia atricapilla	golden-crowned sparrow					X	X
Junco hyemalis	dark-eyed junco				X	X	X
CARDINALIDAE–CARDINALS, GROSBEAKS, AND ALLIES							
Piranga ludoviciana	western tanager				X		X
Pheucticus melanocephalus	black-headed grosbeak			X			
Passerina caerulea	blue grosbeak				X		X
Passerina amoena	lazuli bunting				X		X
ICTERIDAE–BLACKBIRDS							
Sturnella neglecta	western meadowlark			X			X

WILDLIFE COMPENDIUM (SEPTEMBER 2013–DECEMBER 2016)

Species (Vertebrates): 93 Total Native Species (Cumulative)		Special Status	2013	2014	2015	2016	Cumulative
Molothrus ater	brown-headed cowbird				X		X
Icterus cucullatus	hooded oriole			X	X	X	X
Icterus bullockii	Bullock's oriole			X	X	X	X
FRINGILLIDAE–FINCHES							
Carpodacus mexicanus	house finch		X	X	X	X	X
Carduelis pinus	pine siskin				X		X
Carduelis psaltria	lesser goldfinch		X	X	X	X	X
Carduelis lawrencei	Lawrence's goldfinch				X		X
Carduelis tristis	American goldfinch			X	X		X
PASSERIDAE–OLD WORLD SPARROWS							
Passer domesticus[a]	house sparrow				X		X
ESTRILDIDAE–WAXBILLS AND MANNIKINS							
Lonchura punctulata[a]	nutmeg mannikin		X	X		X	X
MAMMALS							
***MAMMALIA*–MAMMALS**							
SCIURIDAE–SQUIRRELS							
Otospermophilus beecheyi	California ground squirrel			X	X	X	X
CANIDAE–DOGS, WOLVES, FOXES							
Canis latrans	coyote				X	X	X
Urocyon cinereoargenteus	common gray fox					X	X
URSIDAE–BEARS							
Ursus americanus[c]	black bear			X		X	X
MEPHITIDAE–SKUNKS							
Mephitis mephitis	striped skunk					X	X
CERVIDAE–DEER							
Odocoileus hemionus	southern mule deer		X	X	X	X	X
Total Native Vertebrate Species Observed			**27**	**56**	**77**	**65**	**95**

[a] Non-native species.
[b] Species observed nesting on the site.
[c] Species native to the State of California but introduced to the local habitat area.