

FIRST ANNUAL MONITORING REPORT
for the
ALTA LA JOLLA DRIVE
DRAINAGE REPAIR PROJECT, PHASE 2

(ACOE 404 SPL-2010-00157-RRS; CDFW SAA #1600-2010-0053-R5; RWQCB 401 #10C-033)

Prepared for:

The City of San Diego

Engineering and Capital Projects
525 B Street, Suite 750, MS 908A
San Diego, California 92101-4502

Prepared by:

DUDEK

605 Third Street
Encinitas, California 92024

In collaboration with

Habitat Restoration Sciences, Inc. (HRS)



Contacts:

Andy Thomson – Restoration Ecologist (Dudek)
Kyle Matthews – Landscape Contractor C-27 # 842661 (HRS)
760.942.5147 (Dudek)
760.479.4210 (HRS)

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SUMMARY

This report summarizes the first year (August 2016–August 2017) of habitat restoration work and monitoring results for the Alta La Jolla Drive Drainage Repair Project, Phase 2 (Restoration Project).

In April 2016, Habitat Restoration Sciences, Inc. (HRS) and Pacific Rim (both as subcontractors to KTA) completed the installation of the habitat restoration component of the project, which included installing an irrigation system, planting container plants, and seeding with native species. The 120-day plant establishment period (PEP) was completed on August 4, 2016, marking the start of the Year 1 monitoring period. Since this time, HRS has conducted regular maintenance visits to control non-native plant species, remove trash and debris, and adjust and augment the irrigation system. Rincon Consultants, Inc. provided biological monitoring during installation and through the 120-day monitoring period. Upon completion of the PEP period, Dudek resumed the responsibilities of biological monitoring of the Restoration Project. The timeline for monitoring the Restoration Project is provided in Table 1.

The Restoration Project is divided into four restoration area categories: drainage channel (0.35 acres), upland (2.57 acres), erosion control (steep slopes, detention basin, maintenance roads, disturbed areas), and off-site pampas grass (*Cortaderia selloana*) removal areas. Each area has specific success criteria and maintenance actions. The erosion control areas were planted and hydroseeded for the purpose of erosion control and are not required for mitigation. The off-site pampas grass removal area is located within Kate O. Sessions Memorial Park and designated to mitigate linear footage impacts to the drainage resulting from the drainage repair project as required by the Regional Water Quality Control Board (RWQCB) and Army Corps of Engineers (ACOE). The first year performance of the Restoration Project was assessed utilizing qualitative and quantitative data. Qualitative assessments were conducted on December 1, 2016, January 25, and August 8, 2017. Quantitative transect data was collected on June 2, 2017. Target non-native species were regularly controlled by HRS throughout the first year of the restoration program, maintaining a low weed presence on site.

Based on the positive results from the first year monitoring of the Restoration Project, the site is on track to meet the final success criteria as planned. The restored drainage channel mitigation area is meeting first year success criteria for both native and non-native cover with 77% cover of native plants, 0% cover of perennial invasive plants, and 1.5% cover of annual invasive plants. It is not meeting the first year success criteria of 90% survival for container plants with a 60% survival rate. However, seeded species have filled in and overall native cover is excellent for this stage of the program. Additionally, replacement container plants have been recommended for installation in winter 2017–18.

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The upland mitigation area is meeting first year success criteria for container plant survival, native plant cover, annual invasive species cover, and erosion control goals with a 70% survival of container plants, 74% native plant cover, 6% cover of annual invasive plants, and no erosion issues. It is not meeting success criteria of zero percent cover of perennial invasive plants with <1% cover due to the presence of a few invasive plants that had not yet been controlled when the annual data was collected.

On average, the erosion control areas are meeting first year assessment criteria for plant cover with an average of approximately 80% overall cover. However, the erosion control areas are slightly below first year assessment criteria of zero percent cover of perennial invasive plants with approximately 3–6% cover of perennial invasive plants.

The pampas grass control efforts at the off-site Kate O. Sessions Memorial Park have been effective at controlling this invasive species. A follow-up visit in 2017 confirmed that with the exception of a few plants, the original pampas grass control effort conducted in 2016 was effective. The few plants that were still alive during the 2017 visit were controlled. A second follow-up visit will be conducted in spring or summer 2018.

Overall, native cover goals were met in all project areas, with excellent plant establishment and species richness. Container plant survival goals were met in most areas, but will require a few replacement plants in the riparian habitat. Perennial invasive species presence was slightly above the zero percent cover target in some areas, but should be achieved in the second year with continued maintenance efforts as planned.

Table 1
Monitoring Time Line

Year	J	F	M	A	M	J	J	A	S	O	N	D
2016								S	—	—	—	M
2017	M	M	—	P	—	Q	—	M	—	R	—	—
2018	—	M	—	—	Q	—	—	—	—	R	—	—
2019	—	M	—	—	Q	—	—	—	—	R	—	—
2020	—	M	—	—	Q	—	—	—	—	R	—	—
2021	—	M	—	—	Q	—	—	C	—	R		

Notes:

- S = Completion of the 120-day Plant Establishment Period and Start of the 5-Year Maintenance and Monitoring Period
- M = Qualitative Biological Monitoring
- Q = Annual Quantitative Monitoring
- P = Semi-annual Progress Report Due (Year 1 Only)
- R = Annual Report Due
- C = Scheduled Completion of the 5-Year Maintenance and Monitoring Period
- = Monitoring Work Completed to Date

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1 PROJECT INFORMATION

The Alta La Jolla Drive Drainage Repair Project, Phase 2 (Restoration Project) is intended to compensate for direct impacts to jurisdictional waters and wetlands and coastal sage scrub (CSS) habitat resulting from the implementation of the drainage repair project. The Restoration Project is located south of Alta La Jolla Drive and north of Vicki Drive, in Lot 1, Unit 15 of the La Jolla Alta Planned Residential Development, in the community of La Jolla in the City of San Diego, San Diego County, California. The project site is located on the *La Jolla, California* United States Geological Survey (USGS) 7.5 minute quadrangle map in Section 36, Township 18 South and Range 4 West, San Bernardino Base and Meridian (Figure 1). The Restoration Project was implemented in accordance with the Alta La Jolla Drive Drainage Repair Project, Phase 2 Compensatory Mitigation and Monitoring Plan (CMMP; Rocks Biological Consulting, 2015).

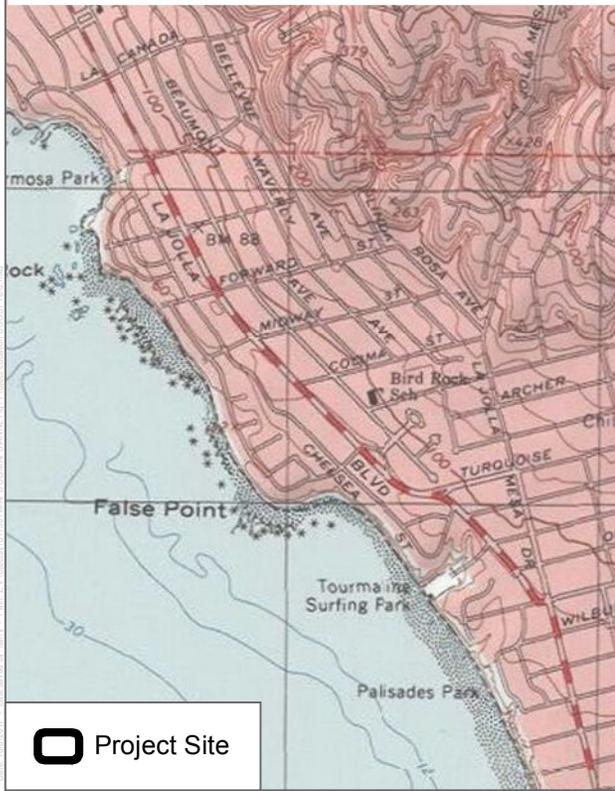
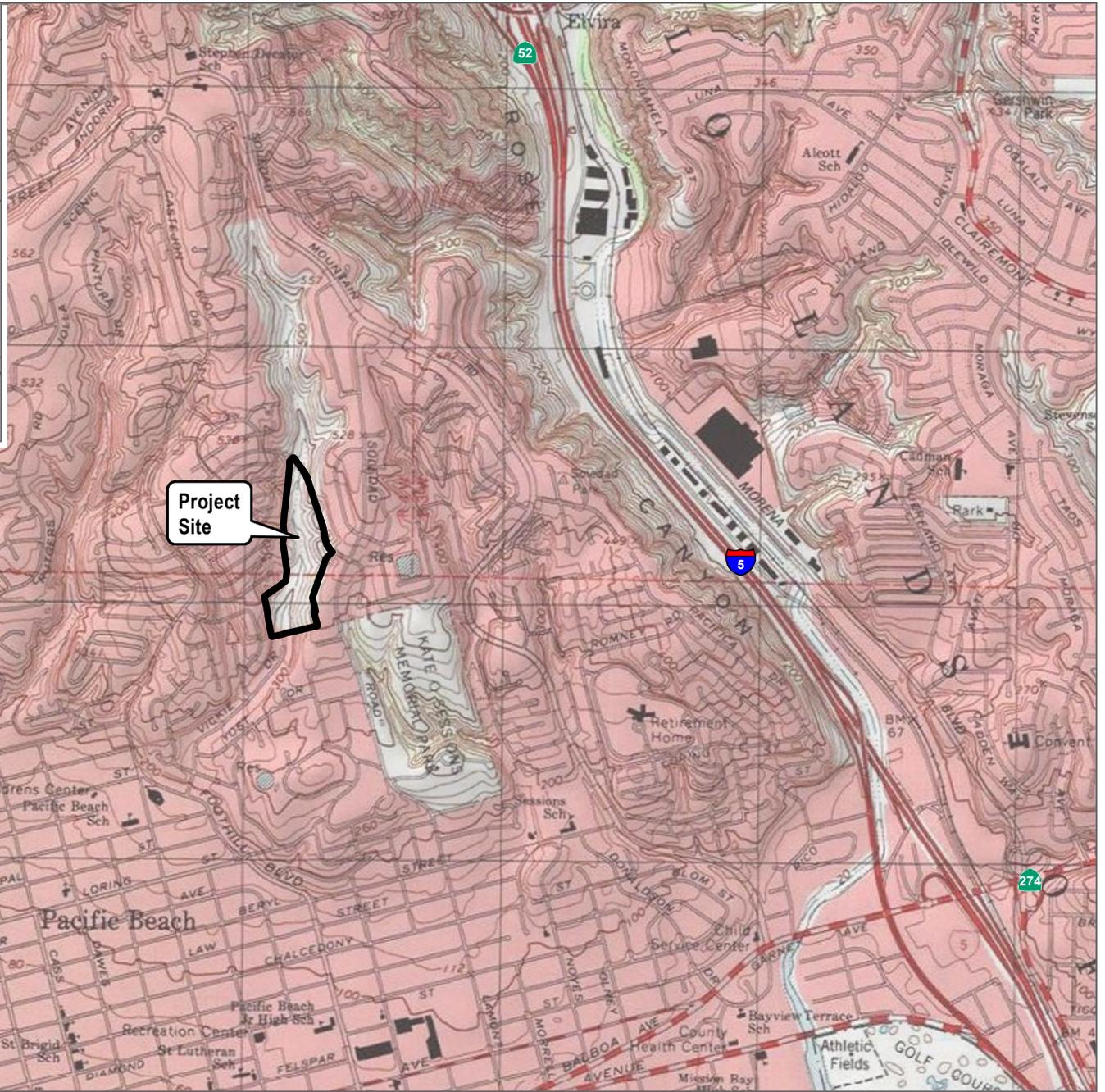
This document is intended to satisfy the requirements of the Restoration Project in accordance with the *United States Army Corps of Engineers (ACOE) Clean Water Act Section 404 Permit, California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement No. 1600-2010-0053-R5, and Regional Water Quality Control Board (RWQCB) Clean Water Act Section 401 Water Quality Certification No. 10C-033*. The project is consistent with the requirements set forth in *Element IV (B) 1-6 of the City of San Diego Site Development Permit for the Alta La Jolla Drainage Repair Phase 2 Project (Project No. 12871)*.

The primary goal of the Restoration Project is to successfully establish 2.57 acres of upland habitat as well as 0.35 acres of jurisdictional waters and wetlands habitat to mitigate for impacts associated with the Alta La Jolla Drainage Repair Project, Phase 2. The biological monitoring work for the project is being implemented in accordance with the Alta La Jolla Drive Drainage Repair Project, Phase 2 Compensatory Mitigation and Monitoring Plan (CMMP; Rocks Biological Consulting, 2015).

The project area is comprised of approximately 7.9 acres of open space, including Diegan Coastal Sage Scrub and Non-native Grassland habitats (Figure 2). The federally listed threatened Coastal California Gnatcatcher (*Polioptila californica californica*) has also been documented to occur on site. There is an ephemeral drainage channel bisecting the site from north to south, which receives water from two storm drains that flow west to east and one storm drain flowing east to west. This channel drains into a 48-inch culvert at the southern end of the project site boundary. Phase 1 of the project included the construction to stabilize the northwestern canyon slope and to divert runoff from the three storm drain outlets into three constructed storm drainpipes. Phase 2 was the finalization of the drainage repairs and restoration of the site.

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Dudek is providing the long-term biological monitoring services. The Dudek representative for the project is Andy Thomson (Biologist/Restoration Ecologist). Habitat Restoration Sciences, Inc. (HRS) is providing installation and maintenance services. The representative for the project at HRS is Kyle Matthews (Landscape Contractor).



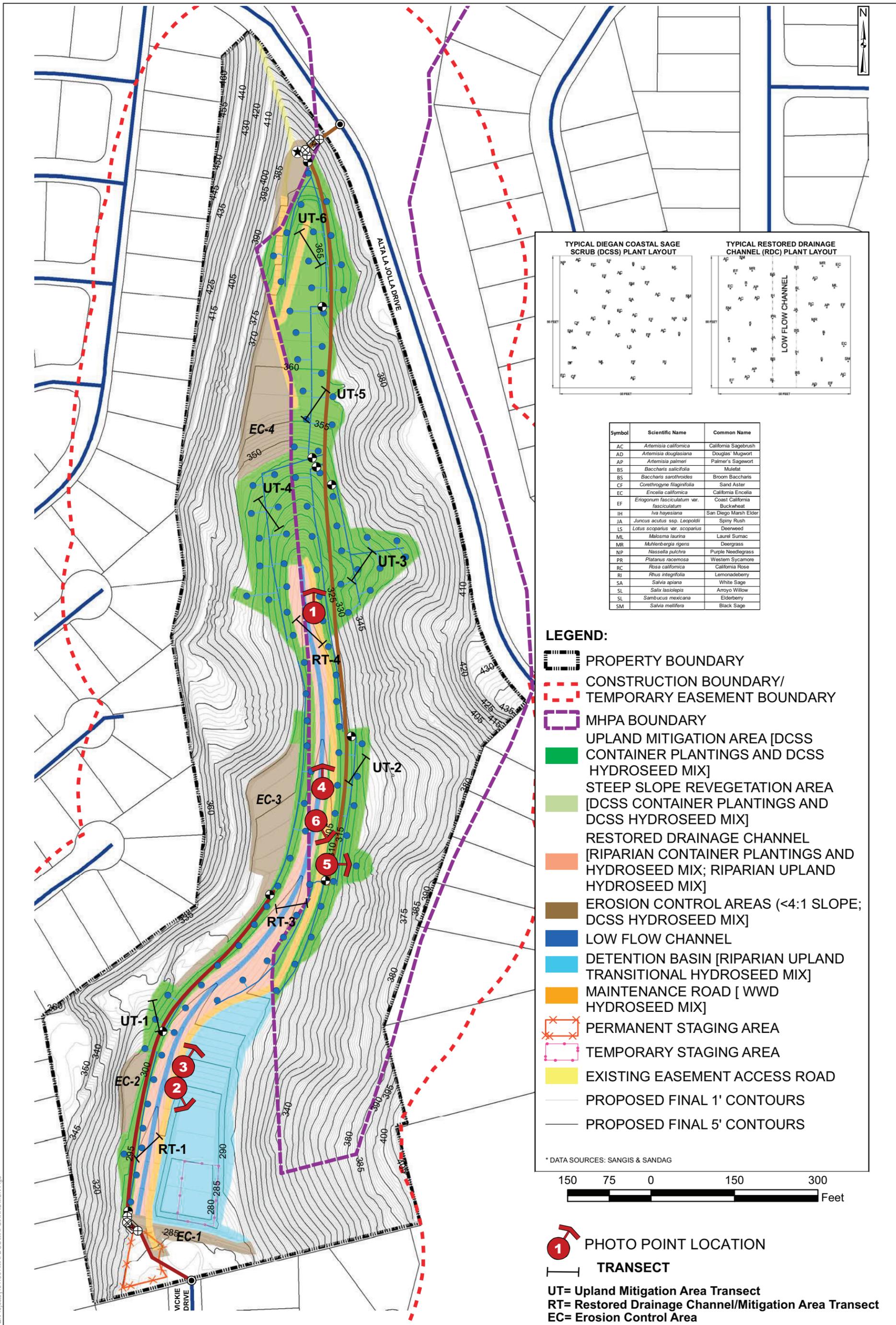
SOURCE: USGS 7.5-Minute Series Newport Beach Quadrangle



FIGURE 1
Project Location

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SOURCE: ROCKS BIOLOGICAL CONSULTING

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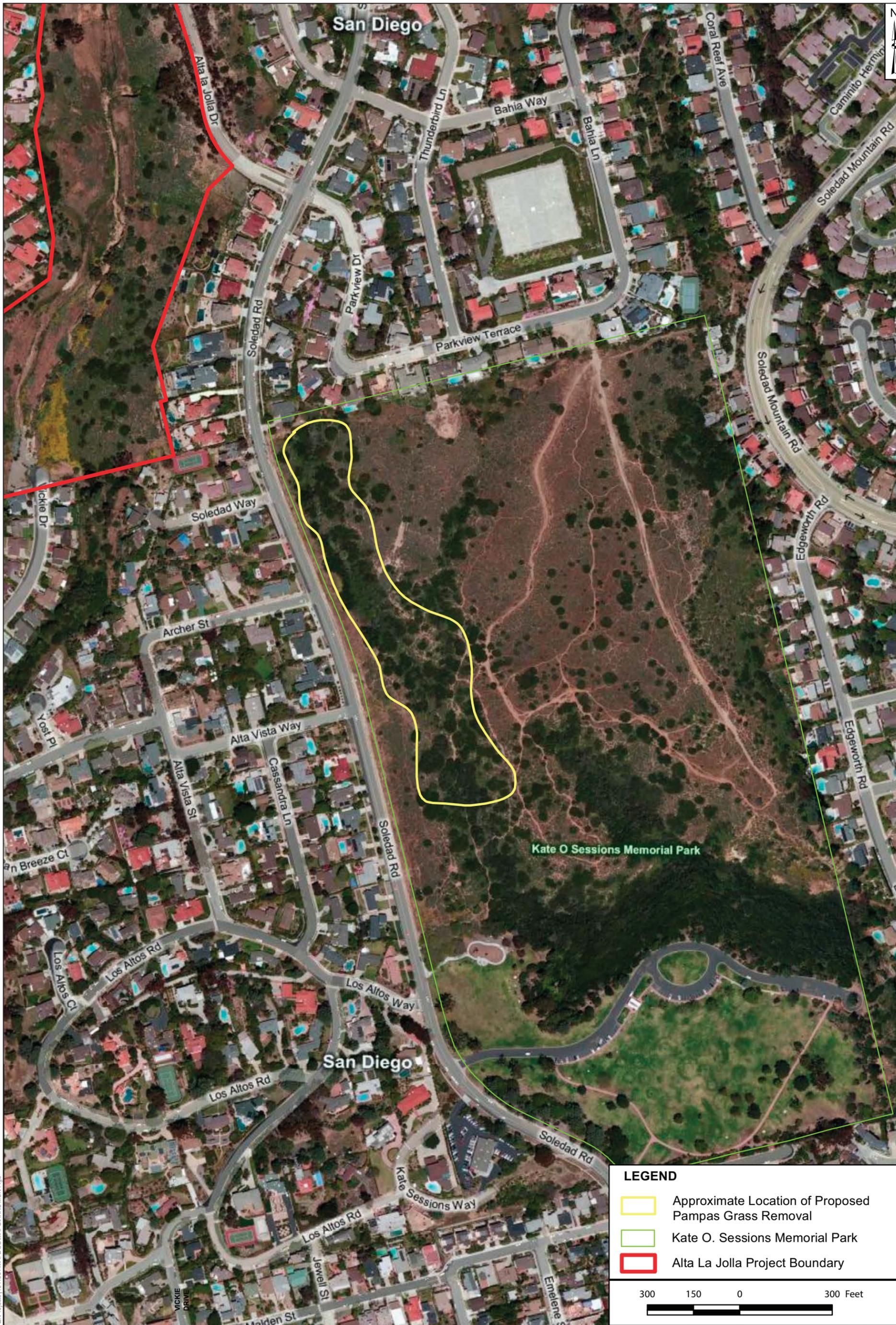
2 SUMMARY OF MAINTENANCE AND REMEDIAL ACTIONS

Maintenance and remedial actions implemented in 2016–2017 included weed control, pampas grass removal, irrigation maintenance, and trash and debris removal. Each of these maintenance items is discussed in more detail below:

- Weed control was conducted by HRS on June 8–9 and 22–23, July 6 and 20, August 3, 26, September 22, October 12, November 10 and 29, December 29 of 2016 and January 10, February 24, March 20, April 27, June 9 of 2017. Weed control efforts consisted of spot spraying and were focused on controlling non-native invasive plant species, with a particular emphasis on controlling weeds prior to seed set. The most predominant weeds on site were lamb quarters (*Chenopodium album*), mustard (*Brassica* spp.), crystalline ice plant (*Mesembryanthemum crystallinum*), sow thistle (*Sonchus oleraceus*), sourclover (*Melilotus indicus*), Russian thistle (*Salsola tragus*), tree tobacco (*Nicotiana glauca*), onion weed (*Asphodelus fistulosus*), London rocket (*Sisymbrium irio*), and annual nonnative grasses (*Bromus* spp., *Avena* spp., *Festuca myuros*).
- A follow-up control effort for pampas grass took place on August 21, 2017 at the off-site mitigation site located within Kate O. Sessions Memorial Park (Figure 3). The original pampas grass control effort was conducted in 2016. HRS located and treated only a few individuals within the area that were re-sprouts from plants previously treated.
- Irrigation maintenance took place on June 2, August 3, November 29, and December 29, 2016. Maintenance activities included fixing leaks, cleaning clogged sprinkler heads, adding irrigation heads, and adjusting timers.
- Trash and debris were kept under control by HRS during the regular maintenance visits. In response to heavier trash and debris build up by the gate at the western end, clearing efforts focused on this area on February 24 and March 20, 2017.

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3 MONITORING DATA AND DISCUSSION OF RESULTS

In this section, monitoring data is compared to the performance standards established for the project and discussed relative to achievement of the project goals. Success criteria are outlined in Tables 2–4.

Table 2
Restored Drainage Channel Mitigation Success Criteria

Milestone	Assessment Criteria
120 Days	Planting and hydroseeding to achieve 50% overall cover and 90% survivorship container plantings (excluding main channel area†)
	0% cover of perennial invasive species
	No more than 25% cover of annual invasive plants
1 Year	90% survival of container plants
	Native plant cover of at least 40% (excluding main channel area†)
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
2 Years	Native plant cover of at least 50% (excluding main channel area†)
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
3 Years	Native plant cover of at least 60% (excluding main channel area†)
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
4 Years	Native plant cover of at least 60% (excluding main channel area†)
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
5 Years	Native plant cover of at least 80% (excluding natural openings within main channel area†)
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants

† The main stream channel area is expected to lack dense vegetative cover due to the cobbly substrate, stream meander, and erosive force of water that may preclude dense vegetation from establishing in this area (similar to nearby natural streams). As such, a quantitative assessment criterion for native cover is not appropriate for this area. However, the invasive species cover criteria still apply.

Table 3
Upland Mitigation Success Criteria and Monitoring Results

Milestone	Assessment Criteria
120 Days	Planting and hydroseeding to achieve 50% overall cover and 90% survivorship container plantings (excluding main channel area†)
	0% cover of perennial invasive species
	No more than 25% cover of annual invasive plants

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Table 3
Upland Mitigation Success Criteria and Monitoring Results

Milestone	Assessment Criteria
1 Year	70% survival of container plants
	Native plant cover of at least 30%
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
	Minimize erosion
2 Years	Native plant cover of 40%
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
	Minimize erosion
3 Years	Native plant cover of 60%
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
	All planting should be completed; irrigation terminated at end of year 3, if practicable
	Minimize erosion
4 Years	Native plant cover of at least 70%
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants
	Minimize erosion
5 Years	Native plant cover of at least 80%
	0% cover of perennial invasive plants
	No more than 20% cover of annual invasive plants

Table 4
**Steep Slope Erosion control Areas and Areas receiving Erosion Control Hydroseed
(Detention Basin, Maintenance roads, disturbed Areas) Success Criteria**

Milestone	Assessment Criteria
120 Days	Plant cover of approximately 50% (visual estimate by restoration biologist)
	0% cover of perennial invasive species
1 Year	Plant cover of approximately 80% (visual estimate by restoration biologist)
	0% cover of perennial invasive plants
25 Months	Plant cover of approximately 100% (visual estimate by restoration biologist)
	0% cover of perennial invasive plants

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3.1 Monitoring Methods

The primary purpose of monitoring visits was to determine the status of the restoration relative to project goals. Biological monitoring consisted of both qualitative monitoring and quantitative monitoring. Qualitative monitoring consisted of evaluating native plant vigor and development, seedling recruitment from native seed application, container plant health, soil moisture content, presence/absence of plant pests or diseases, erosion and/or drainage conditions on site, presence/absence of non-native or invasive plant species, trash or debris accumulation, wildlife presence/absence, and silt fence condition/function. In order to document current site conditions, photographs were taken at designated photo points (Appendix A). Dudek restoration specialists conducted quantitative monitoring in June 2017. During this assessment, overall and relative percent plant cover estimates were evaluated using 10 representative transects within restoration areas that received container plantings. The point-intercept method was used to count and identify plant species every 0.5 meter along 25 meter transects (Appendix B).

Transect measurements are not required by the Restoration Plan in the erosion control areas which received only hydroseed (Appendix B). Therefore, vegetative cover was measured visually using the CNPS relevé method (CNPS 2007). Based on this method, species cover was categorized with the associated class breakdown:

- Class 1: <1% cover
- Class 2: 1–5% cover
- Class 3a: 5–15% cover
- Class 3b: 15–25% cover
- Class 4: 25–50% cover
- Class 5: 50–75% cover
- Class 6: >75% cover

In order to assess the off-site mitigation area located at Kate O. Sessions Memorial Park, baseline surveys were conducted to observe individual pampas grass plants and document their locations for control. Photographs were taken at fixed photo points to document post treatment conditions. At the completion of the treatment in August of 2018, a final survey will be conducted and photographs taken at the designated photo points in order to confirm success of pampas grass control in the area.

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3.2 Monitoring Results Compared to Performance Standards

Mitigation monitoring results compared to the performance standards are provided in Tables 5 and 6, and performance standards for non-mitigation (i.e., erosion control) areas are shown in Table 7. Each restoration component has established success criteria. Upon completion of mitigation activities, the areas designated for mitigation have a final success criterion of greater than or equal to 80% cover of native species. Pursuant of the City of San Diego regulatory requirements, the project success criteria for erosion control areas is 100% coverage within 25 months of project completion.

The 2016–2017 monitoring results indicate that the mitigation areas are in substantial conformance with first year performance criteria, with a few minor deficiencies as outlined herein. Locations of the restoration sites are depicted in Figure 2. Photos of the restoration areas are provided in Appendix A.

3.2.1 Wetland/Riparian Mitigation Area

Based on the results of the 2016–2017 transect data collection, the restored drainage channel mitigation area is on track to meet the final success criteria upon completion of the 5-year monitoring program. The restored drainage channel is meeting first year success criteria for both native and non-native cover with 77% cover of native plants, 0% cover of perennial invasive plants, and 1.5% cover of annual invasive plants. It is not meeting the first year success criteria for container plant survival with a 60% survival rate.

Table 5
Restored Drainage Channel Mitigation Success Criteria and Monitoring Results

Milestone	2017 Monitoring Results	Year 1 Assessment Criteria	Status
1 Year	60% survival of container plants	90% survival of container plants	Not achieved
	Native plant cover of 77% (excluding main channel area†)	Native plant cover of at least 40% (excluding main channel area†)	Achieved
	0% cover of perennial invasive plants	0% cover of perennial invasive plants	Achieved
	1.5% cover of annual invasive plants	No more than 20% cover of annual invasive plants	Achieved

† The main stream channel area is expected to lack dense vegetative cover due to the cobbly substrate, stream meander, and erosive force of water that may preclude dense vegetation from establishing in this area (similar to nearby natural streams). As such, a quantitative assessment criterion for native cover is not appropriate for this area. However, the invasive species cover criteria still apply.

Predominant species occurring in the restored drainage channel and associated buffer habitat include purple needlegrass (*Stipa pulchra*, 59%), mule fat (*Baccharis salicifolia*, 28%), clustered tarweed (*Deinandra fasciculata*, 31%), and western ragweed (*Ambrosia psilostachya*, 19%).

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Container plants installed in the riparian mitigation area have primarily established well, particularly the transitional upland species where at least 90% survival rates were documented. However, riparian species planted from container plants have had higher rates of mortality, with approximately 70% survival. The majority of container plant mortality in this area has been replaced by natural recruitment of appropriate species, especially mule fat. There were no observed perennial invasive species within the transects and 1.5% cover of annual invasive species. However, perennial fennel (*Foeniculum vulgare*) was observed to occur sporadically in a few locations on site (outside of the transects).

3.2.2 Upland Mitigation

The upland mitigation area is meeting first year success criteria for container plant survival, native cover, and annual invasive cover (Table 6). It is also meeting the first year qualitative assessment criterion to “minimize erosion” (Table 7). It is not meeting success criteria for perennial invasive plant cover (Table 6).

Table 6
Quantitative Upland Mitigation Success Criteria and Monitoring Results

Milestone	Monitoring Results	Assessment Criteria	Status
1 Year	70% survival of container plants	70% survival of container plants	Achieved
	Native plant cover of 74%	Native plant cover of at least 30%	Achieved
	<1% cover of perennial invasive plants	0% cover of perennial invasive plants	Not Achieved
	6% cover of annual invasive plants	No more than 20% cover of annual invasive plants	Achieved

Table 7
Qualitative Upland Mitigation Success Criteria and Monitoring Results

Milestone	Monitoring Results	Assessment Criteria	Status
1 Year	No erosion issues detected	Minimize erosion	Achieved

The upland mitigation areas are meeting first year criteria with greater than 70% survival of container plants and 74% native plant cover. Predominant species within the upland mitigation areas include San Diego County viguiera (*Bahiopsis laciniata*, 83% cover), California goldfields (*Lasthenia californica*, 10% cover), purple needlegrass (27% cover), California poppy (*Eschscholzia californica*, 9% cover) and bush sunflower (*Encelia californica*, 9% cover).

There was one observed tobacco tree (*Nicotiana glauca*) within the transects, indicating that there is greater than 0% cover of perennial invasive species. There was 6% cover of annual

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invasive species observed on site, primarily consisting of non-native annual grasses. No erosion issues were detected within the mitigation area.

Coastal California gnatcatchers have been regularly observed by Dudek biologists within the Diegan coastal sage scrub upland mitigation area. While use or occupation of the habitat by gnatcatcher is not a requirement, their presence is a positive indicator that the target functions for wildlife habitat are developing as intended.

3.2.3 Erosion Control Areas

The erosion control areas consisting of the steep slopes and hydroseed areas (detention basin, maintenance roads, and disturbed areas) are meeting the first year performance criteria for plant cover (Table 8).

Table 8
Steep Slope Erosion Control Areas and Areas Receiving Erosion Control Hydroseed
(Detention Basin, Maintenance Roads, Disturbed Areas)
Success Criteria and Monitoring Results

Milestone	2017 Monitoring Results	Year 1 Assessment Criteria	Status
1 Year	Plant cover ranging from 50–95%, with an average of approximately 80% overall (visual estimate by restoration biologist)	Plant cover of approximately 80% (visual estimate by restoration biologist)	Achieved
	Approximately 3–5% cover of perennial invasive plants	0% cover of perennial invasive plants	Not achieved

Average total plant cover was observed to range from approximately 50–95% (Classes 5–6), with an overall average at approximately 80% (Class 6). There was an observed range of 3–5% cover (Class 2) of perennial invasive species within the erosion control areas, which exceeds the 0% performance criteria. The perennial invasive species observed within these areas included tree tobacco.

There is a portion of the canyon slope where native cover has been slower to develop. This area was tested and documented to have elevated saline content, causing stunted plant growth. This was remedied by adding a new irrigation head in order to leach salts from the soil and aid plant establishment. Due to observed improvements in plant establishment since this modification, no remedial actions are currently recommended but continued monitoring will occur.

The detention basin was monitored closely during the first year. This area was slow to establish due to the fact that it was seeded in the summer and was unirrigated. The frequent rainfall in late 2016 and early 2017 hastened vegetation growth and establishment, and the basin met the 120-

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day success criteria of 50% native cover in February. The detention basin is currently exhibiting 50–80% (Classes 5–6) vegetative cover, with an average of about 70%. Therefore, the average current conditions of the detention basin are not meeting the first year success criteria of 80% total cover. However, in accordance with the mitigation and monitoring plan (CMMP; Rocks Biological Consulting, 2015), City maintenance crews perform periodic pruning and removal of vegetation as well as dredging activities in order to allow drainage and functioning of the basin. Vegetative cover will consistently fall below the success criteria due to this periodic removal and trimming of vegetation. Despite the fact that the detention basin is not meeting first year success criteria, it is still performing the target functions of the basin.

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4 ACTION STRATEGY FOR 2017–2018

The primary focus of the maintenance and monitoring efforts during the second year of the maintenance program will be to control weeds in order to reduce competition and to encourage further establishment of native species.

Control Weeds: Weed control efforts have been very effective at keeping weeds under control. However, persistent weed control is recommended to maintain the project in conformance to annual performance criteria for weed cover, particularly as it relates to perennial invasive species such as tree tobacco. General weed control within the on-site coastal sage scrub habitat and the drainage channel should be continued through the second year. In addition, the on-site erosion control areas will require the control of perennial invasive species (e.g., tree tobacco and fennel). While largely under control, one additional treatment of pampas grass should be completed in 2018 at the off-site Kate O. Sessions Memorial Park within the two-year timeframe in accordance with the Restoration Plan. A combination of physical, cultural and herbicide treatments will likely be required to keep the weed species in check. It is critical that the methods of weed control employed do not result in impacts to the desirable native species. All weed/exotic debris will be removed from the site and disposed of in a timely and legal manner. All applicable laws, regulations, safety precautions, and label directions are followed when performing herbicide treatments. The landscape maintenance contractor (HRS) consults with their licensed Pest Control Adviser if specific herbicide/pest control recommendations are required.

1. **Remove Trash:** Trash removal should be conducted as necessary. Occurrence of trash has been minimal overall, but monitoring and maintenance efforts should be continued. Most of the trash observed on site has been associated with the drainage channel and detention basin.
2. **Supplemental Planting:** Container plant survival was below the first year success criteria within the riparian habitat area. While native cover is relatively high and the majority of the dead plants were replaced by natural recruitment, it is recommended that 90 additional plants be replaced in order to improve habitat structure and diversity throughout the riparian habitat adjacent to the channel (Table 9).

**Table 9
Container Plant Replacement**

Species	Common Name	Amount	Size
<i>Rosa californica</i>	California wild rose	10	1-gallon
<i>Iva hayesiana</i>	San Diego marsh elder	50	1-gallon
<i>Sambucus nigra</i> ssp. <i>caerulea</i>	Blue elderberry	30	1-gallon
Total		90	

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- 3. Remove Drainage Diversion Structure:** The drainage diversion at the central storm drain structure should be removed. However, the diversion structure should not be removed until the both the upstream and downstream channels are vegetated and stabilized. A large amount of sediment passed through the storm drain diversion structure and into the detention basin during the rainy season of 2016–17. The detention basin was effective at capturing and retaining the sediment. However, the amount of sediment in the runoff would have overwhelmed the restored drainage channel. Therefore, Dudek recommends monitoring additional sediment accretion in the detention basin during the first few significant rain events of 2017–18. If the sediment accretion in the detention basin is minimal (e.g., less than about two inches), the diversion structure should be removed to allow the restored drainage channel to convey storm flows. However, if the accretion levels continue to be high during the 2017–18 rainy season, the diversion structure should remain in place until it can be re-evaluated in the next rainy season. Dudek has placed measuring stakes within the detention basin in order to track sediment accretion and will notify the contractor if the diversion structure should be removed.

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5 REFERENCES

2016. *120-Day Monitoring Letter Report for the Alta La Jolla Drive Drainage Repair Project Phase 2 Project, San Diego, California*. Prepared for City of San Diego-Development Services Department. September.

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APPENDIX A
Representative Photographs



PRE-PROJECT

Photo Point 1: View north at future energy dissipater location. (October 20, 2015)



POST-PROJECT

Photo Point 1: View north at energy dissipater location. (June 2, 2017)

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SOURCE: RINCON 2015; DUDEK 2017



PRE-PROJECT

Photo Point 2: View south of future detention basin location. (October 20, 2015)



POST-PROJECT

Photo Point 2: View south of detention basin location. (June 2, 2017)

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SOURCE: RINCON 2015; DUDEK 2017



PRE-PROJECT
Photo Point 3: View northeast of future outlet to detention basin location.
(October 20, 2015)



POST-PROJECT
Photo Point 3: View northeast of outlet to detention basin location.
(June 2, 2017)

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SOURCE: RINCON 2015; DUDEK 2017



PRE-PROJECT

Photo Point 4: View north towards deep incision on eastern slope. (October 20, 2015)



POST-PROJECT

Photo Point 4: View north after removal of deep incision on eastern slope. (June 2, 2017)

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SOURCE: RINCON 2015; DUDEK 2017



POST-PROJECT
Photo Point 5: View looking east at eastern slope. (June 2, 2017)



POST-PROJECT
Photo Point 6: View looking southeast at eastern slope. (June 2, 2017)

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SOURCE: DUDEK 2017

DUDEK

APPENDIX B

Transect Data and Visual Cover Estimates

Steep Slope Erosion Control Areas and Areas Receiving Erosion Control Hydroseed (Detention Basin, Maintenance Roads, Disturbed Areas) Visual Cover Estimates

Scientific Name	Common Name	Life	Form	Native	Cal-IPC	EC 1 Class	EC 2 Class	EC 3 Class	EC 4 Class
<i>Ambrosia psilostachya</i>	Ragweed	perennial	herb	native	none	1			
<i>Artemisia californica</i>	Californica sagebrush	perennial	shrub	native	none	2	1	1	1
<i>Avena barbata</i>	Slender oat	annual	grass	non-native	moderate				3a
<i>Baccharis pilularis</i>	Coyote brush	perennial	shrub	native	none	1			
<i>Baccharis salicifolia</i>	Mule fat	perennial	shrub	native	none		1	2	
<i>Baccharis sarothroides</i>	Desertbroom baccharis	perennial	shrub	native	none	1			
<i>Bahiopsis laciniata</i>	San Diego county viguiera	perennial	shrub	native	none		3a	3b	3a
<i>Bromus diandrus</i>	Ripgut brome	annual	grass	non-native	moderate		1		
<i>Bromus madritensis</i>	Foxtail chess	annual	grass	non-native	none	1	1	2	1
<i>Conium maculatum</i>	Poison hemlock	biennial	herb	non-native	moderate	1			
<i>Cornus canadensis</i>	Bunch berry	perennial	herb	native	none	1		1	
<i>Datura wrightii</i>	Jimsonweed	perennial	herb	native	none		3b	1	1
<i>Deinandra fasciculata</i>	Clustered tarweed	annual	herb	native	none	3a			3b
<i>Encelia californica</i>	Bush sunflower	perennial	shrub	native	none		1		
<i>Erigeron bonariensis</i>	Flax-leaved horseweed	annual	herb	non-native	none			1	
<i>Erigeron canadensis</i>	Canada horseweed	annual	herb	native	none		3b		
<i>Eriogonum fasciculatum</i>	California buckwheat	perennial	shrub	native	none	1		1	
<i>Eschscholzia californica</i>	California poppy	annual	herb	native	none	1	2	2	1
<i>Festuca microstachys</i>	Small fescue	annual	grass	native	none			1	1
<i>Festuca myuros</i>	Rattail sixweeks grass	annual	grass	non-native	moderate	1	1	1	
<i>Glebionis coronaria</i>	Crown daisy	annual	herb	non-native	moderate	2			
<i>Isocoma menziesii</i>	Menzies' goldenbush	perennial	shrub	native	none		3b		
<i>Lasthenia californica</i>	California goldfields	annual	herb	native	none		3a		
<i>Lasthenia gracilis</i>	Needle goldfields	annual	herb	native	none				4
<i>Lupinus succulentus</i>	Arroyo lupine	annual	herb	native	none				3a
<i>Malacothamnus fasciculatus</i>	Chaparral bush mallow	perennial	shrub	native	none			1	
<i>Malacothamnus parishii</i>	Parish's bush mallow	perennial	shrub	native	none	1			
<i>Malva nicaeensis</i>	Bush mallow	annual	herb	non-native	none	1			
<i>Malva parviflora</i>	Cheeseweed	annual	herb	non-native	none		1	1	

Steep Slope Erosion Control Areas and Areas Receiving Erosion Control Hydroseed (Detention Basin, Maintenance Roads, Disturbed Areas) Visual Cover Estimates

Scientific Name	Common Name	Life	Form	Native	Cal-IPC	EC 1 Class	EC 2 Class	EC 3 Class	EC 4 Class
<i>Melilotus indicus</i>	Annual yellow sweetclover	annual	herb	non-native	none				1
<i>Mesembryanthemum crystallinum</i>	Common iceplant	annual	herb	non-native	moderate		1		
<i>Nicotiana glauca</i>	Tree tobacco	perennial	tree/shrub	non-native	moderate	3a	3a	1	
<i>Pseudognaphalium biolettii</i>	Two-color rabbit-tobacco	perennial	herb	native	none	1	1		
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	annual	herb	non-native	none		2		
<i>Salsola tragus</i>	Russianthistle	annual	herb	non-native	limited	2	2	1	
<i>Salvia mellifera</i>	Black sage	perennial	herb	native	none		1		
<i>Sisymbrium irio</i>	London rocket	annual	herb	non-native	moderate	2			
<i>Solanum americanum</i>	American black nightshade	annual	herb	native	none		1		
<i>Sonchus oleraceus</i>	Common sowthistle	annual	herb	non-native	none			1	1
<i>Stipa pulchra</i>	Purple needle grass	perennial	grass	native	none	1			2
Estimated Total Average Cover Class						5	5	6	6
Estimated Average Perennial Invasive Cover Class						1	1	1	0

CNPS Relevé Method Class Breakdown

Class 1	<1% cover
Class 2	1-5% cover
Class 3a	5-15% cover
Class 3b	15-25% cover
Class 4	25-50% cover
Class 5	50-75% cover
Class 6	>75% cover

Restored Drainage Channel Mitigation Area Container Plant Survival

Species	Planting Area	Quantity	Percent Survival
<i>Baccharis salicifolia</i>	Overstory	160	30%
<i>Platanus racemosa</i>	Overstory	10	
<i>Salix lasiolepis</i>	Overstory	60	
<i>Iva Haesiana</i>	Understory	50	
<i>Juncus acutus</i>	Understory	50	
<i>Artemisia douglasiana</i>	Transitional	75	
<i>Artemisia palmeri</i>	Transitional	50	
<i>Muhlenbergia rigens</i>	Transitional	50	
<i>Rosa californica</i>	Transitional	20	
<i>Sambucus nigra</i>	Transitional	40	
<i>Artemisia californica</i>	Upland	30	90%
<i>Encelia californica</i>	Upland	40	
<i>Eriogonum fasciculatum</i>	Upland	50	
<i>Baccharis sarothroides</i>	Upland	30	
<i>Malosma laurina</i>	Upland	20	
<i>Rhus integrifolia</i>	Upland	20	
<i>Salvia mellifera</i>	Upland	30	

Restored Drainage Channel Mitigation Area Transect Data Summary

	RT 1	RT 2	RT 3	RT 4	
Native	33	38	38	42	
Non-Native	0	0	2	2	
Non-Native Perennial	0	0	0	0	
Non-Native Annual	0	0	1	2	
Bare	16	11	8	5	
					Average Cover
Total Native Cover	0.673	0.776	0.792	0.857	0.7744
Total Non-Native Cover	0.000	0.000	0.042	0.041	0.0206
Perennial Invasive Cover	0.000	0.000	0.000	0.000	0.0000
Annual Invasive Cover	0.000	0.000	0.021	0.041	0.0154

NOTE: Percent cover is a measurement of vegetative cover within a given study area. It is not a proportion of species occurrence. Multiple individuals of one species may be observed within one transect point but will only be counted as one native or non-native hit when calculating cover estimates.

Restored Drainage Channel Mitigation Area Transect Data

Scientific Name	Common Name	Life	Form	Native	Cal-IPC	RT 1	RT 2	RT 3	RT 4	Average	Average %
<i>Stipa pulchra</i>	Purple needle grass	perennial	grass	native	none	2	23	16	18	14.75	59%
<i>Acmispon glaber</i>	Deerweed	perennial	shrub	native	none		1			1.00	1%
<i>Ambrosia psilostachya</i>	Ragweed	perennial	herb	native	none		6	8	5	6.33	19%
<i>Artemisia californica</i>	California sagebrush	perennial	shrub	native	none	3	4			3.50	7%
<i>Artemisia douglasiana</i>	California mugwort	perennial	herb	native	none				4	4.00	4%
<i>Artemisia palmeri</i>	San dDiego sagewort	perennial	shrub	native	none	2	4		1	2.33	7%
<i>Baccharis salicifolia</i>	Mule fat	perennial	shrub	native	none	8		12	8	9.33	28%
<i>Bahiopsis laciniata</i>	San Diego county viguiera	perennial	shrub	native	none	2		2		2.00	4%
<i>Datura wrightii</i>	Jimsonweed	perennial	herb	native	none	1				1.00	1%
<i>Deinandra fasciculata</i>	Clustered tarweed	annual	herb	native	none	10	2	7	12	7.75	31%
<i>Erigeron canadensis</i>	Canada horseweed	annual	herb	native	none	1	1			1.00	2%
<i>Eschscholzia californica</i>	California poppy	annual	herb	native	none	6	3			4.50	9%
Iceplant sp.	Iceplant	annual	herb	non-native	moderate			1		1.00	1%
<i>Isocoma menziesii</i>	Menzies' goldenbush	perennial	shrub	native	none	2	7	1	3	3.25	13%
<i>Iva hayesiana</i>	San Diego marsh elder	perennial	herb	native	none		1		1	1.00	2%
<i>Juncus acutus</i>	Spiny rush	perennial	herb	native	none				1	1.00	1%
<i>Lasthenia californica</i>	California goldfields	annual	herb	native	none			2	2	2.00	4%
<i>Lupinus succulentus</i>	Arroyo lupine	annual	herb	native	none				1	1.00	1%
<i>Melilotus indicus</i>	Annual yellow sweetclover	annual	herb	non-native	none				1	1.00	1%
<i>Muhlenbergia rigens</i>	Deergrass	perennial	grass	native	none	2	1	2		1.67	5%
<i>Pseudognaphalium luteoalbum</i>	Jersey cudweed	annual	herb	non-native	none		1	3		2.00	4%
<i>Sambucus nigra ssp. caerulea</i>	Blue elderberry	perennial	shrub	native	none		3			3.00	3%
<i>Sonchus asper ssp. Asper</i>	Prickly sow thistle	annual	herb	non-native	none			1		1.00	1%
Bare	bare	bare	bare	bare	none	16	11	8	5	10.00	40%

Upland Mitigation Area Container Plant Survival

Species	Quantity	Percent Survival
<i>Artemisia californica</i>	515	70%
<i>Encelia californica</i>	206	
<i>Eriogonum fasciculatum</i>	618	
<i>Baccharis sarothroides</i>	227	
<i>Salvia mellifera</i>	247	
<i>Salvia apiana</i>	206	
<i>Malosma laurina</i>	82	
<i>Rhus integrifolia</i>	82	
<i>Acmispon glaber</i>	164	
<i>Corethrogyne filaginifolia</i> var. <i>filaginifolia</i>	164	
<i>Stipa pulchra</i>	164	

Upland Mitigation Area Transect Data

Scientific Name	Common Name	Life	Form	Native	Cal-IPC	UT 1	UT 2	UT 3	UT 4	UT 5	UT 6	Avg	Avg %
<i>Bahiopsis laciniata</i>	San Diego county viguiera	perennial	shrub	native	none	9	21	34	25	23	12	20.67	83%
<i>Acmispon glaber</i>	Deerweed	perennial	shrub	native	none						1	1.00	1%
<i>Artemisia californica</i>	California sagebrush	perennial	shrub	native	none	10			2			6.00	8%
<i>Baccharis salicifolia</i>	Mule fat	perennial	shrub	native	none	4			1			2.50	3%
<i>Calystegia macrostegia</i>	Island morning glory	perennial	herb/vine	native	none					2		2.00	1%
<i>Chenopodium murale</i>	Nettle leaf goosefoot	annual	herb	non-native	none					1		1.00	1%
<i>Datura wrightii</i>	Jimsonweed	perennial	herb	native	none			1				1.00	1%
<i>Encelia californica</i>	Bush sunflower	perennial	shrub	native	none				7		6	6.50	9%
<i>Erigeron canadensis</i>	Canada horseweed	annual	herb	native	none	1						1.00	1%
<i>Eriogonum fasciculatum</i>	California buckwheat	perennial	shrub	native	none		1			1	1	1.00	2%
<i>Eschscholzia californica</i>	California poppy	annual	herb	native	none	4	3	1			5	3.25	9%
<i>Festuca myuros</i>	Rattail sixweeks grass	annual	grass	non-native	moderate	1						1.00	1%
<i>Glebionis coronaria</i>	Crown daisy	annual	herb	non-native	moderate	1						1.00	1%
<i>Isocoma menziesii</i>	Menzies' goldenbush	perennial	shrub	native	none					2		2.00	1%
<i>Lasthenia californica</i>	California goldfields	annual	herb	native	none			10			5	7.50	10%
<i>Lasthenia gracilis</i>	Needle goldfields	annual	herb	native	none				3	8		5.50	7%
<i>Lupinus succulentus</i>	Arroyo lupine	annual	herb	native	none				1			1.00	1%
<i>Malosma laurina</i>	Laurel sumac	perennial	tree/shru	native	none						2	2.00	1%
<i>Malva parviflora</i>	Cheeseweed mallow	annual	herb	non-native	none					1		1.00	1%
<i>Melilotus indicus</i>	Annual yellow sweetclover	annual	herb	non-native	none		1	5	2		1	2.25	6%
<i>Nicotiana glauca</i>	Tree tobacco	perennial	tree/shru	non-native	moderate	1						1.00	1%
<i>Polygonum aviculare</i>	Prostrate knotweed	annual	herb	non-native	none				1			1.00	1%
<i>Pseudognaphalium californicum</i>	Ladies' tobacco	annual	herb	native	none					1		1.00	1%
<i>Salvia apiana</i>	White sage	perennial	shrub	native	none	1						1.00	1%
<i>Salvia mellifera</i>	Black sage	perennial	herb	native	none			1		2		1.50	2%
<i>Sonchus oleraceus</i>	Common sowthistle	annual	herb	non-native	none			1		2	2	1.67	3%
<i>Stipa pulchra</i>	Purple needle grass	perennial	grass	native	none	5	10	2	7	14	3	6.83	27%
Bare	bare	bare	bare	bare	none	9	21	5	6	2		8.60	29%

Upland Mitigation Area Transect Data Summary

	UT 1	UT2	UT3	UT 4	UT 5	UT 6	
Native	30	27	44	43	46	32	
Non-Native	3	1	6	3	4	3	
Non-Native Perennial	1	0	0	0	0	0	
Non-Native Annual	2	1	6	3	4	3	
Bare	12	21	2	6	2	14	
							Average Cover
Total Native Cover	0.667	0.551	0.846	0.827	0.885	0.653	0.738
Total Non-Native Cover	0.067	0.020	0.115	0.058	0.077	0.061	0.066
Perennial Non-Native Cover	0.022	0.000	0.000	0.000	0.000	0.000	0.004
Annual Non-Native Cover	0.044	0.020	0.115	0.058	0.077	0.061	0.063

NOTE: Percent cover is a measurement of vegetative cover within a given study area. It is not a proportion of species occurrence. Multiple individuals of one species may be observed within one transect point but will only be counted as one native or non-native hit when calculating cover estimates.